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CMS Model Subjective Quality Evaluation VIA Crowdsourcing

Sikander Rahu[1], Ali Ghulam[2], Dr. M. H. Depar[3]
[1, 2. 3]*Information Technology Centre (ITC), SAU, Tandojam*

Abstract: Content management system (CMS) normally serve as an integral part of any organization. Large organizations focus more on CMS optimization to get better results in terms of calculating their effectiveness and assessment in internal working and to consider user/customer satisfaction. The best way to get user satisfaction is to conduct subjective tests of that object. This research paper is based on the development of a CMS called EmpBox for the faculty members of Sindh Agriculture University (SAU) Tandojam and to conduct its subjective tests to get user satisfaction and quality score through crowdsourcing. CMS has been specifically designed to cater the needs of faculty to develop their professional/academic and personal profile, research articles, project details, academic assignments etc. Crowdsourcing for subjective tests have been done by hiring faculty members of SAU who shall be the potential users of this CMS.
There are multiple components of this research which have been achieved and implemented. The first thing which has been achieved is CMS open Source application along with a generic EmpBox model. Secondly, a fully functional prototype of web-based Empbox CMS system. Thereafter, fully functional prototype as we can use online and smarts phones, Along with this developmental work, a subjective study has been conducted to verify the effectiveness and easiness of EmpBox CMS system.
Keywords: Crowdsourcing, QoE, Subjective Test, CMS System, Community Network.

I. PROBLEM STATEMENT

Finding out a method for solving a technical and hard problems, and how to achieve target with minimum time and get better performance. What is exact challenges in CMS System's in Universities, normally different Universities or institute have been hiring crowdsourcing for the finding out a method for solving a technical and hard problems. In this research paper focused Content management system (CMS) normally serve as an integral part of any organization. Normally CMS are optimized to get better results in terms of having extensive and full control over contents and Calculating effectiveness and proper policy implementation assessing internal working of different integral components getting user/customer satisfaction when it comes to SEO implementation. The best way to get user satisfaction is to conduct subjective tests of objects under study, in this case a CMS. However, most of educational institutes in our region do not have CMS based websites rather static or fixed websites. Static or Fixed websites have some limitations: I.) a brochure type site where contents do not change often II.) Contents have to be changed by the web developer III.) Updates can be worked by a person with rudimentary knowledge of html and/or ftp etc.

II. INTRODUCTION

They presented their research for medical clinical trials. In their research, they highlighted important contributions and to get debit comments and also arguments (Ameet Sarpatwari et al, [2]). Provide a proposed CMS application to show a feasible way towards a crowdsource to user subjective testing method for CMS application (Alexander Teinum et al, [1]). Content management system (CMS) normally serve as an integral part of any organization. Finding out a method for solving a technical and hard problems, and how to achieve target with minimum time and get better performance. What Is exact challenges in Start-up company, normally different companies have been hiring crowdsourcing for the finding out a method for solving a technical and hard problems. Mostly determined, crowdsourcing is a expression used for some particular thing, a group of peoples, being partly responsible for to solve a problem or who's computational work on internet and get better results, means less time get more results, means reduce the time, cast, quality, quantity all services will be good. The word found by Jeff Howe in Wired Magazine in 2006. Finally included Oxford Dictionary, June 2013.

A. CMS Systems Advantages

On the other side, CMS many advantages:

1) A wide array of content type support beyond just text, photo, audio and vide
2) Proper control on site and content

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3) Changes can be made at a user leisure without the need of knowledge of different web development tools such as html, CSS etc.

This research paper study is based on development of CMS module/plugin called *EmpBox* to cover the details of faculty members of any educational setup. CMS has been specifically designed to cater the needs of faculty to develop their professional/academic and personal profile, research articles, project details, academic assignments etc. A custom built CMS is an open Source entity along with a generic EmpBox model which can be easily integrated with any existing web-portal Secondly, a fully functional prototype of web-based EmpBox CMS system has been tested and implemented. Their research paper a conceptual framework for their research was proposed and described in the methodology. They further described in detailed by identification main concept which consist on crowdsourcing, and also improve group of participations (Manuela Aparicio et al, [11]). Presented research work related with online video application that is based on the Internet offline and online videos and live streaming modelling of quality of experience (QoE) (Tobias Hoßfeld et al. [16]).

In this research paper presented online as well as offline and live streaming modeling for Quality of Experience (QoE). The authors presented a YouTube model that is able to upload, share the channels. For this, they proposed a generic subjective QoE assessment (Tobias hoßfeld et al [7]). In this paper presented a gaming service quality as well as the speed in the conjunction with high quality videos. Furthermore, they proposed computable hardware for playing the games online. Moreover they conducted a user perceived qoe for online gaming (Michael jarschel et al, [12]) and evaluated the techniques of subjective quality. They introduced the steps for the achievement of developmental work. They elaborated the techniques to optimize the delivery of content moreover, the authors emphasized on CMS dependability as well as the performance and evolution (Jong-seok lee et al. [8]). Analysed the analytical modelling as well as found the approaches for choosing the CMS operation. The authors designed a CMS content that is based on the classification system that speeded and created the usability of the methods that identify the connection between the bit rates and approximated subjective quality (Yong Wang et al. [17]). Assessed the quality of CMS with relation to the testing of subject in both time consumption and expense. The authors contributed in Quality crowdsourcing framework to perform effectively (Christian Keimel, Julian Habigt, Clemens Horch, [3]). Discussed the generic quantitative relation among the subjective quality evaluation through crowdsourcing in which both are required in order to be able to create the effective SQE control mechanism onto measurable crowdsourcing parameters. The authors of the papers selected crowdsourcing and SQE for minimizing the distortion jittering and services so that the relationship could be measured in smooth matter, (Fiedler, M., et al. [4]).

