A Review article on Embedded System based Robotics Controlled Judiciary Library

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Abstract

The advent of Internet of Things (IoT) technology about two decades ago has started making lives of people smarter and more productive, in spite of this, the technology is in its initial stage and can be utilized to a great extent in numerous applications. One of the applications of IoT is in Judiciary. This review article deals with the application of IoT technology in the field of law. Few applications of IoT in the Judiciary include superior analytics, better evidence and its presentation, and optimized and easy court processes that can enhance processes, eliminate excessive procedures and prolonged time and mitigate corruption. Using IoT in Judiciary, e-library at different court levels can be created and the petitioners can access the status of the cases at any time. Also, IoT-based Embedded Systems can also be used to keep track of criminals providing real-time live updates. Judicial sector can become even smarter using IoT, a major requirement in developing countries like India.

Keywords: Embedded Systems, Internet of Things, Judiciary, law affairs.

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INTRODUCTION

In the last two decades,, scholars, practitioners, policymakers, administrators and executives have realized that there is a possibility that Artificial Intelligence (AI) might bring revolutionary changes in the functioning of courts and specifically judicial decision-making.[1-4] There have been a lot of debates on the architecture and successful execution of AI based system of courts[Figure 1].It has also been discussed that such systems can assist judges' decision-making and prove a better alternative for common petitioners in their persuit of justice.[5] In Judiciary, role of technology has been provoked and condemned.[6,7] Further, it has been realised that technology makes data analysis easy with great accuracy and precision in various fields. This review article analyses the interactions between law and technology with least human intervention.[8-12]

In many courtrooms, library for law books is not very rich. For those legal practitioners, who want to refer to any book or domestic or International case law, it will prove to be a boon.[13]

It was observed during the pandemic era of COVID-19 when most of the countries were facing severe conditions of lockdown, the importance of artificial Intelligence, specifically, IoTs was observed in various fields and courts were no exception.(Figure 2).[14] In criminal cases as well as civil suites, there are a number of stamps, duties, revenue, etc., and access to the information is still a big challenge in many district courts of India. Petitioners and their relatives have to run after various clerks and Munshis to get the information. Digitization and automation of courts can enhance the transparency and accessibility of such information to the common man even in remote areas.[15,16] This can prove a fruitful step towards reducing corruption and building a smart nation.

The application of digital electronics in the judicial proceedings has led to the evolution of judiciary tools from paper based tools to digital media.[17-19] This evolution has a

Figure 1: Application of IoTs in the field of judiciary

Figure 2: E-court hearing during pandemic[14]

great potency to make the judiciary system of India smarter, hopefully the smartest. The robotic controlled library would automate data entries to official registers, filling procedural documents, and exchanging case-related information. Also, a necessary check is needed to protect judicial data from hackers. Another result of an embedded system based robotic controlled library could be the automatic drafting of summons. This process can shift the agencies performing task from human clerks to non-living machines and systems.[20]

The use of electronics in courts proves to be less subjective and questionable and more objective and transparent as compared to human supervision. The machines are less questionable to accuracy and precision as compared to human work. The execution of a task by machine takes place at a quicker rate with an almost negligible probability of errors.[21-23] Also, the digitization of judiciary libraries makes it possible for judges to take references of similar court cases on which superior courts have already made some verdict.This will make the judiciary system strong, worth relying upon for the petitioners and it will be helpful for creating awareness among people about the consequences of crimes, hence it can help reduce crime rates in the country.[24,25]

Though 21st century has been known for its digitization and popularity, there are few things about which digitisation is often condemned, like signature which is a more convinient option of paper based mode, the identification of lawyers and advocates, AND case parties.[26] At times automation of processes makes lives comfortable and easy, whereas to the contrary, they create chaos and the occurrence of unwanted deeds becomes problematic. Sometimes there are different working styles of different courts and judges, and the uniformity in digitised courts can also create issues in some processes.[27]

Courts and Information Technology

According to Jon McCarthy, who coined the term AI IN 1956, Artificial Intelligence (AI) can be defined as "allowing a machine to behave in such a way that it would be called intelligent if a human being behaved in such a way". A lot of tasks are now being performed by digital assistants like Alexa and Siri. Such digital assistants have become so popular in day to day life and represent the role of Artificial Intelligence and big data analysis in improving the quality of human life.

