Mobility Based Learning and Schedule Management

[1] Robin Tommy [2] Hima Jose [3] Jitendra Notnani [4] Arun Jose [5] Meera Raghunath [6] Kaustav Chakraborty

ILP Innovations

Tata Consultancy Services

Trivandrum

[1]robin.tommy [2]hima.jose [3] jitendra.notnani [4]a.jos [5] meera.raghunath [6] chakraborty.kaustav@tcs.com

Abstract - The impact of mobile applications in today's world is immense. Our platform is a mobility based application that is being used by all the trainees and officials alike in the Learning Domain. It is a location dependent application with its primary use being helping the users in getting their day to day training schedule. Various other features like dynamic location based disaster information collection, location tracking are enabled in the app. It has a notification and live feedback feature. A gamification factor is also incorporated into the app. The application also has emergency contacts that changes dynamically based on the registered location. Augmented reality based learning and live quizzing is also available.

Keywords-component; android; mobility; mobile-apps; windows; geospatial; augmented reality; gamification; live-feedbacks; saftey;

I. INTRODUCTION

The modern age has seen a huge growth in the use of mobile and mobile applications. Mobile application development is one of the fast growing segment in the field of Information, Technology and Communication [7]. This huge success of smartphones and its applications attribute to the easy, cheap and user friendly nature in which they can be brought and used. The smartphone industry has seen advancements in various fields and applications in diverse fields and performing various functions has been developed. The users of mobile apps has increased from 400 million in 2007 to 1800 million in 2014[1]. Most of the mobile applications developed will run on all the mobiles in that platform irrespective of the cost and configuration of the mobiles. This makes mobiles a stupendous success among all categories of people.

The current mobile phones has a computing power almost similar to a normal desktop PC or a laptop making mobile phones do anything. Mobile phones as compared to computers are small, moveable, easy to use and inexpensive. Mobile applications are also easy to download and use. Now a days, people use mobile applications for a lot of things like calling or messaging people, taking pictures or videos, browse internet, document creation etc. Mobile applications are not only used for personal purposes but also they are extensively used in the business domain. In fact a lot of companies make millions of dollars every year from the mobility domain.

In the first stage i.e. around 9 years back mobile phones only had a few number of features like calling, messaging, setting alarm etc. But things has changed now. The android

Platform itself has over 1.9 million applications as of Q1 2016 [9]. Also the number of fields in which these applications are developed has also become very large. There are mobile applications in almost all the current fields. Extensive market research is happening to make people download more applications. Also the technological research happening in this field is also tremendous. The major platforms in which mobile applications are being developed and their market share is as follows: Android 82.8%, iOS 13.9%, Windows Phone 2.6%, others 0.4% [10]. Some of the categories in which mobile applications are being developed are:

- Communications: Internet Browsing, email client, Social Networking

- Games: Puzzle/Strategy, Cards/Casino, Action/ Adventure

- Multimedia: Graphics/Image viewer, Video Players, Audio players

- Productivity: Calendars, Calculators, Diary, Notepad /Memo/Word Processors, Spreadsheets

- Utilities: Address book, Task manager, Call manager, File manager [7].

Currently there are many application in the learning management domain. Each one of them has its own advantages and disadvantages. There are many applications which provide feedbacks, gamifications, augmented reality based learning etc. The problem here is that no application is able to cater to all the needs present in the learning domains and also their reach is small. This makes the users to download and use multiple applications to manage a single training course. This is not a feasible solution.

Our application is an integrated learning management tool which has many of the features needed for the plain sailing of trainings across domains. It also has many other additional features that constitute to the smooth functioning of these trainings.

The basic functionality of our application is to provide schedules of the training sessions. Along with that it provide provisions to give live feedback to the sessions and also send notifications to each of the training batches separately. It has a dynamic location based disaster management system and safety feature along with emergency contacts helping the trainees in circumventing any dangerous or difficult situations they face during their training period. The geo spatial intelligence feature helps the associates find out the nearby amenities easily and also to locate themselves in case they get lost. It also has a live quiz feature which can be used instantaneously during sessions by the faculties to make sure that the training is going in the desired direction and the trainees are paying attention and grasping the ideas that are being taught. Gamification is implemented to encourage the associates to give feedbacks more frequently. The trainees are awarded with badges according to the number of feedbacks. Augmented reality based learning is yet another feature that will enhance the learning experience of the students and make them use the virtual learning experience in a more effective way.