Presented CMS system and its methodology for crowdsourcing subjective quality evaluation. The motive of their research was to find the possibility of fast, reasonable as well as reliable subjective quality evaluation with crowdsourcing. The authors made a CMS web based system for conducting subjective quality evaluations using crowdsourcing platform. In the evaluation of subjective test conducted by online web survey from teacher as a part of adjustment process (Oscar Figuerola Salas; Velibor Adzic; Hari Kalva, [13]). This research paper helps research community to resolve two major issues. Firstly, to study the requirements to develop a fully customizable CMS for faculty members of any educational organization. Secondly, to study the issues related with crowdsourcing of faculty members to measure quality scores and effectiveness of custom build CMS The web application prototype EmpBox has been subjectively tested. A reason being for subjective tests are. Any objective test alone is not cable of determining effectiveness of solution, no matter how good it is, subjective evaluation gives impulse reaction of users along with their intuitiveness while using the solution. Additionally, this research paper of subjective quality of experience of Empbox CMS prototype application could possibly provide a convergence point for various QoE parameters in future studies. Crowdsourcing is relatively new field, however has emerged as a potentially rich field having roots in QoE (Quality of Experience) and QoS. (Quality of Services). Crowdsourcing is a business model for outsourcing work to crowd and have certain advantages following are a few highlights:

4) Low cost
5) Scalabilit
6) Easy access

However, in this research paper crowdsourcing technique has been proposed to be adopted for subjective study purposes, which is an innovative concept and essence of this thesis work. A crowdsourcing model which has been adopted for this work is a FLIRT model (Focus, Languages, Incentives, Rules, Tools), a successful crowdsourcing initiative must have:

B. Subjective Testing OR Quality of Experience (QoE) or Quality of User Experience

The chief outcome of this research paper is to develop a web application called EmpBox (Employee Box). The web application prototype EmpBox is required to have subjectively tested. Since, any objective test, no matter how good it is, isn't capable of

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contesting with subjective evaluation. Additionally, Empbox CMS model application subjective QoE could be a convergence point for various QoE parameters.

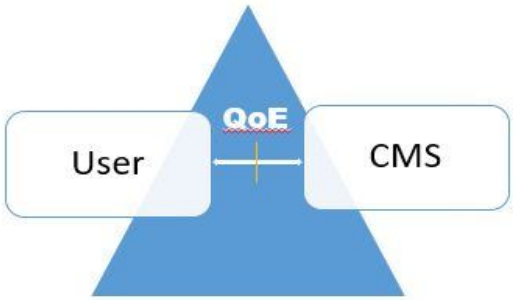


Fig. 1. Three basic linking ring of QoE

This work is aimed at bridging this gap among different domains of modeling framework by developing a comprehensive quality of experience modeling framework to encompass not only user perception or feedback but also cover a detailed description about mapping of different user centric domains.

C. Crowdsourcing

To achieve this research paper, the major portions of research work are divided in small steps. Since, research study covers quality of service, quality of experience, development work and testing. The one portion of this paper work related with testing is associated with crowdsourcing. Crowdsourcing is relatively new field, however has emerged as a potentially rich field having roots in QoE and QoS. It is pertinent to mention here that one portion of this research work is based on testing through crowdsourcing. It is essential to define why we have opted to conduct tests of custom built CMS through crowdsourcing.

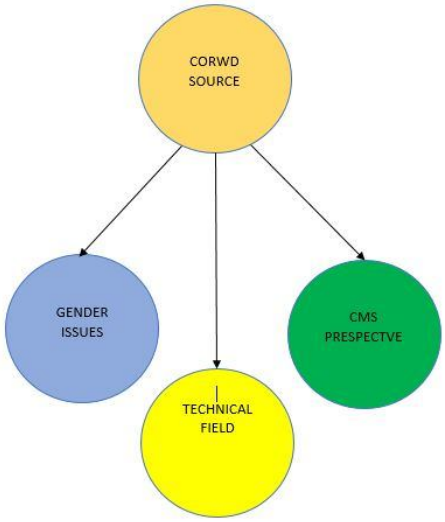


Fig. 2. Crowdsourcing Generic Model

The crowdsourcing term got its source from coining two words “crowd” and “outsourcing”. Since testing at mass scale requires to outsource persons who can subjectively evaluate any particular entity. If the testing is at lower scale where only 20 to 40 subjects are required then it is easier to manage. Since, tests can be announced locally and participants can register themselves. However, complications increase as the requirement for participants grow from a few to many participants. Additionally, this research study requires to have the test participants from the pole of university male teachers/ female teachers’ administrative stuff using different gender. Since, it is essential to recruit the test participants from the locally available pole to avoid complexity. Furthermore, recruiting employees/faculty members for a particular task, our organization just need to advertise for the job or make an application

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and launch on the Internet, that it wants to be done and then many people or faculty members will then come in and perform the task, for example here faculty members will perform task.

In addition to this, using Content Management System (CMS) perspective and other internal crowdsourcing using as technical field which require to work from the pole of a large group of people, needs to follow certain steps. In this case for the research model we need to call university academic members as a subjects through a technique called crowdsourcing. The term got it source from coining two words crowd and outsourcing. Rather than recruiting employees/faculty member for a particular task, an organization or the entity under study just require to advertise for the job or make an application and launch to request potential subjects for testing on the Internet through advertising medium.

There are numerous crowdsourcing Content Management Systems (CMS) web applications available today. Since the coining of the term in 2006, many online web applications and companies have achieved their goals using this technique. CMS web applications can achieve their goals by either working online or offline but in most cases online. Collaborative environments are the best example of multiple users working to achieve similar type of targets. Content management systems are used since so long to create good collaborative environments. Educational institutes normally have their websites to keep in touch with students, faculty members and researchers etc. Contents of the websites of educational organizations are managed and upkeep by the webmasters appointed to Content Management Systems

III.METHODOLOGY

A. Interaction of different domains of generic EmpBox CMS Application model.

EmpBox covers two generic interactions, one for registered users and second for unregistered users. Both interaction paths communicate with EmpBox through webserver. Registered users can get their profile built in the EmpBox through an administrator of this CMS. However, unregistered user can get the information of employees of the university directly through approaching the SAU domain OR searching the employ information on any search engine such as google.com etc. EmpBox CMS covers details of employees working in Sindh Agriculture University Tandojam. The details of employees published on SAU portal through EmpBox includes personal, academic and research information of employees and faculty members.

