

Attendance Application for GEC Bilaspur using Android and Google Sheets

Kabir Mishra¹, Rupesh Gupta², Sanchita Chourawar³

B.E. 3rd Year Student, Computer Science & Engineering, Government Engineering College, Bilaspur, India¹⁻³

Abstract: Google Spreadsheet is a powerful tool to manage student records online. It is more than a Web 2.0 version of Microsoft Excel as it performs many functions that are not available in Excel. One of many uses of Google Spreadsheets that could be useful to lecturers is managing students' grades and attendance online. In this paper, the author wishes to present his innovative ways of managing students' grades and attendance records using the wonder of Google Spreadsheet. In order to experiment with the Google way of doing things, the author embarked on a self-directed learning journey of discovering the functionality of the tools. By immersing himself with hundreds of syntax used to create functions in Google Spreadsheet, he managed to create a number of potentially useful innovations, Java is one of the world's most important and widely used computer languages, and it has held this distinction for many years. Unlike some other computer languages whose influence has worn with the passage of time, while Java's has grown. Java is a high level, robust, object-oriented, and a secure and stable programming language but it is not a pure object-oriented language because it supports primitive data types like int, char etc. Java is a platform-independent language because it has runtime environments i.e. JRE and API. Here platform means a hardware or software environment in which application runs. Java codes are compiled into byte code or machine-independent code. This byte code is run on JVM (Java Virtual Machine). The syntax in Java is almost the same as C/C++. But java does not support low-level programming functions like pointers. The codes in Java are always written in the form of Classes and objects. As of 2020, Java is one of the most popular programming languages in use, especially for the client-server web applications. It has been estimated that there are around nine million Java developers inside the world.

Keywords: Google Spreadsheet, Java, JVM, JRE, API

I. INTRODUCTION

Attendance management is important to every single organization; it can decide whether or not an organization such as educational institutions, public or private sectors will be successful in the future. Organizations will have to keep a track of people within the organization such as employees and students to maximize their performance. Managing student attendance during lecture periods has become a difficult challenge. The ability to compute the attendance percentage becomes a major task as manual computation produces errors, and wastes a lot of time.

Why attendance app? Why are organizations anxious to exit manual/outdated attendance processes?

Consider these 10 benefits for making the switch:

1. Accuracy Humans are prone to error, even if we provide them with supporting computational devices. Automated attendance management systems ensure accurate time records and minimize the inevitable and costly errors with manual data entry. This accurate data thereby helps to provide accurate performance and payroll data.
2. Economics Have you ever thought that attendance management systems could control costs? It saves money by putting an end to inaccurate time reporting, buddy punching, absenteeism, tardiness, time abuse, and overpayment. As a matter of fact, a study done by the Axsium Group found that large organizations save up to \$1,600 per employee after implementing automated attendance management systems.
3. Productivity / Efficiency Monitoring and managing attendance manually can be a time-consuming, laborious, and expensive affair. It takes time to process paper sheets and time cards, create schedules, authorize leave and overtime, and create payroll manually. Free up precious administration time with an automated system that does it all for you, from keeping track of employee hours to automatically importing information into your payroll system. The time and effort saved combined with data accuracy helps in optimizing the use of resources which lead to increased productivity and improves profits.
4. Visibility / Insights Would you need a quick snapshot of all planned and unplanned absences for an employee or group? With just a few clicks, you can generate accurate reports on hours worked, absences, overtime, get a monthly summary report for any of the data/groups within the organization. Any customized report can be generated with the centralized data which improves visibility and transparency within the organization. Managers can also make use of the graphical views of the report to get a quick and easy understanding of attendance data. With a centralized, accurate attendance data hub, employers can strategically analyze and improve policies on leave, hours, workplace culture, performance, pay, etc., thereby enabling them to mature in the way they operate.

