Real- time data of construction projects using google maps and management techniques for data analysis and AI based Chatbot.

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Abstract

Real-time data analysis is a big data trend that will increase substantially and have a big impact in and out of any organisation. Having a lot of data from the initiation to the execution and till completion is one thing, being able to store it, analyse it and visualise it in a real time is a whole new challenge. This paper is about how to put the data of the live construction projects using the google maps or mapbox application and how this data can be store, analyse and used for documentation, business purposes and also analysing the management work during the execution of project using the technology like AI Chatbot. The real time data and management work on the field can be used for education purpose in all the universities all around the world via internet and virtual reality.The GPS coordinates can be used to locate the project details and with the help cloud-based management application and offline approach the other data can be collected and stored on server.

Keywords - Google maps, Mapbox, Construction management,GPS coordinates ,Data analyse, AI Chatbot.

Introduction

Problem Statement - Data of live construction projects is still not available in digital format with no facts and figures. Most of the agencies who is involved in the construction industry faced the problem of data. Hence Data analytics for real-time live projects is not possible because of the lack of data.All the data of live projects or the projects that got started is usually only available at few agencies like Municipal corporation, Development authorities, Public welfare department etc. It also depends on various countries. There are two problem, first public who pay huge taxes is not aware of the development work around their cities, second due to unawareness there is problem of illegal construction and land encroachment. There are many other problems due to lack of live data which can be solved using the smart portal which shows each and every detail using the GPS coordinates. Additional smart tools can be developed and connect with the portal using Mobile application and chatbot powered by artificial intelligence.

Solution statement

The solution to this problem is creating a platform using google map or mapbox and putting all the detail on maps of live construction and execution project, Just like people see Uber cabs on their smartphone they can able to see all the live projects in the same way. They can put the address or zip code and get the status of the projects in that area.

Features

One stop destination via Google Maps or mapbox.

The portal can be designed in the way that, all the projects can be view on maps using the common icons that will indicate the location of the construction area. Since, we need to show the different icons for different projects so the page will reload again by clicking of different icons.
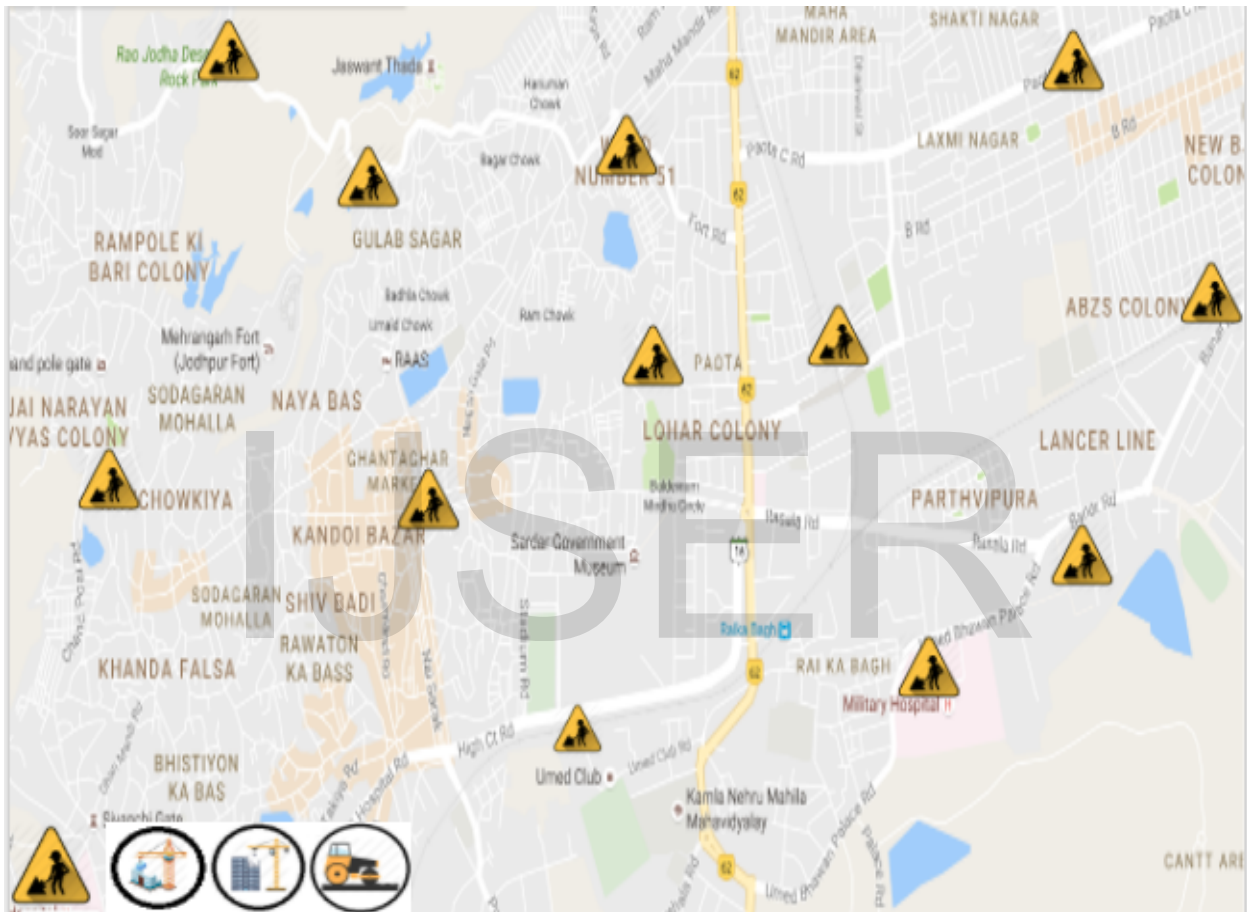