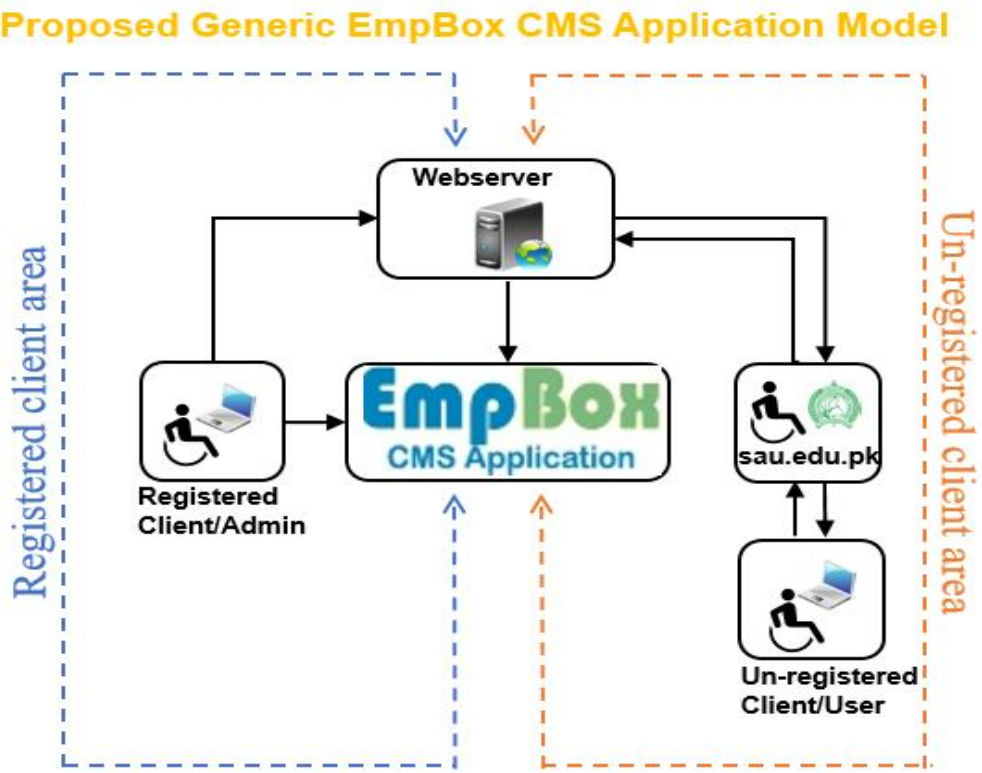


Fig. 3. Proposed Generic EmpBox CMS Application Interaction Model

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In order to get registered at EmpBox, a user needs to land on the signup page of EmpBox via SAU domain. As a first step, email address of the intended user is verified through sending a verification link in his/her inbox. After verification, user can fill up additional signup information. After filling up all required forms, details of user are forwarded to administrator of EmpBox for necessary formal approval. Once the user gets formal approval, he/she can update EmpBox details by signing in. The three prominent areas user can update are personal/professional, academic and research. Once a user update these fields, through centralized database, all the details of their profile all populated on SAU official domain. A generic EmpBox CMS model containing the details of registered and unregistered user is presented in the *Figure.03.* The left side of the generic model contains details of registered user. The right side of the figure contains detailed steps of un-registered user. A webserver works as centralized component for both interaction. For the simplicity reasons, it is important to explain here that EmpBox doesn't necessarily be hosted on the same webserver where the SAU official domain is hosted.

B. Proposed Applied EmpBox CMS Application Model

The next step of this research study is to develop and define applied model for EmpBox CMS. Figure. 4 contains details of the applied model. A registered user interacts with the web-server through a client module. Client module contains two sub domains, one is admin panel and a registered client module. To interact with EmpBox registered client may interact with the Registered Client Control panel. However, the case is different when it comes to admin of the client and admin of EmpBox appears. From registered client side admin is the only authority which can interact with the admin control panel.