Administering justice refers to the act of dispensing justice in individual cases. Irrespective of the matter of the subject, the job of courts and judges is processing of information. Different parties bring information to the courts, both civil and criminal. Also, transformations takes place in the course of the procedure including statements of parties,petitioners, convicts, etc., and the outcome is also in the form of information including verdicts, hearing dates etc. At times, default judgements are produced by the courts and there are simple assesments without a hearing. While many cases are resolved by settlements. So a small fraction of cases are left for the Judiciary to resolve whch are complex or condratictory in nature.[28] Also, it is not necessary at all that the process and the necessary information technology used is same for all the cases. The cases and actions taken in response to most cases are quite different.[29,30]

Robotic-based Library for Courts

The use of a robotic-based library for courts can enable easy and quicker procedures of the court. The schematic diagram of which has been depicted in Figure 3. It can be useful in different ways to meet different requirements. It will make courts fairer, unlike human judges. Robotic technology does not get tired. Its energy does not depend on the glucose level. The thing which is challenging in the system is its design which has to be uniform for all the courts and at the same time needs to be task specific for different cases.

Organization of information is the chief task in designing e-libraries. This process includes sorting of documents on the basis of chronology, complexity, nature of the offense, etc. In many courts of the United States of America, eDiscovery is used which is an automated investigation technique for sorting out necessary information from a large amount of available electronic information. The courts in the United Kingdom offer a fast and more accurate method than manual file research. Advisory AI can also prove to be significant for legal professionals. AI seeks important and required information,as well as gives an answer to a problem or query. The user is then free to decide whether he/she wants to take up the advice or not. The advisory function can help in resolving more of their problems on their own and thus, this can help in preventing chaos and even filing of court cases. The advent of embedded system technology into the operating systems of computers, smartphones, computers, ipods, ipads, etc, has made the application of speech-to-
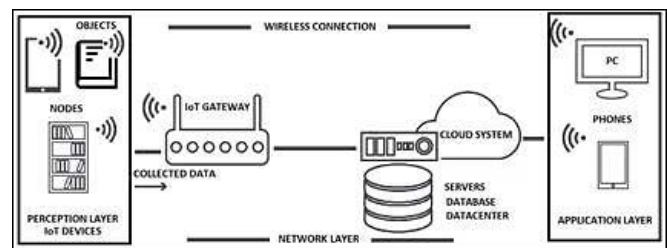

Figure 3: Schematic diagram depicting the design of the robotic-based judiciary library[30]

text aquite ssential example of robotic applications which is already popular in everyday life, as well as in many courts and prosecutors' offices. During the processing of judicial decisions, data security is a major concern, also system needs to be designed in such a way that it is is checked for certification of sources and cannot be altered.It requires secure technological development for its design.[31]

Nowadays e, libraries find many applications in various fields. Embedded systems can be used to build a robotic design and on-demand scanning system that will allow for real-time browsing of printed materials through a web interface. In this system, robot will be able to fetch the requested data. The robot will be able to deliver this data to another robotic system that will provide access to the file as well as it will be able to turn the pages automatically. By using existing hardware devices like scanners, optical character recognition (OCR) software, and indexing software, the system will only allow for browsing of text images and finding and analyzing text generated.

This paper focuses on the enhancement of the accuracy of entire delivery process of the robot system, especially, the book related to law. while future work can be concentrated on developing the robotic system to complete the incompleteness in the processes.

Currently at the Moravia Park this kind of shelving facility is available where, after receiving a request, a library officer at the facility will drive a portable personnel lift to retrieve the requested item to its location, and then bring it to a waiting area for the next scheduled transportation Then, a batch of requested items is transferred to the main library radioactive waste stored in warehouses at Department of Energy facilities.[5]

Conclusions

This article explores what is known about using Embedded Systems, IoTs, AI, Robotic Systems, etc in courts.It also focuses on the need for information technology for court cases which is not the same for all cases. Some Electronic systems have already proven by being in practice in the courts of countries like the United States of America, Netherlands, etc. There is noevidence so far suggesting that robotic technology can itself act as judge. A lot of work is still needed to be done for the application of Artificial Intelligence in the Judiciary. The article also tends to propose the idea of e-libraries for courts in developing countries like India. Though, the country has an amazing judicial system, yet its execution, fair and easy access to the people living in remote areas still remains a big challenge. Use of IoTs in managing judicial libraries at district, city, state and center level can promote a fairer and more convinient option for providing justice to all.

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