

understand the whole process including actor roles inside a cloud computing environment. There are very fewer architectures related to the cloud that may help in building a solid foundation for cloud computing infrastructure. Many organizations and managements are reverting to the idea of using cloud services to reduce cost and improve the efficiency. Cloud service management is an important aspect which this paper describes.

3. Proposed System

The proposed model is having a tablet, stylus and a secure communication network. The tablet is equipped with the necessary android app with provide an interface to write the answer on virtual answer sheets. There will be a provision of reviewing questions and answer at any point of time during the examination. The system can be operated with three sets of user as Admin, supervisor, student. Admin create question papers. Supervisor distributes the question papers. Student writes on the virtual answer sheet. The experimental setup of proposed system is shown as following the figure.

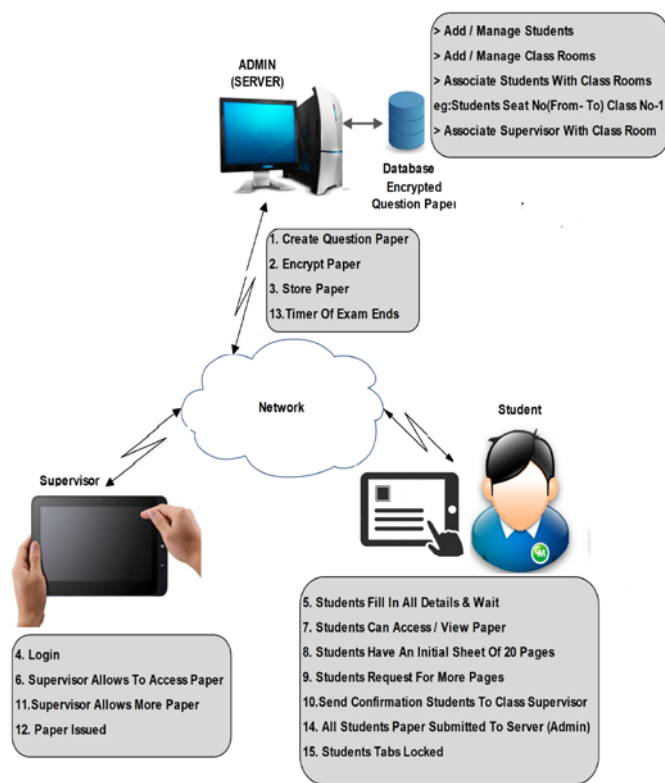


Figure 2: Architecture diagram for online virtual subjective examination system

Question papers are created by the university, and those are first encrypted and then stored in the database. Supervisors are selected for each college by university only. At the time of examination, supervisor will login to his tablet. Once the supervisor logs into the tablet he gets the basic information related to the examination. Then authenticated supervisor will request the university to send the question paper on his individual account. After this process, the university will send the question paper to the valid user. Then supervisor will distribute the question paper among the student in the digital format.

Student will authenticate himself by one-time password authentication and once the authentication is done the student will write the answer of the respective questions in digital format via a tablet and a stylus. Once the examination starts there will a timer that will get automatically initiated and once the time stipulation finishes the tablet will get freeze that is the student would not be able to write the examination further. After attempting all the questions, there is the patch provided to exit from the examination. The PDF of particular answer sheet will get generated and then will be sent to the supervisor's account. Supervisor will collect all PDF's and store it in the private ubiquitous cloud. The files that will be stored in the cloud will be in an encrypted format.