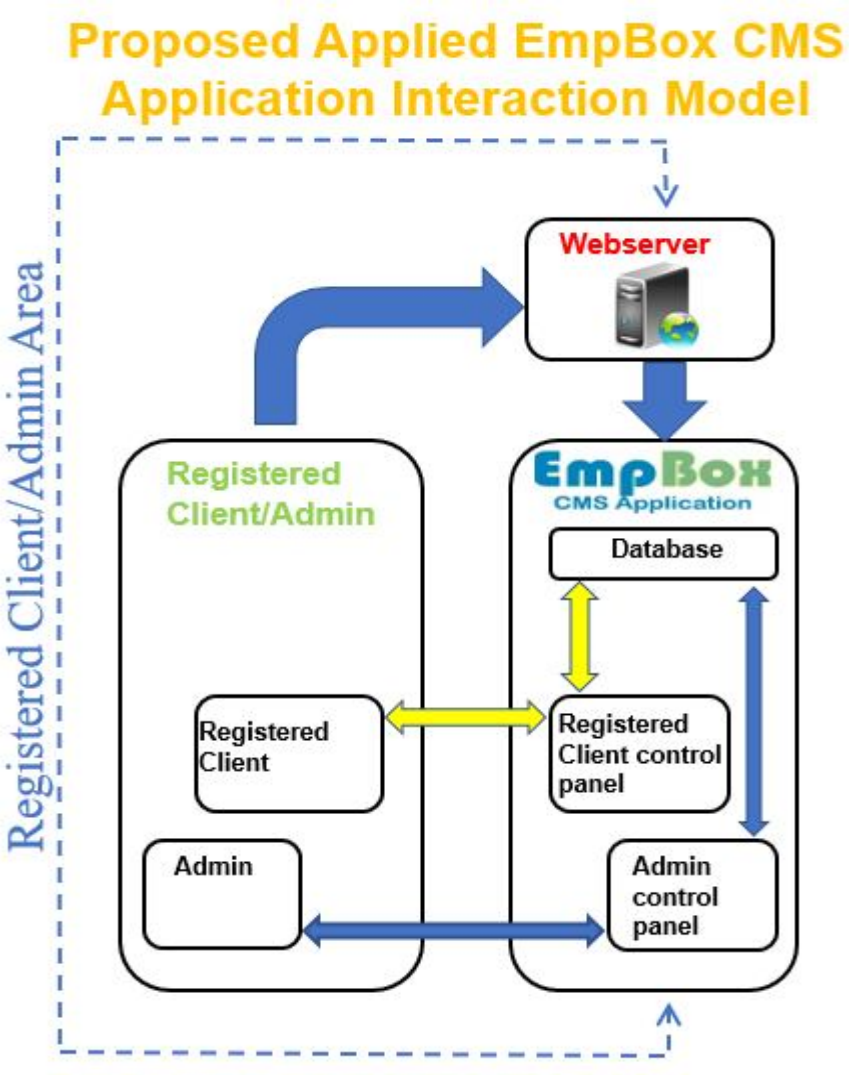


Fig. 4. Proposed Applied EmpBox CMS Application Interaction Model

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In this research paper have proposed study covers details of the methodology to encompass this research work. As a first step, existing CMS applications process in universities of internal activities. A generic model for existing Empbox application has been developed. Additionally, an important outcome of this research paper work is a PHP server side pre-processing language. This research work has been achieved in two steps as presented in the following: As a first step, a comprehensive study has been conducted to analyse crowdsourcing for subjective tests has been done by hiring faculty members of SAU who are the potential users of this CMS. And process of Sindh Agriculture University (SAU), Based on the outcome of the analysis, a detailed set of recommendations for Embox and process have been presented. Additionally, admission process model has been developed for the preparation of the prototype. As a second step, a web-based prototype has been developed using mix technologies such as open source frameworks such as PHP, MySQL, Ajax and JQuery. This prototype covers the details of hiring faculty members profiles additionally, to develop ease of use for teachers and this Empbox application have been developed for faculty members alerts, communication each other's authentication and registration.

C. The Technology Used

We can enhance this research paper or solution to cover the modern aspects of the technology used in the area of research and teaching. This research paper has been designed as a GUI based environment, which can be used online on internet through browser. Users are just required to type url://sample-abc.com on internet explorer or google chrome or any other browser etc. Additionally, recent and active technologies have also been touched upon. Therefore, the outcome of this research paper is on two folds, one is a web application and second is a subjective study of the proposed solution. For web application server side scripting language PHP language, Ajax, JQuery and MySQL were used. Furthermore, for subjective testing, teachers of Sindh Agriculture University were employed to take part in this subjective study.

1) *PHP server side scripting language :*There are many advantages of using PHP as a server side scripting. Since, PHP can be utilized alongside traditional HTML code. In this way, HTML functionality can be enhanced in many folds. *Figure. 05*

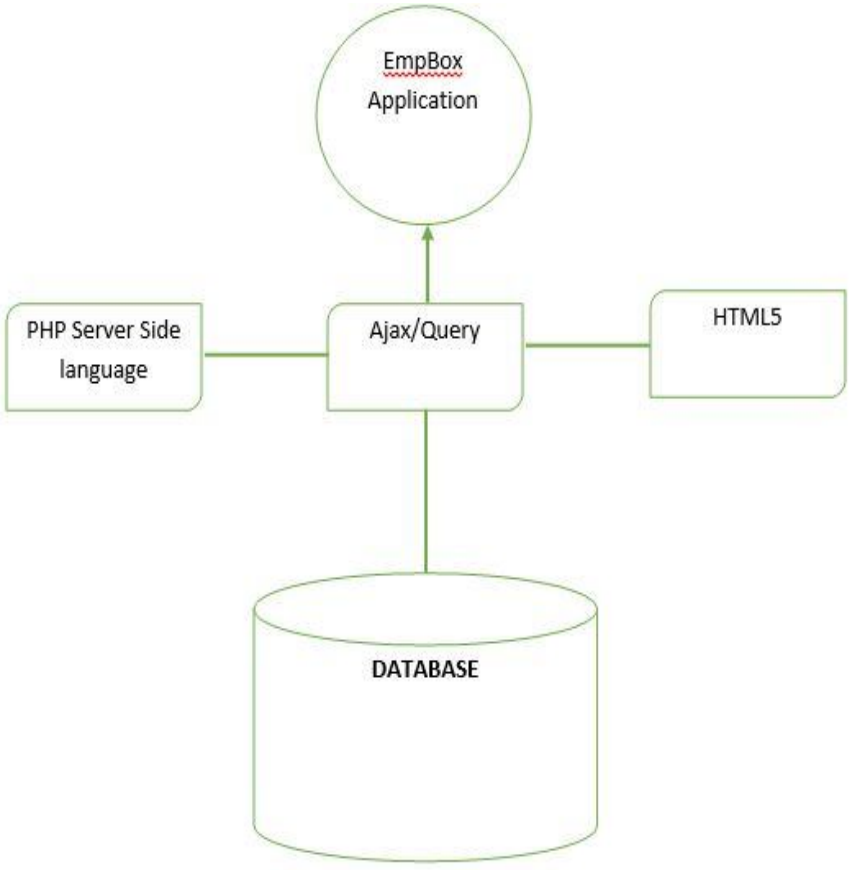


Fig. 5. Empbox web application backend working structure/Architecture

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However, these days it is easier to develop a complete web application using PHP code. Furthermore, enhanced advance level options can be used for overall development of the project life cycle. Thus, PHP framework offers endless advantages for development for web applications.

