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ORIGINAL CONTRIBUTION

Cloud Backed Education System

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ABSTRACT

The term “cloud computing” is a recent breakthrough in computer science world. In this modern world of computing, anything that can be served to you at a minimum price refers to the computing behavior. Cloud computing is aimed at greater flexibility, availability, reliability and scalability with utility computing model. This paper is a brief survey based of relevance of “cloud” computing in the field of Education and it tries to address related research topics, challenges ahead and possible applications that could change the future era. Education in the field of Cloud computing refers to providing software, storage, computing power, books, platform and other services to customers from remote data centers over the Web.

Key words: Cloud computing; Education as a Service; Platform as a Service; Books as a Service; Storage as a service; Software as a service

1. INTRODUCTION

Cloud computing is a method through which you get a solution to your service via internet. The best thing you could do with cloud is that sitting in front of your computer, you get to access other computers. You could use their services, their applications, even their memory! Cloud services are provided to the cloud users as utility services like water and electricity using pay-as-you-use business model. These utility services are generally described as XaaS (X as a Service)^{[3][4]} where X can be Software or Platform or Infrastructure etc. Cloud users use these services provided by the cloud providers and build their applications in the internet and thus deliver them to their end users. So the cloud users don't have to worry about installing, maintaining hardware and software needed. And these services are fairly affordable as the users have to pay only as much they use^[5].

India currently has the largest illiterate population^[6]. Sometime in the near future, we might be having 10G network speed but we will, still be a developing nation. When the literacy rate is still poor, technology in hands of people who don't know how to cash it

to their advantage, is technology wasted^[6]. Cloud computing can play a pioneering role in the spread of education to all strata of society.

1.1. Education as a Service (EaaS)

Education is a primal need for every citizen. No nation can ever develop sans an educated and aware population. Ideally speaking, it is through education that members of society, particularly the youth, come to understand the working of society.

Technology can be leveraged to change the course of education system that has been followed in India for so many years. With information on your fingertips and so much content present online, what is the point of carrying a bag full of books to school still? We need to move towards a better future with the help of cloud backed technologies and services to digitalize things in the real sense of being.

2. MONEY AND TECHNOLOGY

This section explains how the Education as a service (EaaS) will help change the scenario of education in India. As an estimate from class 9th, if the cost of NCERT books and copies along with stationary is calculated, it would be

Rs.3500. The same holds true for class 10th, whereas for class 11th and 12th, an extra cost of one thousand rupees will be added. After the secondary education if a student wants to go for

coaching then an approximate cost of the books would be Rs.20,000 along with copies and other things.

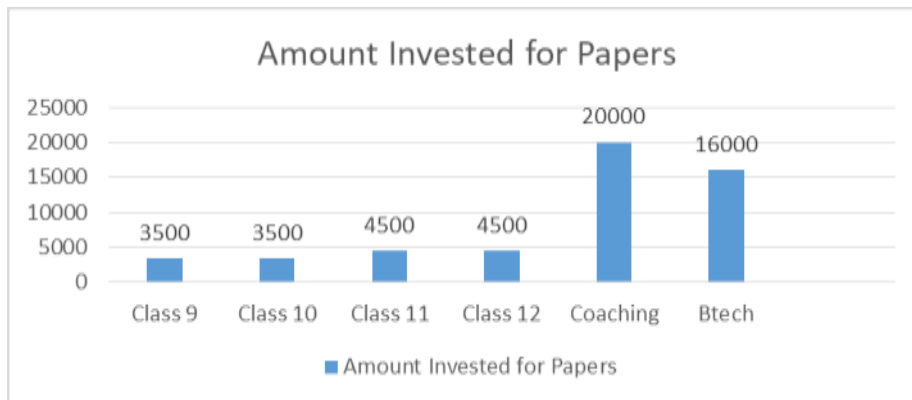


Figure 1: Annual investment on paper based stationary for an Indian student.

2.1. Education as a Service (EaaS)

The total cost per person can be brought up to a single device. Moving all your books, class notes, documents, projects to a single book or a copy which would be a generally a tablet would

be the future of education. You are free to store as much data as you want and can download as many books. A whole library could be fed to a single device with all the different services included in it.