Fig 1.1 All the Icons of Live construction project on Google Maps.

GPS coordinates

The Location of various projects is only possible because of the GPS coordinates. There are several ways to collect the GPS coordinates like using the mobile application. The best one is to use the google maps only. By clicking on the location google maps itself show the location and provide the exact coordinates.

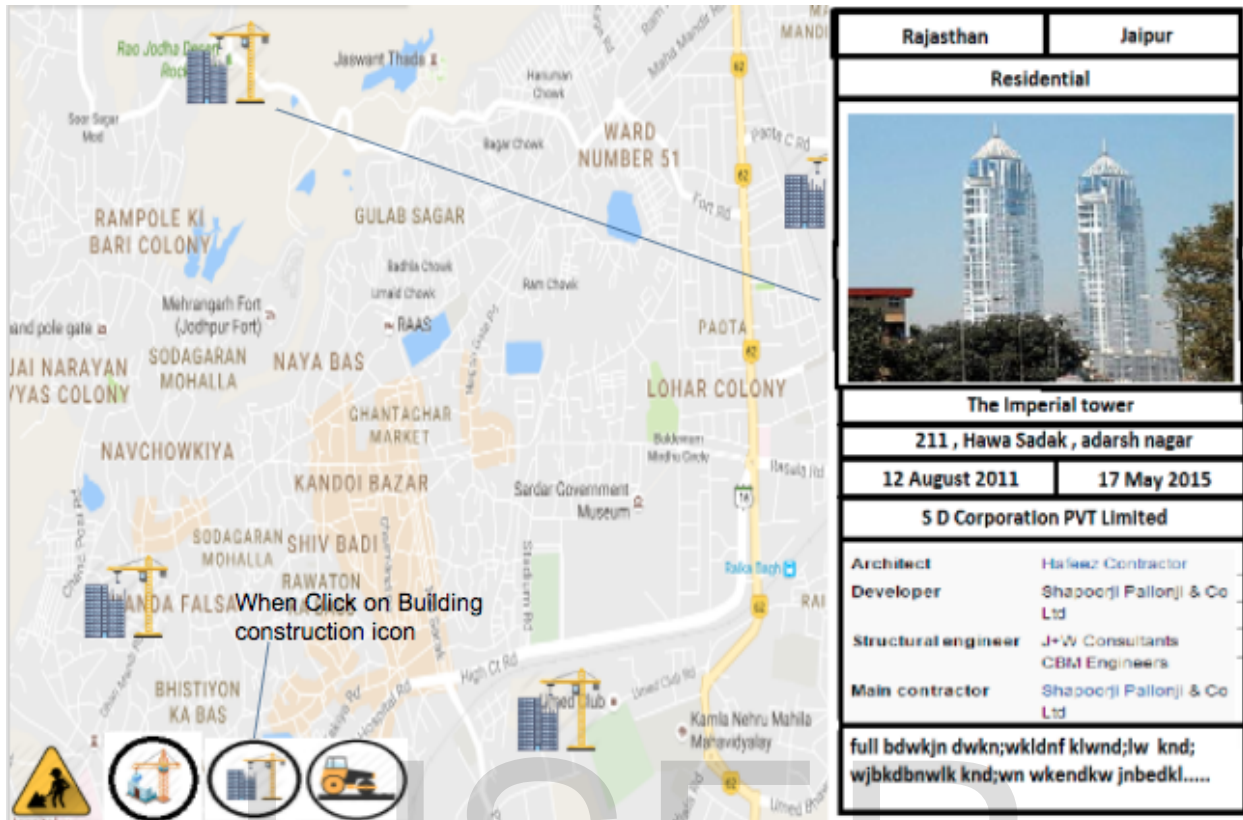**Fig1.2 GPS coordinates via Google Maps**