2) *MySQL:* For every web application, it is essential to have a database to store project data. In line with the project, MySQL has been opted to work as an open source entity to store all the details of this research paper. It is essential part of the research to have well versed database. Since, many details of the research such as: email accounts, blogs and other content management details are required to be saved in the database. Furthermore, PHP and MySQL has a well-known combination with each other. Another advantage of using MySQL is its open sources nature. Developers as well as owners show immense confidence in open source project.

D. Installation Of The Application And Its Requirements

Through SAU Website this web application can be used and access accessed. Users can access this web application through any hand-held, smart as well through desktop or mobile device. Additionally, this application can be used Empbox as a website.

In the following three steps through which EmpBox CMS has been developed has been presented.

Step 1: Project Database tree was conceived and created

Step 2. Layout was designed and developed including User Interface (UI) online web based application

Step 3. Online web application was hosted on Server, also on a cloud

In the following description of the EmpBox research project has been presented:

E. Design Of System Architecture For Empbox Application:

This section covers details of the flow chart of the EmpBox application. Furthermore, a process of each section has also been highlighted. It is an essential requirement that a user should have the Internet connectivity on his/her mobile device and/or the desktop/laptop computer. Thereafter, by visiting on EmpBox CMS Application project site or associated with SAU main websites. *Figure. 06*

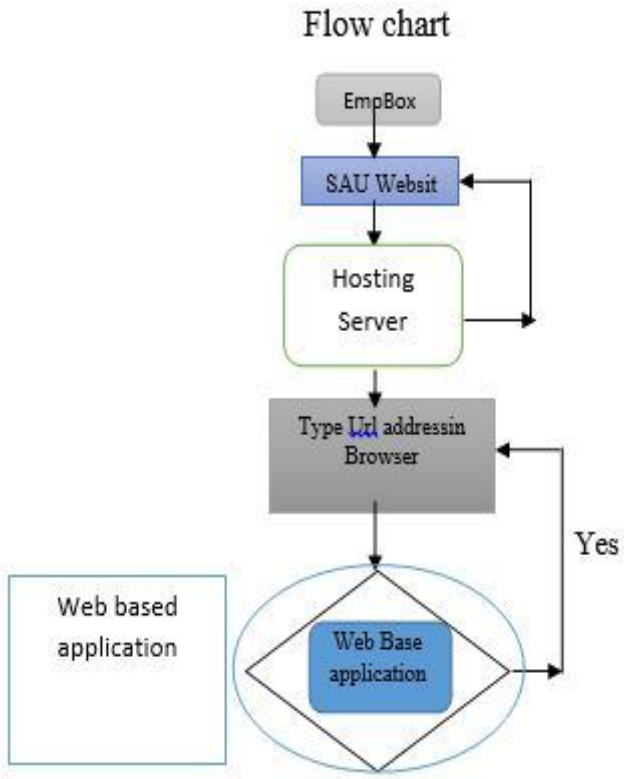


Fig. 6. Flow Chart Diagram for android application

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IV. RESULTS

In this research paper result presents details of the outcome achieved during this research work. There are multiple components of this research which have been achieved and implemented. The first thing which has been achieved is CMS open Source application along with a generic EmpBox model. Secondly, a fully functional prototype of web-based Empbox CMS system, available online (domain.com). Thereafter, fully functional prototype as we can use online and smarts phones, Along with this developmental work, a subjective study has been conducted to verify the effectiveness and easiness of EmpBox CMS system. In the following sections Empbox models have been presented. The Empbox model is a generic model for Empbox CMS system. In the Figure.7 and generic model for Empbox CMS system is presented. The model contains sub domains which are application area consisting of user registration, signup information, online registration submission.

A. This data shall be shared among all HEIs

1) Register Data
2) Login data
3) Personal Data
4) Employment Data
5) Profile Update Data

