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Ennovate

VOLUME 4, ISSUE 13 NOVEMBER 2016

SPECIAL POINTS OF INTEREST:

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"You can have brilliant ideas, but if you can't get them across, your ideas won't get you anywhere.."

--Lee Iacocca

Message from the Vice Chancellor

I am happy to note that the National Centre for Innovation in Distance Education (NCIDE) is publishing *'ennovate'* eNewsletter. The eNewsletter has been playing an active role in the sharing and dissemination of innovative ideas and best practices in the field of distance education through various relevant and interesting articles.

The eNewsletter has emerged as a useful platform for sharing of information, undertaking analysis and reflection on new developments in the field of distance education and it is my hope it will continue doing so in future also. This will facilitate the educators and innovators to exchange ideas and their applications in the field of distance education.

I congratulate NCIDE for publishing the eNewsletter.

- Prof. Ravindra Kumar
Vice Chancellor, IGNOU

Message from the Director

As you are aware, I have recently joined National Centre for Innovations in Distance Education (NCIDE) as Director. I am quite excited to have the privileged opportunity to lead this Centre – a position I will take on with the utmost responsibility and dedication. NCIDE is actively involved in promoting, supporting, re-engineering and disseminating innovations in Open and Distance Learning (ODL) system. The newsletter brought out by NCIDE has evolved as a link between the innovators in distance education and the distance education fraternity at large. The aim of the Newsletter is to provide the readership with useful information and an important means of communications for all educators and teachers.

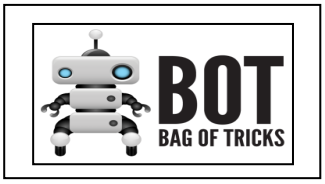
I would like to take this opportunity to invite you to continue to connect with other members of the distance education community by sharing your innovative initiatives and best practices.

Looking forward to hear from you and learn of new innovative developments for our upcoming issues. Your valuable comments, feedback, and ideas are always welcome.

- Prof. Manoj Kulshrestha
Director, NCIDE

Software Robot: Ubiquitous Applications in the Online World

Introduction



The Software Robots, popularly known as bots, are usually third party applications which are controlled using HTTPS requests. Written in JavaScript, the bots can run inside a browser. While as a standalone programme, the bots can run on a local computer or a host server (https://core.telegram.org/bots). The bots rely on a bunch of APIs (Application Programme Interface) to integrate with various systems and, thus to function in a natural way. The bots usually accept conversational format of requests to help the users in automating various tasks performed online. The bots can be given a separate personality other than the user. The bots are being used by major social media sites like Facebook, Twitter, Google, LinkedIn, reddit, etc.

Functions of Bots

The bots are used to perform different activities in an online environment. They help the users in different ways by providing updated information on certain topics or helping them in searching for the relevant information. Broadly, the bots can perform the following functions:

Sending notifications and news feeds: The bots can be used to send standard and customised notifications, and news items like RSS feeds. They can broadcast the information as soon as it is published on the platform.

Integrating with other sites: The bots can be used to integrate with third party information sources. The chat sites are now-a-days using bots for integration of external services and providing the content in the chat window of the user itself.

Customizing different tools: The bots can be used to produce cutomised services like sending alerts, weather forecasts and other services which need to generate frequent updates. The online messenger websites use bots to send stickers.

Developing games: The bots prove to be very useful in impersonating as virtual opponents in online games. They can play chess as against a human player and also host quizzes as virtual avatars.

Providing Social media services: The bots can automatically render their services to the people who are seeking partners for conversation on certain topics with common interests or inclination. Intelligent bots provide suggestions to their partners in areas of their interest based on analysis of their viewing history.

Acting virtually: The bots can be made to automate the processes which can be handled virtually on the cloud. Online gaming and eBusiness sites use bots to handle individual requests and provide

customised services based on past history of the clients.