5. **Hassle Free Workflow Management** An integrated attendance management system can provide good visibility of all data and can ease the workflow of payrolls, leaves and performance reviews. Notifications/alerts are automated and the manager can approve requests for early departure, overtime, etc., immediately without any specific need for communication. Forget the herculean task of manual scheduling. With just a few clicks, an automated attendance management system can help manage schedules, allocate work, and easily keep track of shift swaps. It can also help you to forecast workloads, resources, and budgets.
6. **Flexibility** In today's global, well-connected environment, you have employees working from office, from home, or at remote locations. An attendance management system allows organizations to track employee time using a variety of clocking options, such as smartphones, internet networks, swiping technologies, biometric terminals or desktop readers easily.
7. **Integration / Configuration** You can choose attendance management systems to suit your needs based on the nature of work and policies. There are systems available which can be integrated with any third-party attendance hardware (swipe, biometric), and which can capture GPS-based attendance with mobile applications. You can create customized attendance policies as per your organizational needs with time tracking and attendance monitoring systems. You can have individual configurations for each attendance shift, with options to define attendance cycles, mark-in/out rules, leave deductions, and optional holidays.
8. **Real-time tracking** Cloud-based attendance management enables real-time tracking and provides automated inputs for payroll processing. This helps in managing alternative payment schedules and makes all information available in real time. Managers can create "scheduled versus actual" reports to adjust work schedules and direct workforce activities in real time.
9. **Security** Most attendance management systems are built around highly secure systems and architecture. Specifically, biometric systems are highly reliable and secure and can help prevent time theft, buddy punching and reduce administrative costs stemming from forgotten PINs and lost ID cards. These systems are of particular utility to organizations where security is a primary concern.
10. **Compliance** Inaccurate records can cost your organization a lot of money in overtime payment, and can also violate labor laws, resulting in expensive legal defence and fines. Regulations require that employers track attendance and provide the necessary compensation to their employees for any excess hours worked in the spirit of fairness. An attendance management system that integrates with your payroll simplifies this process while making it seamless.

II. LITERATURE REVIEW

One of the most difficult tasks of system Analysis is Identification of Need i.e. developing a clear, in-depth understanding of the problem being investigated without which it becomes impossible to specify the requirements for new projects with accuracy while identifying the need following things should be kept in mind:

- The performance of the system.
- The information is supplied and it is from.
- The economy of processing.
- The control of information processing.
- The efficiency of the existing System.
- The security of the Data and software.
- The security of the equipment and personnel, etc.

After identification of Need, it is defined and a general direction or method for solving is also determined. The project boundaries are defined. while Identifying the needs for developing the Integrated Traffic solution the following few things were kept in mind:-

1. The input Screen should be user friendly, the project which is being developed for the integrated Traffic Solution staff must be User Friendly, the staff (after giving training) must handle the software. Otherwise what the use of developing such software That staff is unable to handle.
2. The existing system is not user-friendly because the retrieval of data is very slow. The current system consumes more time. For a computer system, it is hard for the faculty to carry along with them. All problems of the existing system are taken into account; the new optimized system with automation is used in this project.

III. ARCHITECTURE

Our project on Attendance Management System is based on some concepts and methodologies that we devised during our initial study and visualization of the project. We have planned our project keeping in mind the Object-Oriented Concepts that can be applied to the project. The project is strongly supported at the back end by Java-the the most popular and successful object-oriented programming language. The front end is developed using Extensible Mark-up Language (XML). The initial idea was to improve the attendance system which is being in use for the past decades. The idea was to develop an application that would be portable enough so as to carry it to the classrooms as an attendance register. This



stuck us with an idea of developing an android application which can be easily installed in an Android enabled cell-phone and be used seamlessly by a teacher while taking the roll calls. In this process, we designed a database for the application. It contains various tables like register, subjects, students, and attendance for various purposes. These tables hold data for particular purposes which shall be dealt with later. The flow includes the addition of subjects by the teacher and then adding the students to the respective subjects. When a subject becomes ready it is then visible in the selection area for giving attendance, checking the percentage, and even checking the date wise attendance. The attendance can be checked periodically, date wise, or as desired by the teacher. The final attendance can then be used for various purposes.