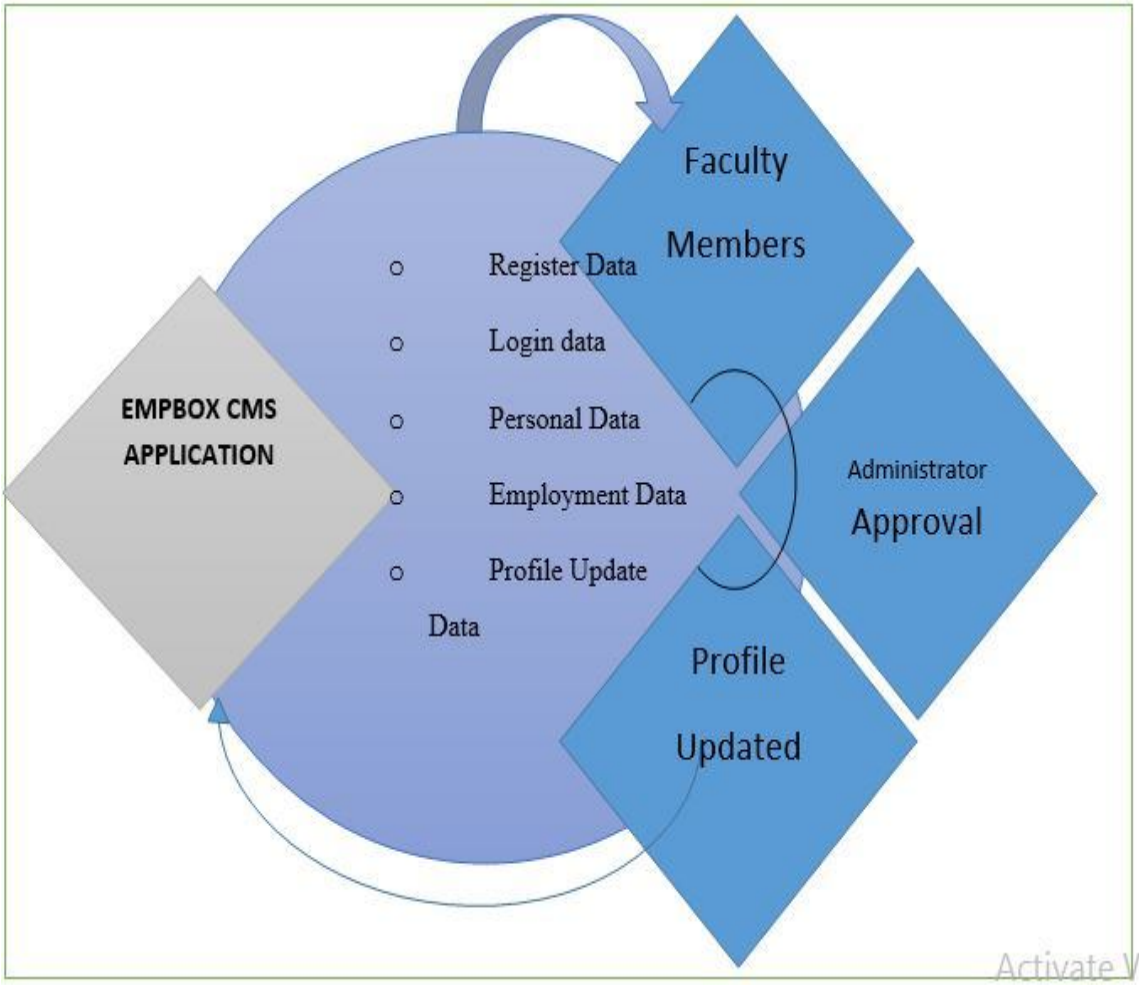


Fig. 7. EmpBox CMS functions Interaction Model

Fig. 7. Empbox a generic model for EmpBox CMS Subjective Quality Evaluation via Crowdsourcing. Furthermore, data related with all faculties teachers is also shared among relevant all sectional heads or Administrator's, and as that when administrator receive information about any teacher then he reviewed and then give approval.

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7) Registration Information
8) Academic Information
9) Complete Profile and CV

The second model is extended version of generic model for EmpBox which contain detailed interactions within different sub domain of the models. Interaction among sub domains of the model is very important to define. Since, it depicts original picture of all the components talk to each other. As it can be seen in Figure. 8. The core of data side of the model contains interactions among all participating of University teacher's. Additionally, it was very important for us to design such a robust system so that every module may also be able to talk each other.