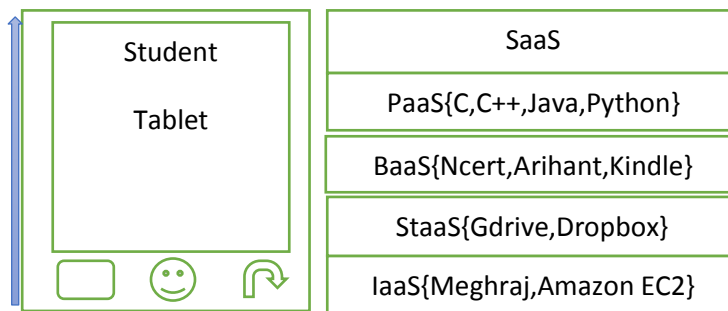


Figure 2: Various Platforms Installed on the Student Tablet

3. WORKING MODEL OF EDUCATION AS A SERVICE (EAAS)

The workflow of Education as a system consist different types of services which includes Software as a service(SaaS), Storage as a

service(StaaS), Infrastructure as a service(IaaS), Platform as a service(PaaS) and Books as a service(BaaS). Below there are some pictures related to different types of services that must be included in EaaS.



Figure 3: Account Login page



Figure 4: Various Services Installed on the Student Tablet



Figure 5: Using Software as a Service (SaaS)



Figure 6: Using Storage as a Service (StaaS)

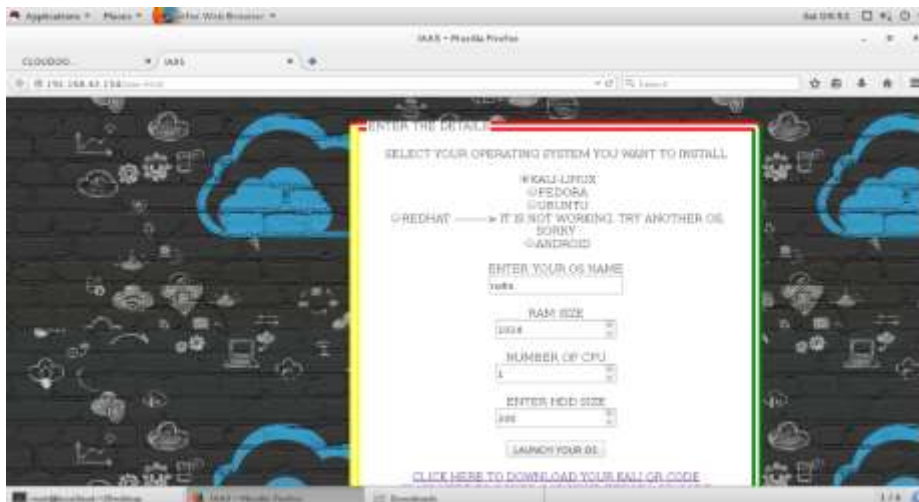


Figure 7: Using Infrastructure as a Service (IaaS)



Figure 8: Use of IaaS and installing any Operating System on the Student Tablet



Figure 9: Using Platform as a Service (PaaS)

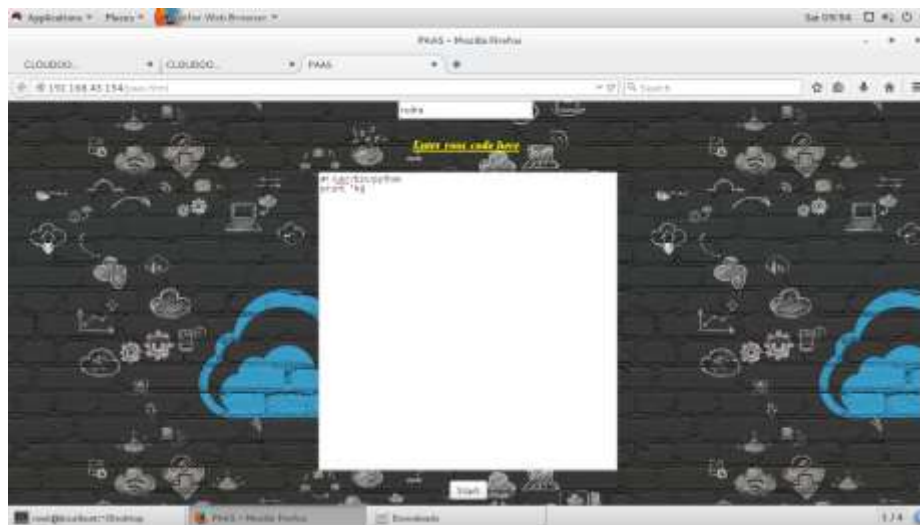


Figure 10: Writing any program in Platform as a Service (PaaS)

