



Engagement Mobile Apps For Students



Introduction

Our client, an EdTech company, is working on making deep impact to the education sector in India. Currently all the learning centers – schools, colleges and universities – impart teaching through a classroom mode. In the classroom, teacher is the primary source of information and learners passively receive it. Knowledge is captured and distributed in the form of books, which are expensive sometimes and not easily accessible to all. The classrooms are relatively isolated, and collaboration is limited to other students in the same classroom or building. These fundamental concepts and notions of education systems are being challenged and revolutionized through the innovative business model of our client.

They have built a platform, using which colleges and universities are able to convert their classrooms into places that are a blend of online and face-to-face interaction and where knowledge is getting created instead of being consumed. This platform helps educators create online content from resources available in internet, which they are able to push to students for online consumption. So, educators are able to use class time, for advance problem-solving, communication and collaboration, instead of merely spoon-feeding information.

Students are having more control on what they use to help them learn. They can leverage the platform to direct their learning to the topic of their interests and also to self-pace their learning. Increasingly students access content online, outside the classroom as their homework and then use this knowledge in the classroom by engaging in active learning practices such as discussion or group work. They also collaborate on their subject of interest, outside their universities and colleges. Finally, students can identify newer opportunities in the forms of internship projects or jobs through the platform.

Our client has independently built the back-end platform and also the web application to use it. But to access the web application, students need to use their laptop, which they do only for a selected period of time. On the other hand, students are on their mobile phones for a longer duration and go to their smartphones when they want to discover something. So, our client decided to bringing mobility inside and outside the classroom, to connect the students to their platform conveniently. They engaged us to build a mobile app that can render an immediate, fast and smooth experience for a wide range of activities.

The Need

Millennial students are ever connected and ever on, even when they are on the move. In the course of a day, students have many **micro-moments** when they reflexively turn to their smartphones to act on a need to learn something, do something, discover something, watch something or buy something. These are intent rich moments when decisions are made, and preference shaped. During the occurrence of such moments, our client would

like to inset, through their mobile app, into the life of the student. They would like to influence the career decision of the students, carve the path forward and also guide students throughout this journey.

However, merely building a mobile app is not enough. It has to be engaging for the student on a daily basis and throughout the semester. Students should feel this app is useful, addictive and indispensable. It should also be very personal for the student, even if it includes few details and don't explicitly spell out their request. Moreover, millennial students are curious and research-obsessed about small stuff, continuously finding new information and making small decisions faster than ever. So, the app should provide them with all necessary information and help them act on their decisions efficiently.

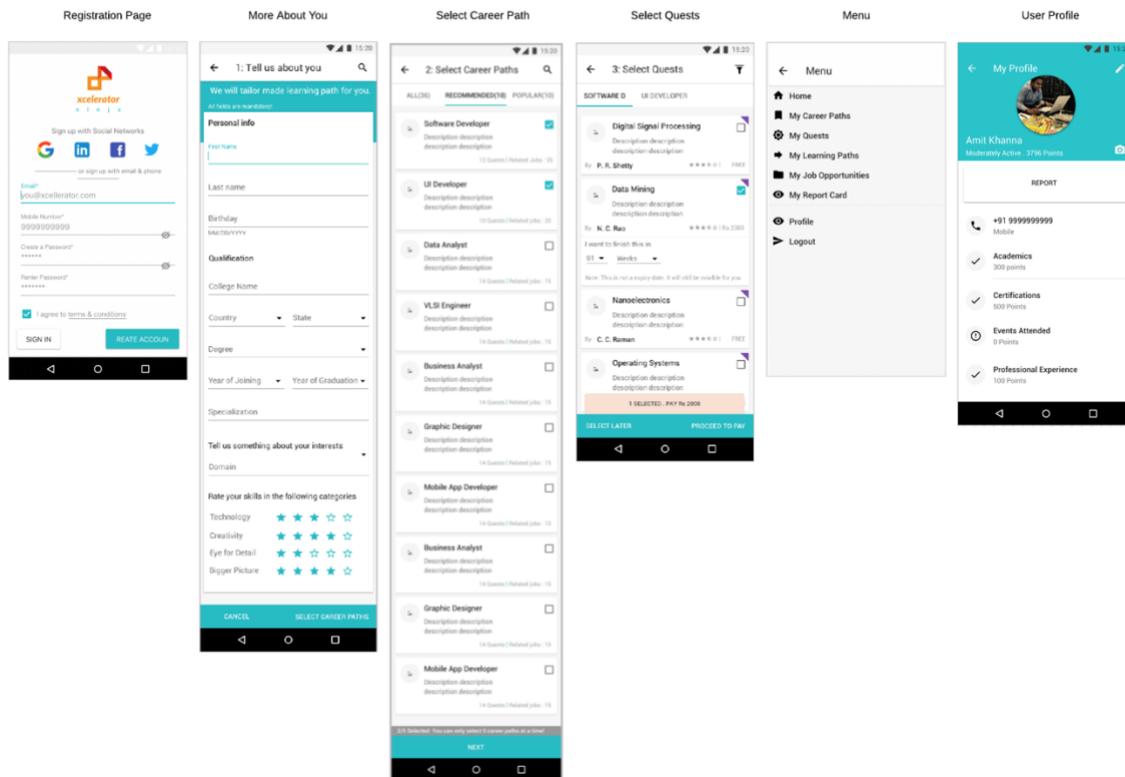
More specifically, the app should be useful to the students in helping select a career path. Students are often confused and need guidance and inspiration to zero down on a career path that is most suitable to them and in line with their abilities. Once they have selected a career path, the app should also help students stay focused on all activities pertaining to the chosen career path. Yet another impact area is, the app should help students realize their current level through periodic assessments and should also guide them on how to move to next level. On a different note, students are often influenced by mob mentality by virtue of constantly being around large groups and peers. The app should be able to use the mob mentality to push students towards a positive impact in their daily assignments and studies.