Fig 1.3 Detail of particular project on just one click

Construction execution update

The data of the current project status can be updated very easily connecting the construction management web and mobile application. The Project detail can be connected directly to the portal using the longitude and latitude as a code to connect, the data which the project team will upload for the particular project can be filtered out by the smart portal and structured data can be shown.

Past, present and future data.

The data of all the past project can also be discovered using this platform. It can be search using data domain. The user can put the dates and according to that data can be displayed of all the past project. This portal can also be use to show the future opportunities and project proposal in every region. This will help the user to see the various opportunities in the any region.

Environmental - Carbon dioxide emission data.

The data of the Carbon dioxide emission is still not available. This portal will put the approximate detail of the carbon dioxide emission by calculating the amount of concrete used in the project. With the quantity of the concrete , it is very easy to calculate the emission of Carbon

dioxide and other gases. These emission data will be helpful to deal the environmental problems faced by that area and appropriate action can be taken by the various organisation.

Live project special zip-code(GPS Coordinate based)
There are various projects which are located in the forest or a village where the address is not available. So the special zip-code can be locate to those construction site and anyone who want to visit the side can use that special zip-code to reach to the exact location. The zip-code will be generated by the portal itself using the GPS coordinates and will compact into the new code, which can be used to identify the project location.

Alert on Encroachment
There can be more innovation and services can be offered to the user . There are many places who faced the problem of land encroachment and other people construction the building without notifying to the owner and it leads to various cases. So the portal will first notify to various authorities like first the owner and with that other institution like municipal corporation, police etc.

Project development design on Maps for educational purposes
The demand for online education is increasing at the very fast rate . There are several field in which online education is still lacking, like APEM(Architecture, Planning, engineering & Management) because of lack of structured data. The portal will put all the details including the architectural drawings so that students and professional can study various details of the projects and put their views . There can be discussion forums can be developed where student can discuss various doubts with the various professional including the architect and designer of particular project.

Educational purposes
Apart from design skills students can learn the management skills and techniques via digital platform. The detail of planning and management can be structured and shared on the different portal for the various universities via their portal to provide online education.

Internship and job opportunity
Lot of people look for the various opportunity to work with the professional and at the same time there is a need of the work force during the execution of the project. There is the huge gap in the recruitment process and this can be solved by collaborating the job portal with particular projects so it will make easy for the professional to look for job via using this platform.

Documentation
Documentation is always a problem in the during the entire project execution and due to lack of project documentation there are other problem occurs like corruption and data analysis. The documentation will also help the public to see any kind of development work.

Real-time data of project via construction managements

The project management and planning has always been a big problem faced by the projects and all the management detail can be put on the project portal . These management and planning data can be used by various professional for study purpose . For example , If a Civil Engineer or Architects graduate want to analyse the planning and execution process in detail of project executing in Dubai and he/she is based out in India .They can use the platform to study the various process and hence it can become the great education platform for both skilled and unskilled people.