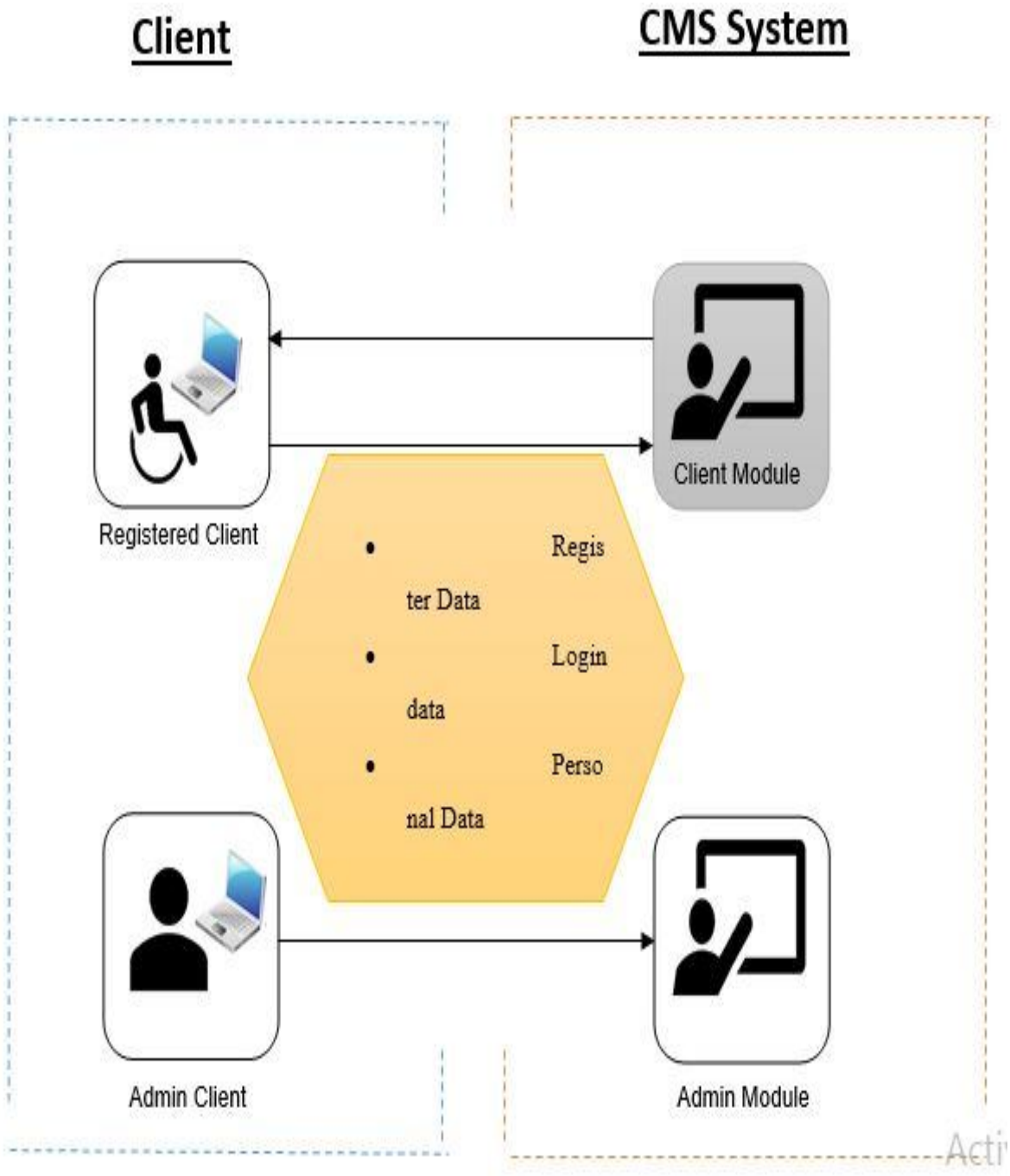


Fig. 8. Interaction among sub domains of the model

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Furthermore, this model shows flexibility, and this can easy to create there profile and anything updated self, additionally, on the layering basis, the Figure.9 contains type of data and how it is shared is presented. As it can be seen that on the first layer (bottom layer) there are four data types which are considered very important and are shared among all faculties' members and administrators of this EmpBox application. On the first layer following are the data types:

10) Signup
11) Authentication
12) Personal data
13) Academic Profile
14) CV
15) Research Papers

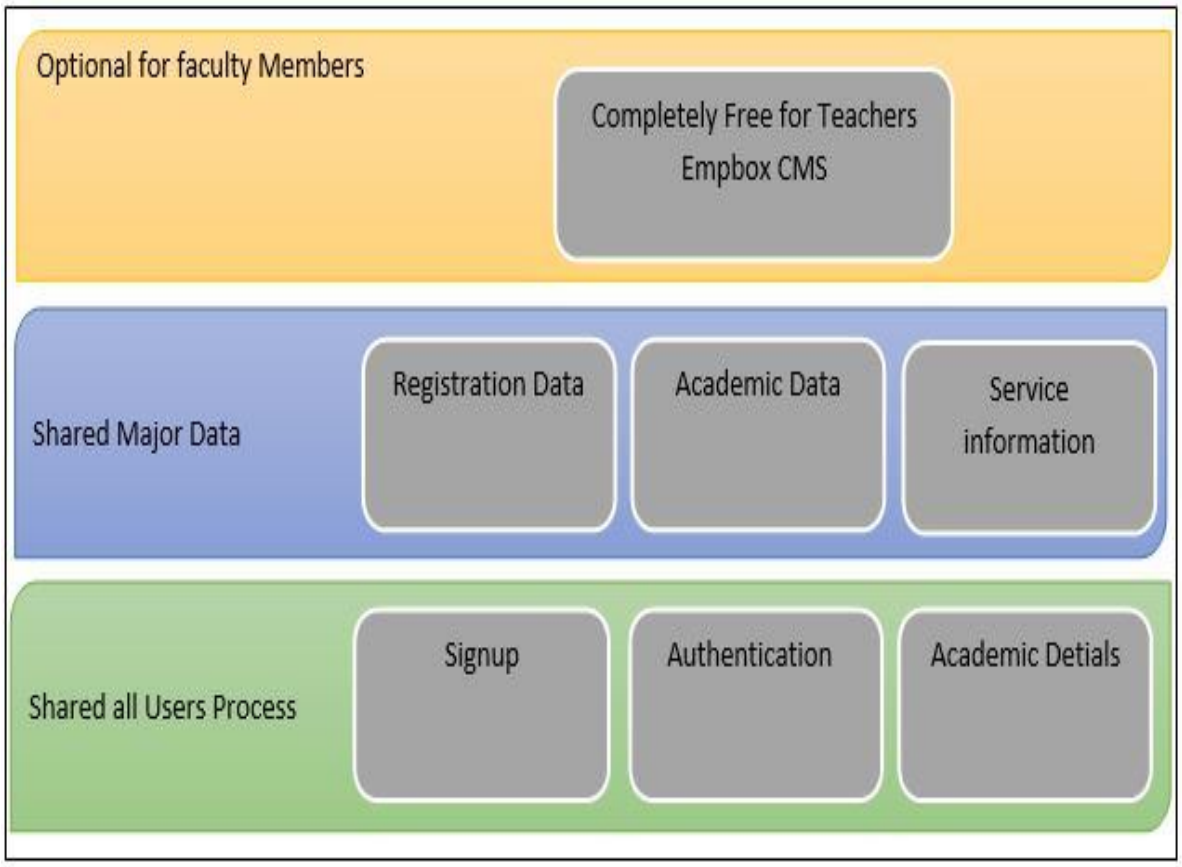


Fig 9. Interaction among sub domains of the model

B. Crowdsourcing Subjective Test Result

A Flirt crowdsourcing model was adapted for the crowdsourcing altogether, 23 university teachers (non-IT professional) participated in the subjective study.Out of which 19 test results were considered and remaining 4 results were discarded due to incompleteness Following questions were asked and Mean Opinion Score (MOS) on 5 quality scale numbers were recorded for each performance questions.

1) Kindly develop your profile on *EmpBox* (give quality score on MOS scale for this activity)
2) Kindly fill a signup details using *EmpBox* CMS (give quality score on MOS scale for this activity)
3) Kindly add your details to your profile (give quality score on MOS scale for this activity)
4) Kindly sign-out and sign in again (give quality score on MOS scale for this activity)
5) Kindly modify your profile (give quality score on MOS scale for this activity)
6) Kindly give quality score on MOS scale for your overall experience using EmpBox

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C. Following is the subjective Test Result.

