

A Survey on School Management System on Android and Windows Integrated with Smartcard Readers

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ABSTRACT: Whole world and administrators of Educational institutions' in our country are concerned about regularity of student attendance, student's overall academic performance. Conventional methods used until now, were more time consuming and not much fruitful as parents could not keep tab on their child's daily progress. Hence, there is a requirement of school/college Management System based on android and windows integrated with SMS gateway, Smartcard readers which will notify the parents about various activities of their child from the point child swipes his/her smart card in the morning till he/she again swipes it at the time of boarding bus. In this paper, basic problem of student management in schools/colleges is defined and the main objective is to provide computer vision to it. As a prerequisite, various computerized systems being developed by using different techniques have been reviewed. This paper focuses on the advancement and modernization of the primitive methods which are being used till now in schools and colleges.

KEYWORDS: Windows, Android, Phoneygap, HTML5, JavaScript, parent-teacher communication.

I. INTRODUCTION

21st century is known as the age of science and technology. Every aspect in the world is getting modernized or automated leaving behind all the primitive methods. Now-a-days things are done over just a click of your computer or mobile and so automated modern system in schools, colleges and other educational institutions is the need of the hour. So the initiative has been taken to develop and deploy such a system at educational level which can minimize the gap between teachers and parents of the students. The main focus will be to develop a hybrid application (web technologies like HTML, CSS and Java Script) on which the attendance, performance and other activities can be monitored by the parents. The key difference is that hybrid applications are hosted inside a native application that utilizes a mobile platform's Web View[5].

HTML5 is the advanced version of the language HTML, with new elements, attributes, and behaviours. It allows client to communicate with the server innovative ways with greater speed and better usage of hardware [6]. Another language which will be used is CSS or Cascading Style Sheets that will allow to control the layout and look of page easily. CSS tags or properties are easy to use and affect the look and feel or style of pages [7]. CSS will provide the attractive and easy to use design interface. JavaScript is a high level, dynamic, and interpreted programming language and prototype-based with first-class functions, making it a multi-paradigm language, supporting object-oriented, imperative, and functional programming styles. It has an API for working with text, arrays, dates and regular expressions[8].

The system will be a multi-platform application which can be run in more than one environment like android, windows and others. The application having different views depending on the user i.e. teacher or parent/student will be linked to the hardware (RFID cards/Smart cards/Biometrics) which will provide the unique identity to every account. The account holders i.e. teachers and students will be having their own user id and password as per the hardware of the system. A database maintaining such records will interact with application using clients on front end is shown in fig 1.

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Fig 1. Database Server-Client Interaction

It will make the parents vigilant from the academics point of view about their ward as their daily activities get updated. Considering its demand it can be easily said that the application is going to be a revolutionary advancement in educational institutions once it gets launched in the store.

Paper is organized as follows. Section II describes the parent-teacher communication applications that are currently trending in market. After getting a glimpse of such applications, we move onto Section III wherein the topic multi-platform environment is discussed that gives an idea about the different OS environments. Section IV presents literature review of the papers referred. Finally, Section V presents conclusion.

II. RELATED WORK

Parent-Teacher Interaction is a domain that is being worked upon for a few years in order to reduce the gap that exists since ages. Earlier the teachers initiated this process of interaction via the SMS gateway feature on their smartphones but then giving the detailed sketch of their ward's daily progress with a proper format was tedious until the android applications came into full-fledged use.

There are 7 Innovative Applications for Parent-Teacher Communication in the market that has created quite a stir and is a perfect base to draw idea from, for our parent teacher notification application. Applications like:

1. **Remind:** Remind is a free application that allows teachers to safely send text messages to parents and students regarding classroom assignments and reminders. The text messages gets organised by subject and teachers have the option to send anything from daily affirmations to reminders about deadlines and upcoming papers.
2. **Buzzmob :** Buzzmob offers the chance to connect the entire community consisting of administrators, teachers, parents and students via a location-based platform. The application cuts down on paper costs by eliminating costly memos, connects parents to teachers with ease, sets event and deadline reminders and sends out information regarding cancellations.
3. **Class Messenger :** Class messenger is another messaging application where parents can join a class and engage in a dialogue with teachers who can send test results, reminders, photos and even videos. It can be used on a phone, computer or table.
4. **Google For Education :** Google For Education is similar to Google +, except the fact that it's for the classroom. Teachers can create a class group, create documents that can be viewed and edited by others, share information on the Cloud, video chat, launch websites, share calendars and parents can too see everything and be as involved as they want.
5. **VolunteerSpot :** VolunteerSpot is an application that helps organize group meetings, e-mails, and parent-teacher conferences, it can be used to organize school volunteers for various events, field trips and more.
6. **Mailchimp :** Mailchimp is an e-mailing service that is tailored for educational needs. It sends automated e-mails based on each parent, so if you only want one e-mail a day, you'll get only one, but if you enjoy seeing that little red number on your phone you can get as many as you want.
7. **Edmodo :** Teachers can use it to track student's progress, rapidly access their knowledge on a topic, export classroom data and create games based on learning standards, that can be shared with parents. It provides them with easy-to-

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comprehend charts that depict which students have surpassed or met their goals and which have yet to meet them [10].

There is an android student-teacher communication application mySkoolApp in PlayStore that is doing the rounds for its efficiency and functionalities, but it is platform specific(native). Therefore this gives rise to a reason where there should be platform independent application that can run on any OS once built.

III. MULTIPLATFORM ENVIRONMENT

PhoneGap

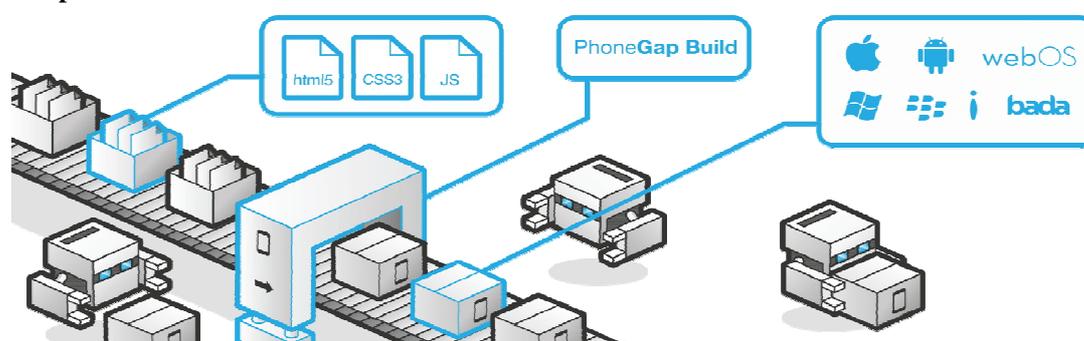


Fig 2. PhoneGap application building process

Though the market is bustling with parent teacher applications but there is hardly such application that runs on multiple platform that is a hybrid application.

Hybrid development combines the best (or worst) of both the native and web applications worlds. Hybrid as a web application, primarily built using HTML5 and JavaScript is then wrapped inside a thin native container that provides access to native platform features.

PhoneGap is such a tool that implements this new hybrid application idea and helps programmers to save their efforts of rewriting the code for different OS running on mobile. It, in short, reduces time, cost and space in developing a platform independent application and follows the principle 'Write Once, Run Everywhere' ardently.

- Supports iOS, Android, Windows, Blackberry, Firefox OS and others.
- Uses common web development technologies: JavaScript, HTML5 and CSS.
- 100 percent of code reuse is possible [13].

Android

Android is a mobile operating system (OS) developed by Google, based on the Linux kernel and designed basically for touchscreen mobile devices such as smartphones and tablets, its user interface is based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input.

Internal hardware such as accelerometers, gyroscopes and proximity sensors are used by some applications to respond to user actions [11].