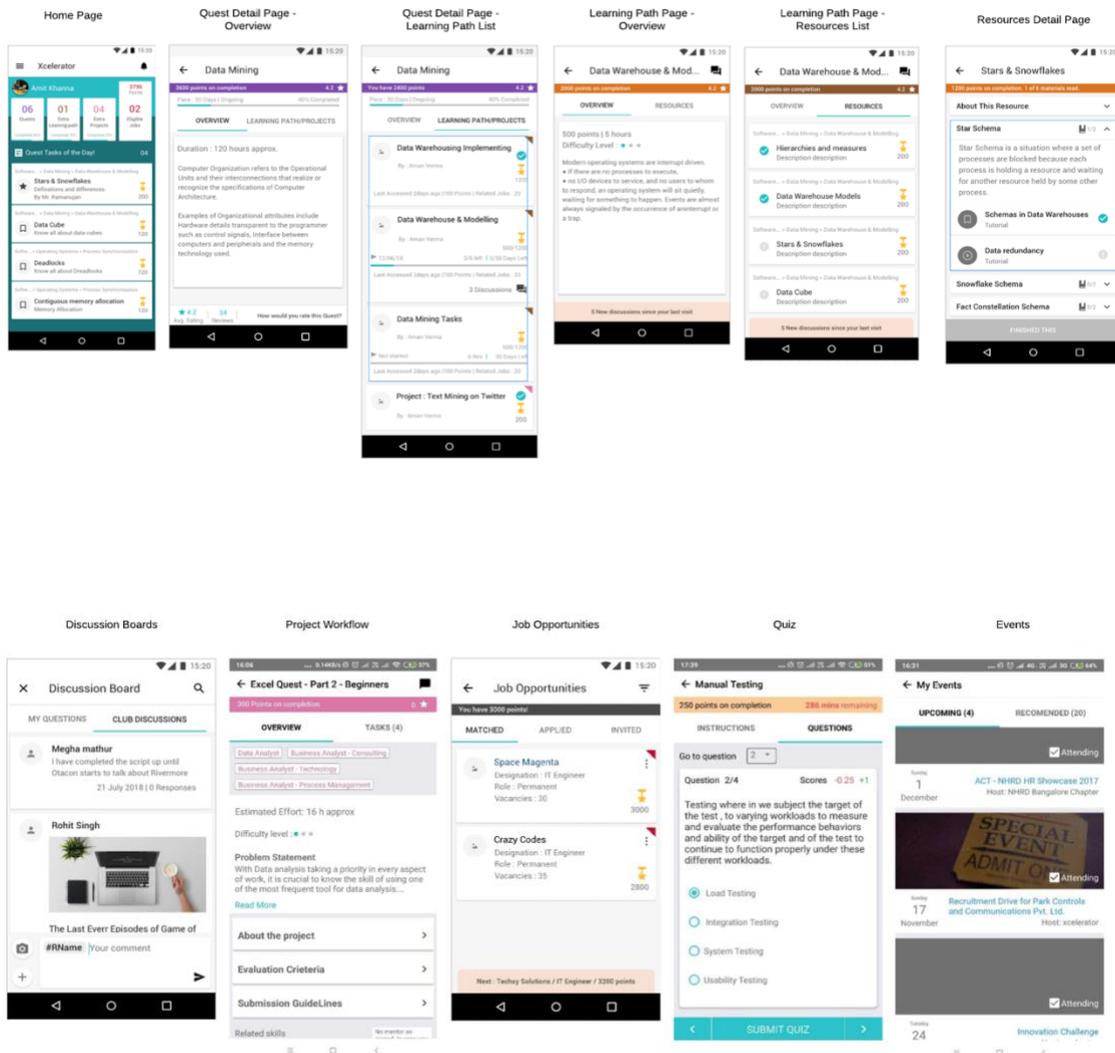
Additionally, the app should also adopt a gamification approach towards the whole curriculum in order to increase student's motivation and engagement. Game design elements and gameful experiences should be used to support learning in a variety of contexts and subject areas and to address related attitudes, activities, and behaviors, such as participatory approaches, collaboration, self-guided study, completion of assignments, making assessments easier and more effective, integration of exploratory approaches to learning, and strengthening student creativity and retention.