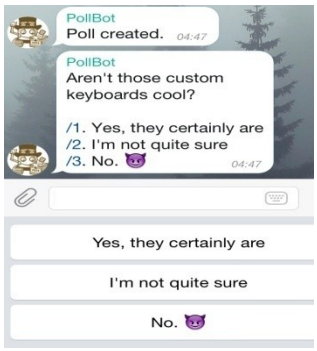
Connecting the Bots

In order to make the bots function and provide the desired information, the users need to connect to them through their user IDs. The users can establish communication with the bots in the following ways:

- By starting chat with the bot and sending request message in the form of commands. In this format, the message can be sent directly to the bots username ID. Alternatively, the username of the bot can be added to the chat group from where it can automatically receive the communication, request, or command.
- By directly typing the bot's username and a query from the input field. In this case, the content can be received directly into the chat. In case, the Bot's username is part of the group, the content will be sent to the group members automatically.

The bots do not register any online status or timestamp. For the purpose of identification, the interface is labeled with the name 'bot'. Since the bots are automated processes, they have limited storage capacity and old requests and commands are deleted once they are processed, and the information, as requested, is passed on to the client. The bots are meant to receive command and act as per the request made through that command. Therefore, the bots do not initiate interaction *suo moto* with the users. However, once the message is received by them, the process as programmed is completed. The usernames of the bots end with a suffix 'Bot' or 'bot', for example, @GitHub_bot, @TriviaBot, etc. The bots follow a user-friendly privacy policy and consequently do not process all the messages and requests received from the group by default.

Inline Bots



An input query made with the help of a chat window is called *'inline query'* when it is straightaway entered in the input field area of a chat. In this case the query is started with the username of the *'Bot'* followed by the text of the query. The Bot username preceded by *'@'* invokes the interaction between the application and the user. The application returns some results and the moment one of the results is clicked, the bot sends the best suitable response options into the currently active chat box, for example - @cricket, @news, etc. In order to enable the users to enter the input manually, a customized keyboard is provided by the bot which helps in making the user interaction simple. However, in order to provide customized information to the user, a Bot may require the user to provide location, mobile number, bank account number, email ID, ticket PNR number, etc., which can be entered with the help of this keyboard. (Though, these personal details should be shared over the internet very cautiously). In another situation, a user may select one of the given options in order to get the desired

information. A bot created for conducting opinion poll is an example of this sort of bots. However, whenever a command is sent to the bot, the same is prefixed with '/' which enables the application to understand the commencement of a command.

The modern instant messengers rely on sophisticated and meticulous abilities of bots heavily in handling online activities with precision. The Telegraph Messenger handles the process of sending requests and commands with the help of a simple HTTPS interface similar to Telegram API which is called 'Bot API'. This Telegram API takes care of the all communications and their encryption on an intermediary server. Subsequently, these requests and commands are forwarded to the software running on the server of the provider (**https://core.telegram.org/bots**).

Privacy Mode of Bots

A user sends a command/request to a bot whenever there is a query and the same is prefixed with relevant special characters. However, when a Bot username is added to a group, all the messages in a routine are received by the bot just like other members of the group. In such a scenario, the Bot in the group is not able to distinguish between the command to be executed and general discussion to be ignored. The Privacy Mode helps the bot in using the available resources judiciously for processing only those commands which are necessarily meant for the bot thereby ignoring the other ones. This feature is pre-activated in all bots by default to be de-activated and activated time and again as per the requirement. In this Mode, the bot does not receive all the messages as commands and filters the same with the following criteria:

- The messages starting with a slash '/' will be taken as commands.
- The messages with name of the Bot preceded by '@' will be processed.
- Message strictly meant for the Bot only, will be received by it.
- The messages related to addition or deletion of members from the group will be received.

Internet Relay Chat Bot (IRC Bot)

The bot that connects with the Internet Relay Chat as a client is named as *'IRC Bot'*. It is again a script based independent programme which is visible to IRC users as another user and performs functions already programmed. The IRC bots can provide special services such as providing access to large databases, managing list of users and managing the flow of information on behalf of the actual user (https://en.wikipedia.org/wiki/IRC_bot). The IRC bot has a special function to perform as an independent programme running on a stable server. It keeps surveillance on the malicious intruders and prevents taking over of the channel by them. However, it respects the special permissions given to the users for seeking information. The IRC bot can maintain the log file on the activities happening on the IRC channel. At times the IRC bots are deployed on the global host to oversee, in the background, the communications happening live. In such a situation, the bots keep an eye on the text being exchanged and provide additional information on certain phrases based on

pattern matching the current topic which could help the new users of the chat. In other case, they can automatically censor the undesired content or profane language used by the clients.