II. RELATED WORK

Our learning application is an integrated utility platform for the users which provides a lot of features and give them a distinctive user experience. Our mobility application furnishes features like schedules, augmented reality based learning, live feedbacks, safety features, live quizzes etc. Even though there are many application that have many of the features put forward by our app, none of them has integrated it into a single platform so that it can be used by the ILP associates with ease. There are many applications like 'schedule Planner Classic' which lets the user to create schedules or plans and add notes or notifications for those tasks [2]. But it does not cater to our needs. The primary feature of our application is displaying schedules of the training programs which was previously available not available online or was available over the internal networks into the reach of everyone. Also it gives the user provision to submit feedbacks to all the sessions given in the schedules, so that when the session owner logs in he/she will be able to see the number of feedbacks he has received and the average rating along with the comments.

Live quizzing applications are present in abundance in the smart phone apps world. 'Socrative' is a web application which provides live quizzing feature [3]. But the main problem with socrative is that it does not have a mobile application and the user should always log into the system with his credentials to access the page. Also it does not provide a location specific indication to the quiz maker as to how many people has answered from each of the registered locations separately. Our application has a quizzer option available in the app known as iBuzzer, so that the users can attend live quiz during sessions to understand their knowledge level and keep them engaged in the session. It also has a web portal associated along with the app from which the session takers can set quizzes before taking the session. During the session they can activate the questions either from the mobile app or the web portal associated with the application. The session taker then will be able to see the number of associates answering from various locations and the answers they choose.

Safety is one of the major concerns in today's world. To ensure that everyone is safe or to notify the authorities a lot of safety applications are in place. Many of such application focus on women safety. These safety applications has various features for ensuring safety. 'Watch over Me' is an application that lets you set scenarios and give a time frame to it. If you fail to check into the application when the time frame ends, it sends messages/mails et al. along with your current GPS location to a predefined set of friends [4]. Another application 'be Safe' is also similar to Watch over Me which sends messages to a predefined set of numbers in case of an emergency. It also has an SOS button when clicked it sends alerts to the pre-defined numbers and calls a number. Along with that it sounds an alarm and sets of a bright light on your phone [4]. In our application there is a feature similar to the above mentioned apps to send alerts whenever the user clicks on the emergency icon. Also if a natural calamity or disaster occurs at any place we can trigger a safety feature which ask whether you any help. If you click yes it asks for the type of help and sent this as alerts to the set of numbers. Also an admin for the application can see these requests for help through a web portal and mark the resolved issues marked.

III. IMPLEMENTATIONS

The application is a mobile app that is developed to help the learning and learning domains in learning and schedule management. Initially the users are asked to register in the application using their name, and unique credentials given at the starting of the training along with the registered location. The user is then registered and the application adapts itself according to the location given by each user.
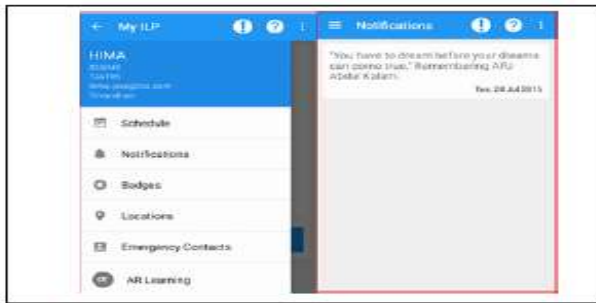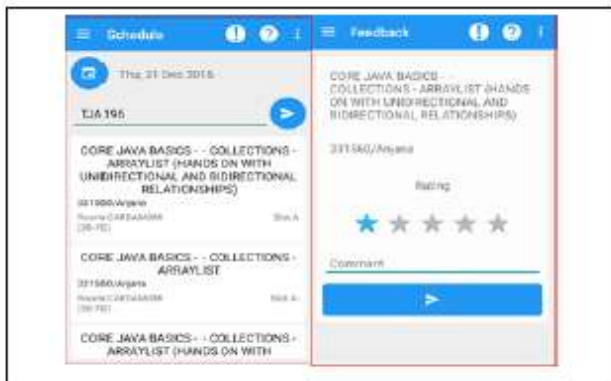
Figure 1. Menu Page.

Figure 2. Schedule and feedbacks page.

The application provides the registered associates details about their everyday sessions, its venue, the faculty and the slot. Earlier there were limited options for the session takers/faculties to get the feedback of each of their sessions separately. The feedbacks for all the sessions were submitted collectively by the associates after their training completion. This happened almost 1.5 to 2 months after the actual session was taken. So this data was not reliable. But using our application the trainees can give rating and comments for the sessions just by clicking on the sessions given in the schedule. i.e. they can provide live ratings and

comments to all the sessions. When the faculty clicks on the same session details section in the app he will be able to see the feedbacks given for him.