Furthermore, the app should enable our client to build the digital presence of their customers – colleges and universities. Faculties of colleges and universities should be able to use the app – to push contents that are useful to students, to administer periodic assessments, and to mentor students in practical assignments. This builds a bridge between the student and faculties especially when student needs them. From faculties point of view, this helps them scale and pay personal attention to a large number of students instead of a dominant few in the classroom. From the institution point of view this help create an enhanced touch point and project an image of high quality and service level. The basic pitch of our client is that institutions can start with leveraging micro moments of the student that they have control over, such as pedagogy and assessment. Eventually they would use that success to influence other moments such as career selection, job selection etc.

Solution Approach

Based on the detailed understanding of the client’s business model, specified needs, and backed by a thorough user research, the following student activities were designed and planned within the app – career paths, quests, learning paths, resources, club, discussion thread, events, quiz, project, jobs. From the student point of view these activities have deep utility which help them accomplish their tasks and goals and hook them to keep opening the app. Further, to ensure an engaging app experience, the following design points were taken into detailed consideration: first time users before entering into registration flow sees a screen detailing the utility and benefits of registration; post registration when user returns they see a dashboard as starting screen which help them stay focused on their daily course and activities; the menu of the app is in line with mental model of students; students are allowed to go back easily in one step throughout the app; student sees a filtering option in all search places to help organize the result; very few forms are used in the app and wherever used is very user friendly; wherever text entry is required appropriate keyboards are provided; at appropriate places students are allowed to provide detail rating and review of the content; progressive content loading features are used throughout the app which helps avoid blocked user interface, icon loading, and smooth rendering of features.