Internet Bot

The Internet Bot is an application containing a set of automated task scripts deployed over the internet popularly known as web robot, www robot. These bots are deployed for repetitive functions to be carried out at a speed faster than a human being. The *'web spidering'* is claimed to be processing largest volume of repetitive actions such as providing, analysing and storing information from different web servers. They can be deployed on the internet to impersonate a human being. Their capacity to speedily send automated messages at times has been used for manipulation by their creators. It may also be difficult to identify as to whether the user interacting from the other side is a human being. With the negative intention, the user can make use of bots for overwhelming the chat with discussion on certain topic and this way the real topic is drowned and, thus subsided. They are capable of changing the information, confusing the users by sending multiple versions of same information and distracting them from the main issue. These robotic apps (Internet bots) are easy to develop and implement, but have the potential of influencing every activity on the Internet negatively or positively.

Malicious use of Bots

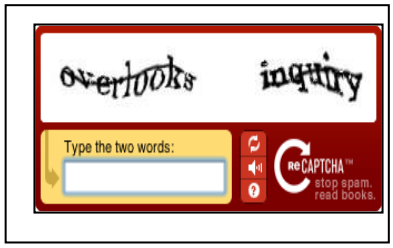
The ticket brokers use the bots for capturing premium seats in a concert by deploying such programmes against the ticketing sites of such events. Similarly, these applications can be used to enhance the views/hits on the social media sites or increase traffic on a site for analytical purposes. The Bot can be misused to create spam, automatic attack on networked computers and bombard a particular website to get crashed (https://en.wikipedia.org/wiki/Internet_bot). The following are the examples of malicious use of bots:

- **SpamBots:** These bots are capable of creating spam emails at a fast speed. The bot captures the email IDs of different users from contacts, address books and guestbook pages and sends spam to them.
- **Downloaders:** These APIs start download of the entire website without information of the user and, thus suck whole bandwidth and force the system to hang.
- **Website Scrapters:** These programmes copy the content from other websites in a big way and use the same without knowledge of the creator on the automatically generated doorway pages. The doorway pages are the web pages which insert the results for a particular phrase to the index of a search engine to malign the search results and direct a visitor to a different page.
- **Viruses and malwares:** These are auto- installable programmes which multiply exponentially once auto-installed on a host. They control the software applications and malign their functioning. Some of the Viruses lead to destruction of the data in different way and even

formatting of hard disk.

- **Zombie computer:** It is a computer controlled by a hacker with the help of execution of remote applications, virus or a Trojan horse. It is used by the mischief mongers as platform to perform malicious tasks remotely on different networks.
- **Botnet:** It is a network of computers automatically communicating with similar machines over the internet. The bots communicate and coordinate the activities happening over the internet by 'command' and 'control' and passing the similar 'command' and 'control' messages to other similar computer networks (https://en.wikipedia.org/wiki/Botnet). The system is used for negative and malicious tasks. The hackers are able to create a Botnet of Zombie computers to perform sophisticated malicious tasks.
- **Distributed Attack:** The complete name of the distributed attack is *'Distributed Denial of Service'* (DDoS). The situation of *'denial of services'* occurs when multiple compromised computers or Zombie computers or Botnets generate huge traffic of messages targeted to single system so much so that the system goes out of its capacity to perform. When the target server is already busy with the requests already queued, it can no longer accept the fresh requests and, thus leads to system crash (https://en.wikipedia.org/wiki/Denial-of-service_attack#Distributed_attack).

***CAPTCHA* Coding**



The bots are able to impersonate a human being to capture information unauthorizedly from an online source. However, use of the *CAPTCHA* Cods help preventing this type of misuse in the cyber space. The *CAPTCHA* is a term used for *'Completely Automated Public Turing Test to Tell Computers and Humans Apart'* which was devised by Luis von Ahn, Manuel Blum, Nicholas Hopper and John Langford in the year 2000. The *CAPTCHA* coding is *'easy for humans and tough for Bots'* and thus, provides security from data theft. It contains the distorted text in the form of image which cannot be recognised by a machine, and only humans are capable of reading such imaged text. The *CAPTCHA* script makes the user copy the text from the distorted image to the space provided, in order to get access to the information. Alternatively, the CAPTCHA script may ask the users to compare or click the relevant image from the given images to ensure that the user is a human being. (https://www.google.com/recaptcha/intro/index.html). It permits the human beings to use the information and prevents spam and, thus protects important data from abuse on the internet.