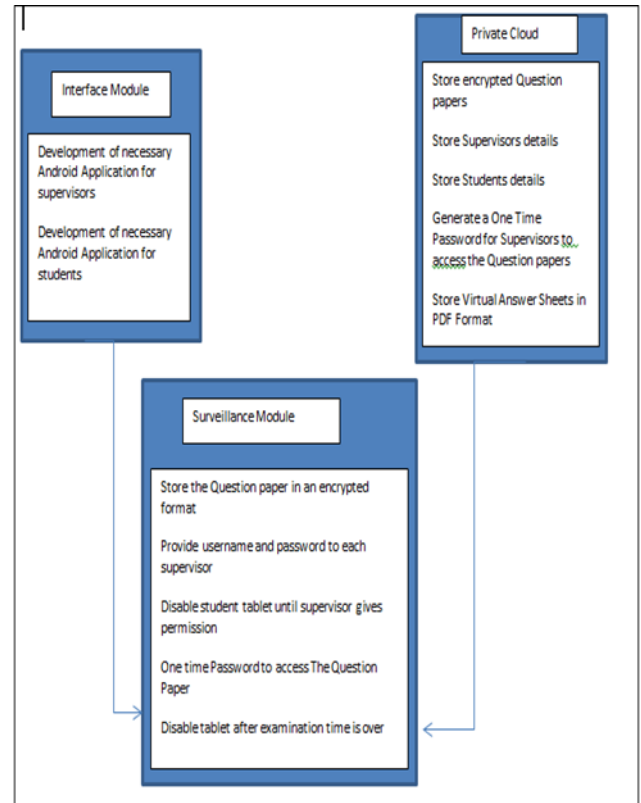


Figure 3: Module diagram for online virtual subjective examination system

4. Security Analysis

Every system cannot be effective until and unless it should be provided with security. The proposed system also being secured with necessary secured communication. The primary analysis for the implementation of security is being presented in the following tabular manner.

Table 1: Security Analysis

Sr No	Security Issues	Consequences	Counter Measures
1.	Authentication	Access will be denied to the valid user	Providing legitimate username and Password
2.	Storage of virtual answer sheet in the cloud	If the answer sheet is not stored in the cloud in an encrypted form, the contents can be accessed	A proper encryption algorithm will be used to avoid any loss of data integrity
3.	Accessing The Question	Students can access the Question papers only	Use One Time Password

	papers	when Supervisor enter this One Time Password which will be given by server	
4.	Data exchange/transfer	Contents of the paper from a particular tablet can be transferred to another tablet during examination calling it as a copy	Blocking the features of the tablet like Bluetooth and Wi-Fi till the examination gets over
5.	Time parameter	Student may write the paper more than the stipulated time being provided for the examination	Timer is set and as soon as the exam time gets over the tablet freezes that is the functionality of the tablet gets disabled

5. Future Enhancement

The proposed work can be extended with the provision of intelligent high-resolution camera, GPS and big data for the higher accuracy and performance of the system.

Camera can be installed and configured in the necessary premises. These cameras can take over the supervisor role. GPS enabled tablets can be incorporated in the proposed project to trace the location of a given student having the tablet. Pune University will have a large amount of information to process so we can provide Big Data concept to store the information in the database.

6. Conclusion

As per the existing survey we have come up with the motivation of the problems faced by offline examination. The proposed system can provide strong and efficient input to the existing online examination system.

References

- [1] G.Ganesh Sriram, B.Vijaya Aditya, M. K P Gupta, R.Santosh Kumar, "Application Study on Cloud Computing Based Virtual Campus" IJIET 2013
- [2] Tarkeswar Prasad, Arunasish Acharya, "An Architecture of Cloud Computing Based Online Examination System" IJCST 2012
- [3] Sachin G. Deshpande, Jung-Neng Hwang, " A Real-Time Interactive Virtual Classroom Multimedia Distance Learning System" IEEE 2001
- [4] ZhangAiHua, "Study of Ubiquitous Learning Environment Based on Ubiquitous Computing" IEEE 2010
- [5] Alwin Crasto¹, Sujeetkumar Sinha², Sagar Raut³, Imran Mirza, "Ubiquitous Computing in a Lab Environment" IEEE 2013
- [6] Carla A. Romney, "Tablet PC Use in Freshman Mathematics Classes Promotes STEM Retention" IEEE 2011
- [7] Chen Kai, Design Principle for Ubiquitous Computing, Department of Informatics, University of Fribourg, Switzerland, 2010, pp 1-7.
- [8] ZHANG GUOLI, LIU WANJUN," The Applied Research of Cloud Computing Platform Architecture In the E-Learning Area." IEEE 2010.

- [9] Sungkue, R.K. "An enhanced mechanism for the authentication of students taking online exams." IEEE 2013
- [10] Basar, E. " Object oriented business architecture on online exam and assignment system" IEEE 2014
- [11] Li, Xiao-Feng "Examination system in the cloud computing platform based on data mining" IEEE 2013
- [12] Best, I.D. "Private study with search engine support – Examination" IEEE 2013
- [13] Wang En Dong "QoS-Oriented Monitoring Model of Cloud Computing Resources Availability" IEEE 2013
- [14] Amanatullah, Y."Toward cloud computing reference architecture: Cloud service management perspective" IEEE 2013
- [15] National Institute of Standards and Technology (NIST) Manual- 'Framework for cloud usability '
- [16] <http://timesofindia.indiatimes.com/city/jaipur/RTUs-exams-may-go-online-this-year/articleshow/30694953.cms>
- [17] <http://www.dnaindia.com/academy/report-online-evaluation-for-cbse-to-begin-from-2013-1777383> 1/6