4. FUTURE OF EDUCATION

There might be a lingering doubt over the concept of a cloud database used for educational purposes. But we have to, considering the present scenario regarding global warming and number of trees being cut down for every single page, move to a new era of education. Below is a flow chart which explains all the services used at various levels along with a second figure representing that how the services would be provided to the common user.

The overall estimate of minimum cost for the tablet having a 15" display with minimum of

16GB internal storage, 4GB ram and android 5.1 would be around Rs.25,000-30,000(approx.)^[10]. Services that are being provided through the tablet would be in the form of apps and would link to the website directly where you could directly fetch or upload your data and after using it you can uninstall it. Buying a student tablet is just like buying a permanent book for your life like the Aadhar card. Tablet will be having a internal storage for using services like Software as a Service (SaaS), Books as a Service (BaaS), Platform as a Service (PaaS)^[3]. Data that is being created offline would link to the network directly after an interval of time and would

redirect all your work to cloud storage where a service is being invoked known as Storage as a Service. There might be some task where you need to launch some another O.S so that you can have all your projects running at that moment of time at your perusal. Infrastructure as a Service

is a best option of all. You can launch “Meghraj”^[7] whose main focus is on optimum utilization of the infrastructure and speeding up the development and deployment of eGov applications.

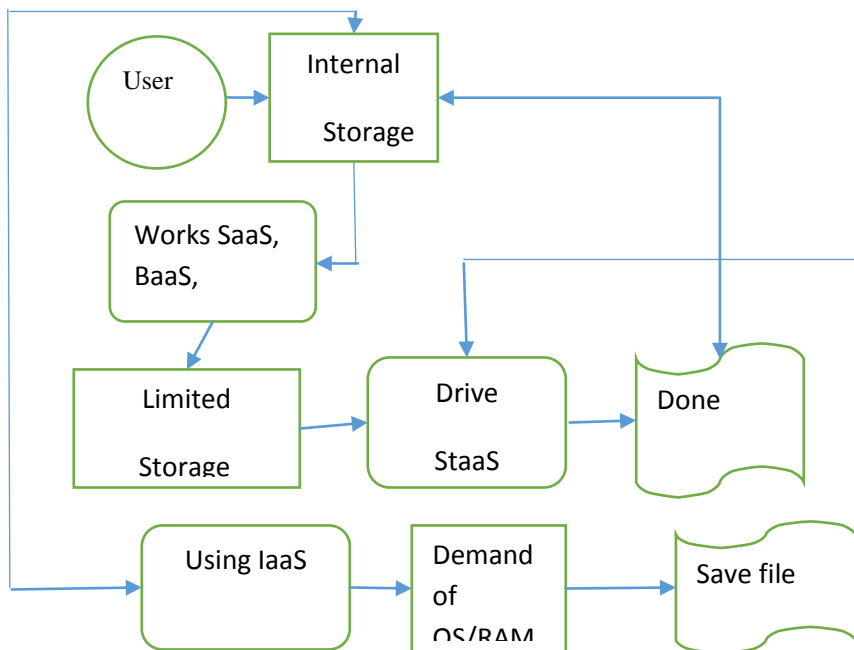


Figure 11: An overview of the tablet

The monthly cost for a minimal infrastructure with Server Configuration 1VM with 01vCPU, 01GB RAM and 60GB Storage and having Platform Linux(RHEL) is around Rs.3,133.00* (Approximate) Monthly^[8].

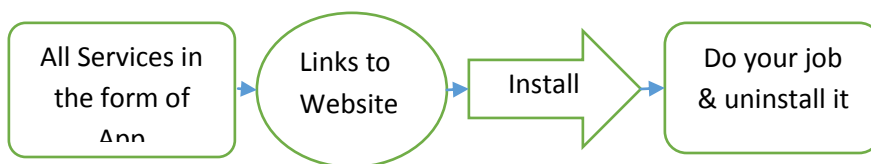


Figure 12: Showing the use of any services via applications

Services that are being served to the clients are linked to a website through an app which you can download and you can uninstall it after use. After the completion of every task the records are being uploaded to a drive and then your internal storage becomes free.