3.2 Android Studio Android Studio: Android Studio is the official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA . On top of IntelliJ's powerful code editor and developer tools, Android Studio offers even more features that enhance your productivity when building Android apps, such as:

- A flexible Gradle-based build system
- A fast and feature-rich emulator
- A unified environment where you can develop for all Android devices
- Apply Changes to push code and resource changes to your running app without restarting your app
- Code templates and GitHub integration to help you build common app features and import sample code
- Extensive testing tools and frameworks
- Lint tools to catch performance, usability, version compatibility, and other problems
- C++ and NDK support

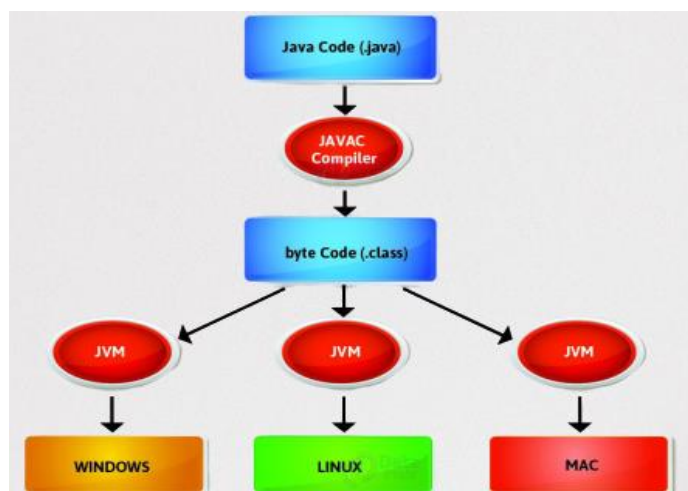
Built-in support for Google Cloud Platform, making it easy to integrate Google Cloud Messaging and App Engine

3.3 XML & Java XML: Declare UI elements in XML. Android provides a straightforward XML vocabulary that corresponds to the View classes and subclasses, such as those for widgets and layouts. Declaring your UI in XML allows you to separate the presentation of your app from the code that controls its behavior. Using XML files also makes it easy to provide different layouts for different screen sizes and orientations. Using Android's XML vocabulary, you can quickly design UI layouts and the screen elements they contain, in the same way, you create web pages in HTML — with a series of nested elements. Each layout file must contain exactly one root element, which must be a View or ViewGroup object. Once you've defined the root element, you can add additional layout objects or widgets as child elements to gradually build a View hierarchy that defines your layout.

Java Logics: Java is the technology of choice for building applications using managed code that can execute on mobile devices. Android is an open-source software platform and a Linux-based operating system for mobile devices. The Android platform allows developers to write managed code using Java to manage and control the Android device. Android applications can be developed by using the Java programming language and the Android SDK. So, familiarity with the basics of the Java programming language is a prerequisite for programming on the Android platform. This article discusses where Java fits in mobile application development and how we can use Java and Android SDK to write applications that can work on Android devices.

15 Principles: There were five primary goals in the creation of the Java language:

1. It must be simple, object-oriented, and familiar.
2. It must be robust and secure.
3. It must be architecture-neutral and portable.
4. It must execute with high performance.
5. It must be interpreted, threaded, and dynamic.



There is no doubt that an attendance management system will help save time and money by eliminating a lot of manual processes involved in attendance and leave entry and calculating hours attended. With automatic class attendance system, teachers can more accurately and quickly track student's time on the classroom. Here are the top ten advantages of

implementing Time & Attendance Management solution

Reduce paperwork and save time and money with mobile app attendance management system

Eliminate duplicate data entry and errors in time and attendance entries

Improve visibility to track and manage student attendance & absenteeism across multiple campuses

Real-time status tracking of leave requests

Automatic calculation of leave and reward points accrued

Easy attendance recording using mobile-based attendance system

Track the attendance of students assign work and manage the allocation

Keep the parents informed about the student's performance via Email & SMS alerts

Auto-generate various types of reports of class or student attendance

Increased security and confidentiality with role-based permissions to users

Creatrix Campus Attendance Management System provides a powerful mobile app solution for schools and higher education institutions to reduce staff workload and improve efficiencies with time in attendance system.

It works to ensure attendance is maintained by performing a cycle of activities that analyzes student absences look for solutions to correct, sets targets for improvement, seeks working interventions, and finally assesses solutions

At every class, the teacher has to mark attendance using the web and mobile devices

Analyze attendance data

Identify absent & tardy students

Share attendance records with parents

Generate daily/weekly/monthly attendance reports for students to set attendance goals

Communication students with parents

Try out disciplinary interventions to improve attendance

Set up a reward system to promote positive attendance

Assess what makes for good attendance

Attendance Management Software manages the attendance of all the students reading in an organization to make hassle-free operations

Benefits of Attendance Management Software: It is accurate and reliable.