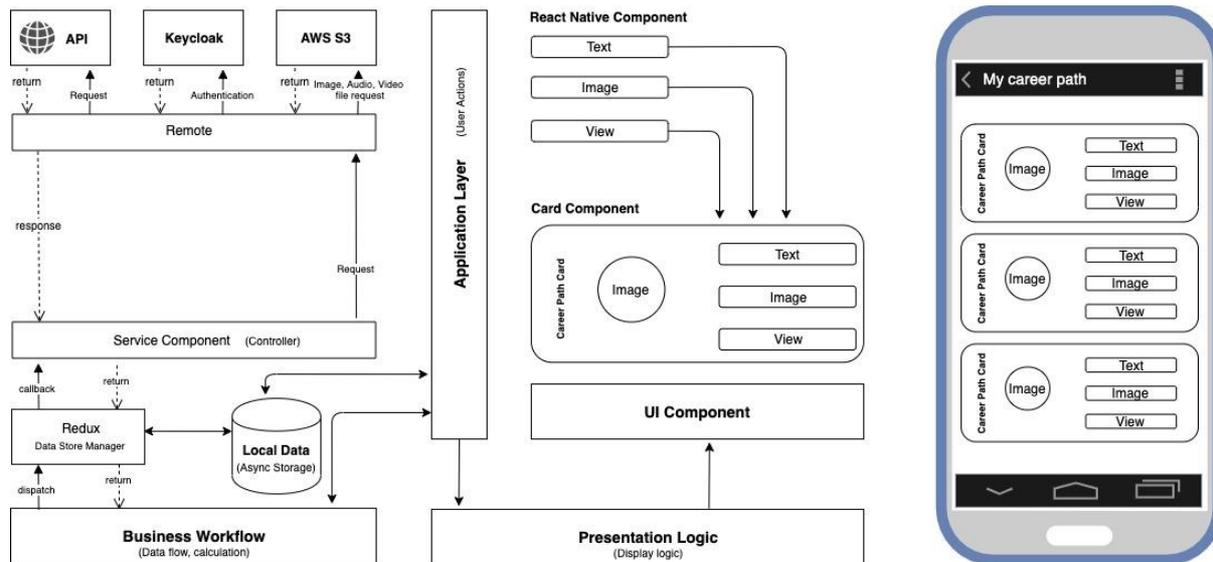


On the app, students begin their journey by filling in their personal details, based on which they are recommended a set of career paths which are best suited for them. To move forward students are required to select a few career paths from the recommended career paths which interests them. Based on career paths selected, students are further recommended a set of courses or quests areas, which will help them build their skills. Each quests or courses are mapped to a set of subjects or learning paths which is turn is mapped to set of topics or resources. Again, students are required to select few quests that best interests them. Once this is done, student is set up for their journey on the app. From then on, the app keeps pushing on a daily basis, the set of resources or topics that the student need to complete. Quizzes are also embedded as part of learning path and are pushed to students, which they need to complete to get certified on the learning path. As students keep completing the resources, quizzes and learning paths, they keep earning points as

well building the skill. Each learning path is mapped to a club which hosts multiple discussion threads. In case the student has some queries or doubts they can join an ongoing discussion thread which caters to their questions or start a new discussion thread. Based on the courses that they have enrolled and the subjects that they have completed, students are also recommended related events. Students can sign up for the events and also mark their attendance for the events, which help them earn points. Once the student has crossed a threshold level of points, they become eligible for internship projects and also jobs.

As is evident from above, students have to complete a wide gamut of activities on the app for longer duration. This makes it very difficult and arduous journey for students and they need handholding along the way. To string such diverse activities for the student gamification concepts are used along with leveraging the push notification capability of the app. Based on the activities completed by student on the app, relevant tags are dropped. These tags are used by the back end to profile and segment the student. Gamified and personalized messages are pushed through notifications to identified student segments, which guide them to the appropriate related activities, next activities or next level. The app elaborately point system to gamify the experience. The point system help provide immediate gratification for a student's activity and thus act as source of encouragement and motivation. The point system is also combined with a reward mechanics in the form of job eligibility which helps drive long-term sustainable desired behavior.

We have used reactive native framework, facebook's open source framework, for the purpose of building this mobile app. React Native allows to use same code for developing both Android and iOS Applications. It also allows to perform complex task using simple codes. The user interfaces designed in React Native are more responsive, decrease load time and provide a smoother feel. React Native has a modular architecture that helps developers to quickly upgrade and update applications as well as reuse code between web and mobile API. Due to extensive use of JavaScript, it has the ability to do live updates, which mean developers can push the code to the user's phone without having to go through the app store update cycle. Mobile apps created using React Native platform uses a combination of Javascript and React, which enables it to perform as well as any native app. Finally, it provides a better development environment through its hot reloading feature, which allows for UI refresh (post code changes) without any build and deployment.



Component Architecture of Student Engagement Mobile App

React Native has a vibrant community that made highest number of package contribution (when we started building the application). Some of these available packages improve code performance, stability and easiness. The curated packages that we used for the purpose of our app development are: Lodash, Redux and Redux-thunk. Lodash makes Javascript easier by taking the hassle out of working with arrays, numbers, objects, strings etc. Lodash modular methods are great for – iterating arrays, objects, and strings; manipulating and testing values; creating composite functions. Redux is a state management tool for javascript applications. The main concept behind Redux is that the entire state of an application is stored in one central location. Each component of the application has direct access to the state of the application and doesn't require to send props down to child components or use callback functions to send data to the parent. All this greatly reduces complexity of the application code. Redux store can only do simple synchronous updates by dispatching an action. Thunks are the recommended middleware for basic Redux side effects logic, including complex synchronous logic that needs access to the store, and simple async logic like AJAX requests.

Conclusion

The education sector is experiencing a lot of shifting trends because today's students and learners are millennials, digital natives and very comfortable with digital mode of learning. The digital mode of learning is self-paced, self-directed, flexible and more engaging. It makes student teacher communication much better, where teachers play more the role of a facilitator and coach and can pay attention to a wider range of students instead of a selected few dominating students in the classroom. Schools, colleges and universities are

increasingly recognizing these emerging trends and willing to digitally transform their mode of imparting of education in order to stay relevant. It is for this reason that our client has been able to successfully implement the solution in many Technical Universities in India. Until the time of writing this document, the App has been downloaded by roughly 3000 students and is roughly used by 600 users on a daily basis. Moreover, there is a jump of 25% in the student engagement, for our client, because of the App.

The App was developed in an Agile fashion spreading over multiple phases. Initially the app was launched with minimum viable features. Based on the feedback from real users during beta testing many features were finetuned and even new features added. A great degree of automation testing, using Appium automation tool, was employed to reduce the churn during development and also to bring quality to the heart of the development process. All of this helped in reducing the overall time-to-market for our client.