TABLE I
SUBJECT TEST RESULT

S: No	Subjective Question number	Subjective Activity Question	No of subjects participated	Average MOS Score
1	1	Develop your profile	19	3
2	2	Fill a signup details	19	3
3	3	Add your details	19	3.5
4	4	Sign-out and sign in	19	3.5
5	5	Modify your profile	19	4
6	6	Overall quality score	19	3

V. CONCLUSION

SAU Tandojam have distributed resources for all kind of information including Email IDs, MSDN accounts, office 365 accounts and for 24 hours Internet facility for teachers get process. In this research paper, a generic model called Empbox for the faculty members of Sindh Agriculture University (SAU) Tandojam has been proposed and achieved. This research study is based on the development of a CMS called EmpBox for the faculty members of Sindh Agriculture University (SAU) Tandojam and to conduct its subjective tests to get user satisfaction and quality score through crowdsourcing has been achieved. At the moment, all teachers/officers, applying for account on Empbox to above said faculties, fill online registration forms and take part in the activation process separately for each faculty account. Through Empbox these short comings in online account activation policy and process have been shared through professional profiles in detail and through web-based solution all details are going to be provided to faculty members of SAU Tandojam. A web-based Prototype application for such model have been developed for account process authentication and registration of faculty member or administrative officer. For web-based prototype, open source tools such as PHP, MySQL, Ajax and JQuery have been utilized. This research work has been successfully achieved along with its all objectives. There are numerous parts of this research which have been successfully achieved and implemented during the course of this research work. The most important part of this research paper which has been achieved is fully customizable CMS for faculty members of any educational organization along with a generic Empbox model. Secondly, a fully functional prototype of web-based Empbox online CMS system. Along with this developmental work, a subjective study has also been conducted to verify the effectiveness and easiness of custom build CMS. Furthermore, two models have been presented. The first model is a generic model for EmpBox CMS system. The second model is extended version of generic model for EmpBox which contain detailed interactions within different sub domain of the models. A generic model for EmpBox CMS system is presented. The model contains major sub domains which are application area consisting of teachers' signup information, online application submission. Also in this research paper focused as a technical field crowdsource and have care about quality of experience (QoE) through conducting subjective test then measure results.

VI. FUTURE WORKS

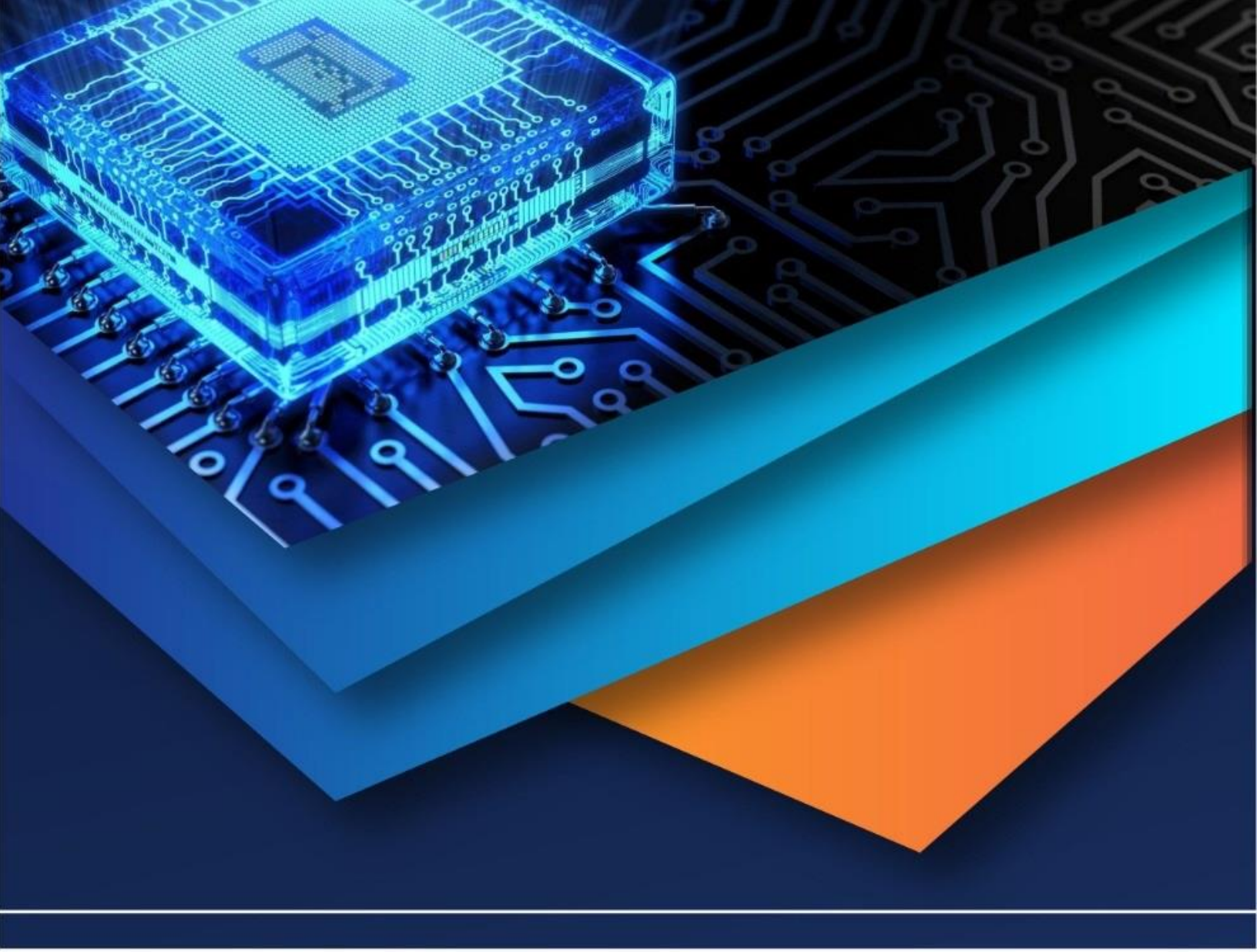
What we will do when startup company, new business with utilization of Community Networks. I will examine that how many companies using community networks techniques, and also my future study will consist on help of crowdsourcing, with practically research using CiteSpace software for analysing and visualising and also extraction data from literature review and for scientific results, specially community network & crowdsourcing trends and find out top countries which one using network science field related community network & crowdsourcing.

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