Once a schedule is loaded it is stored in the locally in the phone so that everyone can access it without using internet. In order to encourage the trainees to give feedback a gamification mechanism is also included i.e. they will get points based on the number of feedbacks they submit and based on that they will be awarded with badges.

The next feature is the emergency contacts. Based on their training location important contacts will be downloaded and stored offline when they first load the app. When they face a situation in which they need an official help or a situation occurs to call the police et al they can use this feature. By clicking an emergency contact number they can directly call or message that number from the application.

Figure 3. Emergency Contacts & Badges

The app provides disaster recovery information management system for associates during natural calamities. This app has also a feature to send push notifications to the user. Earlier all the notifications given to the trainees were printed on a paper to be readout in the class but now we can directly sent the notification to each and every user based on their registered batches. This feature reduces the paper wastage and decrease the manual effort put into sending out the notifications to all the classes/training rooms.

The location tab gives you your current location along with the location of your ILPs and hostels. It also has a navigation option using which you can go to all the nearby place of interest including ATMs, Banks, Restaurants, Hospitals, etc.
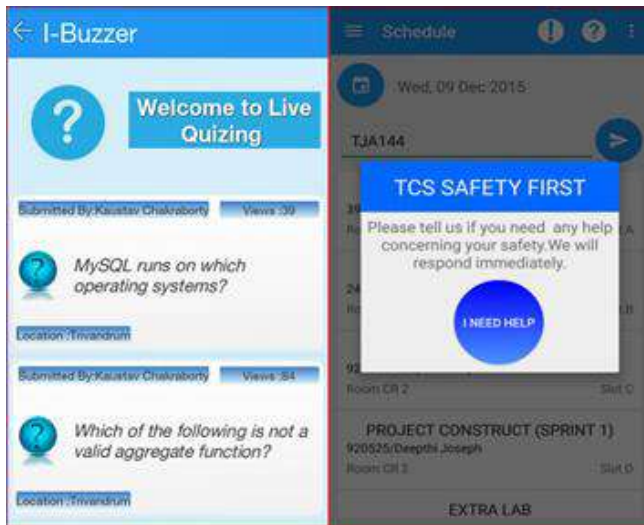
Figure 4. iBuzzer & Dynamic disaster management system.

The augmented reality feature is introduced to give the trainees a real hands on experience on AR for learning. One of the trainee case studies has been integrated as an augmented reality feature into the app. Now when they focus the app on the given pattern a short video explaining the case study will start to play. After that they will be given with buttons in the augmented world to get detailed information on the case study.
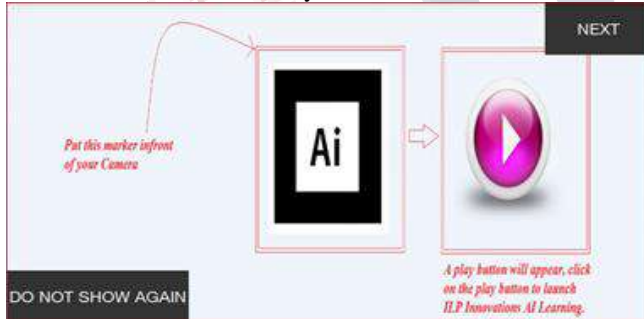

Figure 5. Augmented Reality based Learning.

There is a quizzer option available in the app known as iBuzzer, so that the associates can attend live quiz during the session to understand their knowledge level and keep them engaged in the session. The faculty can activate/deactivate the questions dynamically through the application or the web portal provided with the application. The faculties then will be able to see the number of associates answering from various locations and the answers they choose and revamp the sessions accordingly to get maximum results. Overall this is a single mobile platform for faculties and associates to engage and learn in the new technological scenario.

IV. BENFITS AND RESULTS

The application became a huge success among the trainees and faculties across locations. The application helped in saving time in a lot of aspects and it provided the trainees an enhanced virtual learning environment. Till now trainees and faculties across different locations has used our application to access their training schedule from their homes to plan their day ahead. This saved a lot of time as the trainees and faculties would now be aware of any sudden changes in the training schedules, venue etc. This will help them in conserving their valuable time.

Another important benefit of our application is that it reduces paper wastage. Earlier notifications to the associates were printed on paper and read out in class. This lead to many problems like the absence of associates from class when the notice is read out or the lack of proper manpower to go through all the classes. Now after the implementation of the learning management application all notifications are sent to the registered mobile. This ensures that the trainees are made aware of all the notices promptly finally reducing the wastage of paper and extra manpower.