It is flexible

It is error-free.

It is fast work.

It is user friendly.

It will be easy to understand.

It can add the name of multiple students

It is helpful for an organization to evaluate student attendance during the month-end.

Reduces paperwork and human error

Some of these popular attendance management systems include all the features mentioned and more.

This app more than just attendance tracking and includes other functionalities like time management, leave management, and real-time reports.

Automate Payroll processing from timesheet reports and save money.

Get Online student attendance reports that include lateness, absence, and performance reports.

This app will run only through the internet

And the time we are taking the results, it can be seen anytime without the internet.

This app is too small in size

This app will run smoothly on Android phones

This app will work on any Android phone and this phone will work on 512 MB RAM in the same way as it works on 8 GB RAM.

This app will be better than other apps and even during running

This app's database will be stored in Google Sheets'

This app is very easy to run and understand, any user can learn and run this app once

V. CONCLUSION

The Mobile Based Attendance Management System is developed using Android studio: XML Design, Java Logics. fully meets the objectives of the system which it has been developed. The system has reached a steady state where all bugs have been eliminated. The system is operated at a high level of efficiency and all the teachers and user associated with the system understands its advantage. The system solves the problem. It was intended to solve as requirement specification. The attendance system through mobile devices is a very effective tool which can be used to a great extent.

The system is portable and can be easily installed and used on any mobile phones supporting Android OS. In this paper we have proposed that attendance has been taken in the digitalized way. This work is to access the details about the student information and generate reports. The project “Mobile Based Attendance Management System” is a collection of static and dynamic pages. This project offers user to enter the data through simple and interactive forms. This is very helpful for the students and staff members to keep and maintain the information about students easily. This app helps the faculties to reduce their work stress by reducing the time and calculations required to update the attendance manually. The various levels of management personals are utilizing the app in variety of ways like, viewing the attendance, performance details of students. By using this optimized mobile app, 24/7 the management personals are accessing the information for various decision-making analysis.

ACKNOWLEDGMENT

There is always inspiration gained by many in the completion of work. This project is made possible with the guidance of our mentor Professor **Sanchita Chourawar**(Assistant professor, Department of Computer Science & Engineering). We are thankful to our respected Head Of the Department Professor **Sourabh Yadav** (Department of Computer Science & Engineering) for providing us with all the necessary facilities and also grateful to our Head Of Institute **Dr. B S Chawla** Sir(Principal, Government Engineering College, Bilaspur) for his motivation and encouragement for this research to be successful

REFERENCES

- [1]. <https://developer.android.com/>
- [2]. Introduction to Java Programming: Liang, Pearson Education, 7 th Edition.
- [3]. Java The complete reference: Herbert Schildt, TMH, 5 th Edition
- [4]. Java Programming Advanced Topics: Wigglesworth, Cengage Learning.
- [5]. Head First Android- By Jonathan Simon
- [6]. Android Programming: Mastering Course for Beginners Quick Start to Develop Your Own App” by Mitchell Schuler

BIOGRAPHY



Mr. Kabir Mishra pursuing Bachelor of Engineering [2017-2021] with major in Computer Science and Engineering from Government Engineering College, Bilaspur (C.G) Affiliated to Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G).Good in Java and Proficient Android developer.



Mr. Rupesh Gupta pursuing Bachelor of Engineering [2017-2021] with major in Computer Science and Engineering from Government Engineering College, Bilaspur (C.G) Affiliated to Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G).Good in Java and Proficient Android developer.



Miss Sanchita Chourawar pursued B.E from University of Bhilai in 2013 and Master of technology from RGPV University in year2018. She is currently working as Assistant Professor in Department of Computer Science Engineering, Government Engineering College, Bilaspur(C.G.) . She is a research work focuses on Cloud Security and Privacy, Big Data Analytics, Data Mining, IoT and Computational Intelligence based education. She has 2.5 years of teaching experience.