Future of Bots

On the positive note, the bots have become ubiquitous on the internet, and this trend may grow further in the times to come. It may acquire more and more features with automation of tasks and

making repetitive tasks easier with value addition. The software robots are getting more and more intelligent day by day, and may handle challenges pertaining to language recognition close to satisfaction of the users. On the Internet, the bots may be a better way to provide instant information to the users in a customised and personal way. At personal level the individuals may have their own bots to perform their repetitive tasks making the life easy on the *'Internet of Things'* -which is a new phenomenon in the internet age – by making human interface to so many connected devices easy.

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Taxi Ride-Sharing Concept: Is It An Example of Disruptive Innovation?

In recent years, you might have seen a kind of revolution in hiring taxies all over the world, particularly in the metro cities. Now, you can simply download an app, on your mobile, related to a particular taxi service and using that app you can call the nearest available taxi. You will find the taxi at your door step within minutes. These taxies are not only cheaper, but they are more secure and safe as compared to the traditional taxies as these taxies are fitted with GPS navigation and tracking system, and are controlled & monitored by a centralized monitoring system. Today this innovative scheme of ride-sharing is commonly understood as a dynamic platform on which driver partners with the companies, and the passengers are matched in order to reach a destination.

With the increasing rise in the use of such taxies, there is also an increasing threat to the sustainability of the traditional taxi services. In fact, many a times, the traditional taxi owners' associations have come out openly opposing these app base taxi services like *Uber*, *Ola* etc. This value addition in taxi services with a difference is certainly an innovation. This kind of innovation which on one hand creates a new market and a value network, and at the other hand eventually disrupts an existing market and the value network, displacing the established market leaders and alliances, is called a disruptive innovation. The term disruptive innovation was first defined by Clayton M. Christensen of Harvard Business School in 1995. In his book 'The Inventor's Dilemma', Mr. Christensen used the term to describe innovations. The term disruptive innovation, coined by Clayton Christensen, describes a process by which a product or service takes root initially in simple applications at the bottom of a market and then persistently moves up market, and eventually displaces the established competitors. In fact by way of adding new values in the service and product, the disruptive innovations should discover new categories of customers and create new

markets for that service or product. Many a times it is done by developing new business models and by exploiting old technologies in new ways. It is important to mention here that Mr. Christensen contrasted disruptive innovation with sustaining innovation, which simply improves the existing products and process.

Before we discuss if the tax-ride-sharing scheme is a disruptive innovation or not, let us review what we mean by the innovation. Normally, an innovation is defined as any new idea which generates value. Where 'value' refers to any significant improvement in a process, product or service. Such innovations are called 'incremental innovation'. Let us come back to the concept of ride-sharing taxi services and see how it is an innovation. The innovative features of the taxi-ride sharing services can be summarized as follows:

- This new taxi ride-sharing service helps in connecting the taxi passengers to drivers through a smart phone app.
- The passengers can match their routes using technology and hence give them an opportunity to share their rides with whom they are comfortable.
- It also makes a passenger to pay lesser and the taxi is fully utilized. In turn there are lesser taxies on roads.
- It has proved to be an effective alternative to the unreliable and high cost local taxi monopolies.
- This GPS enabled network of taxis has reduced pick up time attracting more passengers leading to more business thus attracting more drivers and hence generating more employment opportunities as taxi drivers.

Another innovative feature of the Taxi Ride-Sharing concept is that it has led to a number of startups also like RidingO, Poolcircle, Orahi, Poolmyride, sRide and Let's Drive Along, etc. introducing a new concept of transportation that is more affordable, accessible and environment friendly. These start ups have come up with innovative technologies to address the security issues of the passengers. It is believed that the ride-sharing concept may scale up to address spontaneous demands of the taxi riders.