Earlier feedbacks for each sessions were given either through paper and pen which they used to submit weeks after the session diminishing its value or by logging in into a web portal where the feedbacks were submitted. The former method makes the analysis of the feedbacks difficult and also the whole purpose of giving feedbacks were also lost since by the time we go through them and come into consensus the training itself can almost come to an end. The latter method also ask the trainees to go to a web page to give feedback. This also takes a lot of time as they have to login, give comments, send mail etc depending on the system which is used to obtain the feedbacks. The live feedback and rating option in our system enables the associates to provide feedback soon after the session is over in less than 5 minutes. Thus reducing the total time spent by them in giving feedbacks. The faculties are now able to understand the pulse and feedback of the crowd instantly using the app which leads to an improvised session management.

The live and instantaneous disaster recovery information management system helped a lot of associates in contacting the involved stakeholders and save themselves from unfortunate incidents.

Integrating geo spatial intelligence into the application helped the associates who are new to the location to find out places and basic amenities around them and also to locate or navigate back to their training centers.

The augmented reality based learning application gives the trainees an enhanced learning experience and this can make their course more engaging and allowing the associate to interact with digital information embedded in the physical environment [6].

The emergency contacts feature which is localized for each location gives the associates a platform from which

he can easily access all the emergency numbers. The gamification factor added into the application in the form of badges prompts the associates to give maximum number of feedbacks. iBuzzer or the live quiz feature helps the faculty to set up live instantaneous quizzes during sessions to check the understanding of the associates and restructure the sessions to get maximum output.

Our application which was developed for the training domain helped in increasing engagement from associates and improving session delivery management. Also it helped in efficient information management and providing faster access to every associates on time.

REFERENCES

[1] Greg Sterling, " Morgan Stanley: No Apps Aren't Winning. Mobile Browser Is", http://marketingland.com/morgan-stanley-no-apps-arent-winning-the-mobile-browser-is-144303, Sept 2015.

[2] Google Play Store,
https://play.google.com/store/apps/details?id=com.intersog.android.schedule&hl=en, Jan 2016.

[3] Google Play Store,
https://play.google.com/store/apps/details?id=com.quizup.core&hl=en, Jan 2016.

[4] Amber Bouman, "5 personal seftey apps that watch your back," http://www.pcworld.com/article/2057930/5-personal-safety-apps-that-watch-your-back.html, Oct 2013.

[5] Dunleavy, M., & Dede, C. (in press). Augmented reality teaching and learning. in The Handbook of Research for Educational Communications and Technology (4th ed.), J.M. Spector, M.D Merrill, J. Elen, & M.J. Bishop (Eds.), New York: Springer.

[6] Azuma, R., Baillot, Y., Behringer, R., Feiner, S., Julier, S., & MacIntyre, B. (2001). "Recent advances in augmented reality. IEEE Computer Graphics and Applications". 21 (6), Computer Society Press Los Alamitos, CA, USA, pp 34 – 47.

[7] Md. Rashedul Islam , Md. Rofiqul Islam , Tahidul Arafhin Mazumder, "Mobile Application and its Global Impact," International Journal of Engineering & Technology IJET-IJENS, Dec 2010, Vol: 10 No: 06, pp 104-111.

[8] Katarzyna Wac, Selim Ickin, Jin-Hyuk Hong, Lucjan Janowski, Mar kus Fiedler, Anind K. Dey, "Studying the Experience of Mobile Applications Used in Different Contexts of Daily Life," Unpublished.

[9] "Number of Android applications Q1 2015", AppBrain Stats. AppBrain. Jan 2015.

[10] IDC Research Inc., "Smartphone OS Market Shae, 2015 Q2," http://www.idc.com/prodserv/smartphone-os-market-share.jsp, Aug 2015.

[11] Li Ma, Lei Gu & Jin Wang, "Research and Development of Mobile Application for Android Platform," International Journal of Multimedia and Ubiquitous Engineering, Vol.9, No.4 (2014), pp.1 87-1 98.

[12] N. P. Huy, D. Thanh, "Developing apps for mobile phones", 7th International Conference on Computing and Convergence Technology (ICCCT), IEEE, 2012, pp. 907 – 912.

[13] Kurt D. Squire , Mingfong Jan, "Mad City Mystery: Developing Scientific Argumentation Skills with a Place-based Augmented Reality Game on Handheld Computers," Journal of Science Education and Technology, February 2007, Volume 16, Issue 1, pp 5-29.