4.1. Education as a Service (EaaS)

Technologies like kindle have made e-books a popular phenomenon. In Indian school system

though, we have not digressed much from traditional methods of learning. Things however are changing. With smart classes being introduced in the school system, digital libraries and online books will soon be commonplace. Cloud backed systems can be put to use to store and manipulate the huge database thus created.

5. GREENER ENVIRONMENT AND DIGITIZATION

The current scenario says the total number of trees in India is 35 billion and the population of India is 1.3 billion i.e. India has 28 trees per person. This is not a healthy proportion and our concern should be going digital^[9].

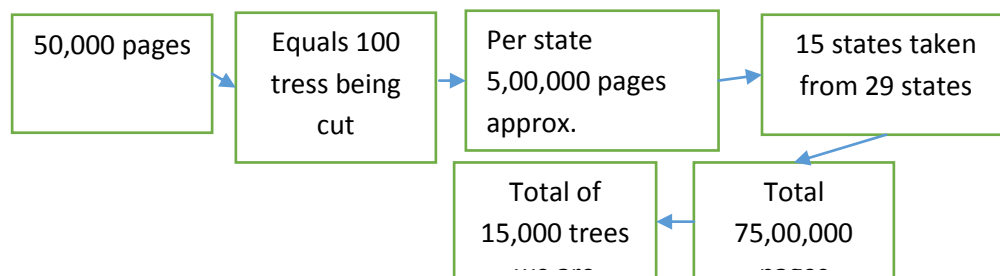


Figure 13: Overview of the number of trees being saved from being cut down by the cloud based system

When we talk about a project, it is a necessity to think about environment safety. I would like to give a small example how this project deals with saving trees. If we save 75,00,000 pages from being used in just 15 states of India (excluding 14 states) i.e. 5,00,000 pages from each state. This saves about 15,000 trees from being cut down.

6. CONCLUSION

Digital India if utilized in a proper way can be proved to be a boon to today's society and education system. It also ensures a good utilization of money and of time. The use of today's technologies can make it convenient

for both parents and students. The medium of education "EaaS" needs to be promoted for the money and time it saves. This'll also make students aware of all new and useful technologies.

The use of primitive systems when the world is taking new leaps in embracing technical wonders each day could prove to be detrimental to both our growth and our ecological balance. Technology and nature could very well go hand in hand, if handled with caution, balance and brains. And cloud based educational database could prove to be the best example of this fact in the years to come.

References

- [1] Cloud Computing, <http://www.explainthatstuff.com/cloud-computing-introduction.html>
- [2] M.Tech. Seminar Report by Abhirup Ghosh (Roll no :09305052) under the guidance of Prof. Anirudha Sahoo; Cloud Computing https://www.cse.iitb.ac.in/~abhirup09/Docs/cloud_computing_final_report.pdf
- [3] Prof. Soumya K. Ghosh, IIT Kharagpur. NPTEL lectures on Cloud Computing, Cloud Services Model, <https://www.youtube.com/watch?v=lOh2x-UACaU>
- [4] Prof. Soumya K. Ghosh, IIT Kharagpur. NPTEL lectures on Cloud Computing, Cloud Computing Architecture, https://www.youtube.com/watch?time_continue=1&v=fZ3D6HQRWzs
- [5] Prof. Soumya K. Ghosh, Professor, IIT Kharagpur. NPTEL lectures on Cloud Computing, Utility Computing, <https://www.youtube.com/watch?v=SqG-b5E9vHs>

- [6] Literacy in India, https://en.wikipedia.org/wiki/Literacy_in_India
- [7] About Meghraj, <https://cloud.gov.in/about.php>
- [8] Cost Calculator, https://cloud.gov.in/calculator_scr1.php
- [9] Green Blizzard, Homepage, <http://greenblizzard.com/2015/10/02/how-many-trees-in-india/>
- [10] Amazon.com, Tablet approximate price that is calculated; https://www.amazon.com/gp/offer-listing/B0167OR4V0/ref=dp_olp_all_mbc?ie=UTF8&condition=all