Advantages of Real-Time Big Data Analytics in APEC (Architecture,Planning,Engineering and construction)

The advantages of processing Big Data in real-time in Construction industry are many:

Errors within the system, organisation and projects are known instantly.

The Architectural details like 2D, 3D plans, structural design of the project can be check, analyse and verified by the development and municipal authorities very easily and strict action can be taken in case if the technical details are not as per norms and standards.

Companies can analyse the data on the map and analyse the various details such as location, near by resources,to do the planning of the projects also using the digital map details it can verified the amount of traffic. This can help the companies to to better planning towards logistic part of the projects. Real-time insight into errors will help companies react quickly to mitigate the effects of an execution problem in the ongoing projects . This can save the projects from falling behind or failing completely or it can save many new customers(In case of real estate project) to look for different companies.

New strategies of your competition are noticed immediately.

With Real-Time Big Data Analytics on the google maps.One can stay one step ahead of the competition or get notified the moment of other direct competitor is changing strategy and speed. Various state governments can also analyse the details of the other state's work development, hence can take valuable actions to pursue new projects. In case of real estate the builders can check with the details of the new upcoming projects and costing of various flats units.

Service improves dramatically, which could lead to higher conversion rate and extra revenue.

When organisations monitor the projects that are executed by the team, it can pro-actively respond to upcoming problems. For example,If there is any architecture fault in the design those details can be improve immediately and new design can be implemented, Also providing the real-time update of the project to the customers can increase the rates of booking and also on professional level it will build trust and hence more projects can be launch.

Fraud can be detected the moment it happens and proper measures can be taken to limit the damage.

The financial world is very attractive for criminals. With a real-time safeguard system, attempts to hack into your organisation are notified instantly. Your IT security department can take immediately appropriate action.

Cost savings

The implementation of a Real-Time Big Data Analytics tools may be expensive, it will eventually save a lot of money. There is no waiting time for business leaders and in-memory databases (useful for real-time analytics) also reduce the burden on a company's overall IT landscape, freeing up resources previously devoted to responding to requests for reports.

Better sales insights, which could lead to additional revenue.

Real-time analytics tell exactly how your sales are doing and in case an internet retailer sees that a product is doing extremely well, it can take action to prevent missing out or losing revenue.

Keep up with customer trends

 Insight into competitive offerings, promotions or your customer movements provides valuable information regarding coming and going customer trends. Faster decisions can be made with real-time analytics that better suit the (current) customer.

Integration of construction management with Artificial Intelligence.

In the competitive nature of construction, industry and its heuristic problem-solving needs, among other reasons, have contributed to the development of some advanced decision-making tools. Research in artificial intelligence (AI), a branch of computer science, has provided more suitable tools to the construction industry. Since its initial development, the Artificial Intelligence has found large applicability in the field of engineering. In particular, the so-called soft computing methods have been shown to be very effective in the analysis and solution of construction engineering problems. However, the performance of these systems during the last decade is far from ideal.

The AI Chatbot for construction projects

A chatterbot is a computer program which conducts a conversation via auditory or textual methods. Such programs are often designed to convincingly simulate how a human would behave as a conversational partner, thereby passing the Turing test. Chatterbots are typically used in dialog systems for various practical purposes including customer service or information acquisition. Some chatterbots use sophisticated natural language processing systems, but many simpler systems scan for keywords within the input, then pull a reply with the most matching keywords, or the most similar wording pattern, from a database.Chatterbots that use artificial intelligence, understands language, not just commands, and continuously gets smarter as it learns from conversations it has with people.