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Fig 3. Android Home Page



Fig 4. Android Logo



Fig 5. Android Play Store

Windows

Windows Phone (WP) is a family of mobile operating systems developed by Microsoft for smartphones as the replacement successor to Windows Mobile and Zune. It is based on 'Metro design language'. The home screen (Start Screen) is made up of Live Tiles (links to applications, features, functions and individual items) that are dynamic and update in real time. It uses multi-touch technology, it has dark theme that prolongs battery life on OLED screens [12].



Fig 6. Windows Home Page



Fig 7. Windows Logo

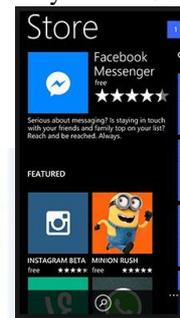


Fig 8. Windows Phone Store

IV. LITERATURE REVIEW

- **Smart phones permitted : How teachers use text messaging to collaborate**

Authors : Yousuf Hasan, Mustafa Zaidi, Najmi Haider , W.U.Hasan and I.Amin

This paper talks about knowledge sharing and collaboration opportunities amongst teachers, para-professionals, related service providers, and parents when face-to-face time is not available.

Pros : SMS to maintain contact with parents regarding daily update of their ward's progress

Cons : Issue of lack of Information System shaped by the interaction among people, resources and contexts in the particular school setting [1].

- **Parent personal information system to improve parental involvement in children's learning process in elementary school**

Authors : Kamaruddin, A., Nagalingam, S.V.A.L., Admodisastro, N., Md Rasid, N.S.

This paper highlights two parts: to identify the system requirements using the Problem Pyramid and to design a better personal information management using mobile platform to support parental engagement.

Pros : To enhance parental engagement, by communicating with parent regularly through an efficient and effective communication system that will allow parent to be informed and involved is necessary.

Cons : No parental involvement in secondary school children' curriculum has been discussed [2].

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- **Computer mediated parent-teacher communication**

Authors : Susana Juniu

This paper analyses the prevalent parent-teacher communication in a K-12 educational setting, exploring various communication options to improve such communication. It examines the benefits of combining traditional synchronous and asynchronous communication with newer communication technologies.

Pros : It discusses about the tools that can be used to increase parent-teacher interaction like email, online grading, online calendar, webpage, chat.

Cons : Significant number of families may not have access to technology-based communication Tools [9].

- **Smart Phones Application development using HTML5 and related technologies: A tradeoff between cost and quality**

Authors : Yousuf Hasan, Mustafa Zaidi, Najmi Haider, W.U.Hasan and I.Amin

This paper evaluates HTML5 based applications against the quality factors like Functionality, Usability, Efficiency, Maintainability, Reliability and Portability. It also discusses the possible cost effectiveness of HTML5 based applications in comparison with native application development.

Pros : HTML5 Based applications can be built in less time as compared to others and can be run on multiple platforms.

Cons : Some features are not of that calibre due to the staggered working persistence issues of device API's on Native HTML5 based applications [3].

- **Challenges and Issues in Android Application Development- An Overview**

Authors : Deepa V. Jose, Lakshmi Priya C, G. Priyadarshini and Monisha Singh

This paper talks about using the Java language, the Eclipse platform, android ADT and the android SDK to develop the mobile application for food ordering system that has a nice interface and smooth operation. Besides, it won't steal any personal information and bring a wonderful user experience.

Pros : It is customer-centric application that uses advanced technologies to improve service quality and has attracted much attention in this application.

Cons : The software/hardware integration is a major issue. Fixing the errors and security issues were also quite difficult to manage [11].

V. CONCLUSION AND FUTURE WORK

In this paper, we have described the overview of "Automated School Management System". All the analysis on HTML5, CSS, Android, Java Script is done and based on these, the application building program has been initiated and its functionalities are strictly focused on the transparency between parent and teacher. A dedicated server operated by an admin is implemented to maintain and monitor records of the client. The database consists of details with respect to students, parents and teachers which is controlled by the admin. The security factors are considered while sending daily notifications as it is a parent teacher notification system. The system when implemented will be very beneficial as well as convenient to every parent. This paper is very useful for new researchers for the study of various methods and to get a glance of current scenario in deployment of such a system in real time.

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