Evidently, this kind of innovative taxi ride-sharing concept has brought consumer friendly changes in the taxi services. It has got innovative solutions to a number of unsolved problems the users faced while using the traditional taxi services. These problems include security and safety of passengers, arrogance and impoliteness of drivers, cheating of the passengers, over charging, not in time services, etc. Undoubtedly, the innovative concept of ride-sharing taxi services has given solution to number of such problems and issues of the users, and at the same time it has created new job opportunities and has helped in organizing the taxi service sector.

But it is interesting to mention here that the taxi ride-sharing concept is being considered an example of disruptive innovation as it has generated feverish disruption in the field of taxi services

all over the world [1]. Now the question is whether taxi ride-sharing concept is a disruptive innovation or not? Before finding answer to this question, let us first see in which situations an innovation can be considered as a disruptive innovation. According to Christensen [2], there are basically the following criterions to call an innovation as disruptive innovation:

1. Firstly the innovation must gain a foothold in a low-end market that had been ignored by the incumbent in favor of more profitable customers. Otherwise, the disruptor must create an entirely new market, turning non-customers into customers.
2. Secondly, it should target people who already use that service or product, and it doesn't provide a particularly lower-end or cheap experience.
3. Thirdly, a truly disruptive innovation should begin with low-quality offerings, and then eventually capture the mainstream market by improving quality.

Now, if we try to match the characteristics of the taxi ride-sharing scheme on the above mentioned criterion of disruptive innovation, we find that this doesn't fit into either of the first two criterions as it targets mainly those people who already use taxi services, and it doesn't provide a particularly lower-end or cheap experience. We have to find out whether it has created entirely new market and new customers?

Secondly, though it has begun with quality offerings and has disrupted the traditional taxi service system, but has it actually made or is going to make the traditional taxi services obsolete? It is true that the traditional taxi service providers are forced to think innovatively and find new and better business models to compete with this new model of taxi services. It is also learnt that the taxi-ride-sharing service providers have started to use unfair tactics against both its rivals and critics. Moreover, the recent unhealthy incidences of abusing, cheating and harassing the passenger by these taxies have also put question mark on considering this as a disruptive innovation. You can also put your views in this context.

References:

1. Case of disruptive innovation (2016), *The Star Online*, 16 May 2016. Available at: http://www.thestar.com.my/opinion/letters/2016/05/16/case-of-disruptive-innovation/
2. Christensen, Clayton M., Raynor, Michael E. and McDonald, Rory (2015), What is Disruptive Innovation? *Harvard Business Review*, December 2015, pp.44-53.

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Innovationclub@IGNOU

NCIDE has constituted an Innovation Club@IGNOU and it is functional since in April 2015. It has been activated with the approval of the Competent Authority under the directions of Hon'ble President of India as well as the Hon'ble Minister for Human Resources Development, Govt. of India.

The basic objectives of the Innovation Club@IGNOU are as follows :

- to contribute creatively and actively in the innovation related activities of NCIDE,
- to generate awareness about creativity and innovations in the ODL System,
- to identify the grass root level innovations by the faculty and the students of IGNOU as well as the ODL system, and
- to provide the forum to create a network of innovators and inculcate a culture of innovation.

During one and a half years of its existence, the Innovation Club@IGNOU has held several brainstorming meetings, presentations on innovative educational solutions, planned projects proposals to develop prototypes, and set up innovation clubs at a few Regional Centres. At this moment, it is envisioned that the activities of the club would be diversified and expanded in future.

Presently, the club has 30 members and it seeks to have a wider participation of IGNOU fraternity. Therefore, the NCIDE has decided to reconstitute and expand the club and invite the interested IGNOU employees at the HQs to participate as members in the Innovation Club@IGNOU.

NCIDE

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The National Centre for Innovation in Distance Education (NCIDE) was established in December 2005. It is a facility for promoting, supporting, re-engineering and disseminating innovations in Open and Distance Learning (ODL) system. The NCIDE is a ground for nurturing bright and inquisitive minds whose ideas and explorations are expected to revolutionise the ODL system to suit the needs of Gennext. The Centre's goal is to develop a culture of continued search for new and innovative solutions to offer seamless education for all, achieve cost efficiency in its operations and provide borderless access to quality education and training.

We look forward to receiving your suggestions for this e-newsletter. We also welcome your contributions for the future issues. Please send us your emails addressed to the Director, NCIDE at: ncide@ignou.ac.in.