The AI chatbot can be design in two ways one using the set of rules and second by using the artificial intelligent techniques . These chatbot can be used by various professionals in the industry check updates, details about the needs and requirements.
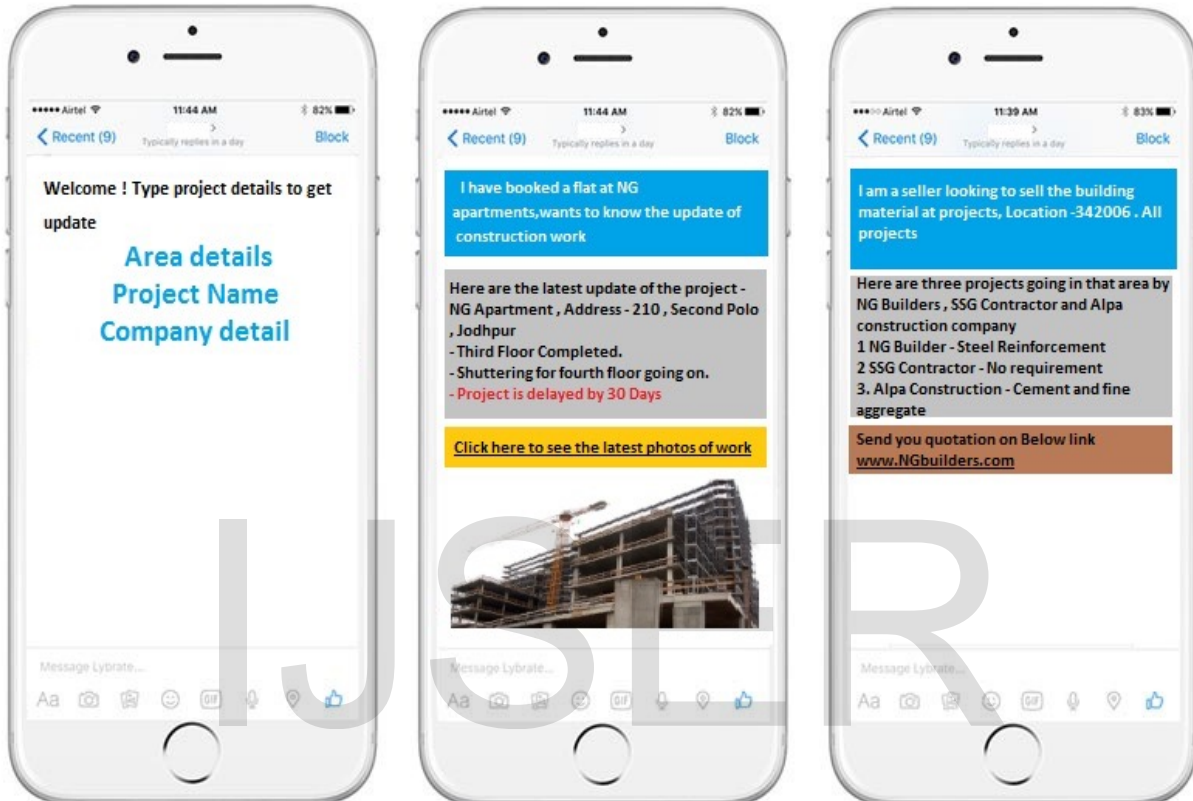

Fig1.4 Sample Images of AI chatbot for getting the data of the project work.

Challenges of Real-Time Big Data Analytics

Of course, Real-Time Big Data Analytics is not only positive as it also offers some challenges.

It requires special computer power:

The standard version of Hadoop is, at the moment, not yet suitable for real-time analysis. New tools need to be bought and used. There are however quite some tools available to do the job and Hadoop will be able to process data in real-time in the future.

Using real-time insights requires a different way of working within your organisation

If your organisation normally only receives insights once a week, which is very common in a lot of organisations, receiving these insights every second will require a different approach and way of working. Insights require action and instead of acting on a weekly basis this action is now in real-time required. This will have an affect on the culture. The objective should be to make your organisation an information-centric organisation.

Conclusion

This paper has described and discussed some ways to think about Live project analyses of Past , present and future, Also the features that were described will give the other added advantages to the construction industry and people. The Technology like real time data update and real time data analyses will help various institution to maintain the transparency. The development of this portal will help the both urban and rural area to be more inclusive, productive , safe , resilient and sustainable. The emerging technology like artificial intelligence and data technology will help to develop the new application that can used by various people to get the detail and data. The development of the virtual education system.

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