

Mobile Applications at a Mega University: Anadolu University Campus App

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Abstract

This paper explores the use of mobile applications to aid on-campus and off-campus students at a mega university. Anadolu University — with over 1,900,000 students enrolled from over 30 countries — is the world's second largest university by enrolment (List of largest universities by enrolment, 2014). From its early days, the University has used various means to access its students. During the last decade, with the introduction of mobile technologies and smartphones that are connected everywhere, the expectations of students have changed. Students now expect to be in contact with their educational institutions without any barriers. Anadolu University released its first mobile campus app on an iOS platform in May 2012. Students adopted the App quickly and the mobile app user community requested new functionalities. Since then, the University has released three major and over 25 minor releases of the app on both iOS and Android smartphones. This paper describes the lifecycle of Anadolu Campus App and its evolution over the years. It has been widely accepted by our students both on campus and off campus, and the increasing number of users gives an insight into the high rate of adoption of smartphones.

Keywords: mobile applications, technology integration, student support services, Campus Application

Introduction

Within the last ten years, three major technologies has emerged — mobile devices, social media and location-aware services — and service providers and consumers started using these new technologies, forming new habits around them. Mobile devices, which can access the Internet over cellular data networks, enabled us to have a new communication medium. Smartphones and tablets that are constantly connected to the Internet have allowed users to access information and conduct transactions without any locational barriers.

Users of this technology, especially students, started expecting their service providers to

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conform/adapt to this new medium. Universities, as educational service providers, began to create applications to support their students' learning experience. Abilene Christian University (ACU) was the first university to integrate mobile devices into its education system. The iStanford application for Stanford University was one of the earliest university campus application released on the Apple Appstore (iStanford, 2014). Anadolu University, the world's second largest university by enrolment, implemented Mobile Campus Application running on Android and iOS devices, so that students and faculty staff could access campus resources from their smartphones. The initial version of the application was released on iOS devices in early 2012. It had been installed on 48,400 iOS and 43,356 Android devices, which is a total of 91,756 mobile devices, as of October 1st 2014.

This paper describes how Anadolu Campus App evolved to what it is today. The next section gives details about Anadolu University and its student demographics, and looks at mobile applications from other institutions. Section 3 details the development process and current functionalities of the Anadolu mobile App. Finally, Section 4 provides our conclusions and indicates our future work.

Anadolu University

Anadolu University (<http://www.anadolu.edu.tr>) is a dual-mode University with 16 faculties (three of which offer open education), four applied schools, four vocational schools, nine graduate schools, 25 research centres, and 15 research, development and application units. Its open education system has been taken as a model by many countries. With an enrolment of over 1,900,000 distance students, the University is the world's second largest university. Currently, the open education system offers 11 bachelor degrees, 31 associate degrees, and 26 certificate programs in a wide variety of disciplines. It offers open education opportunity to students living abroad, mainly in the Turkish Republic of Northern Cyprus and Azerbaijan, and in various European countries. About half of all higher education students in Turkey are students of Anadolu University's open education system. Courses are delivered by a variety of methods, including the Internet, video conferences and pre-recorded television broadcasts.

The University has three campuses in Eskişehir, Turkey. The majority of administrative units and social facilities are at the main campus, YunusEmre Campus, which is located at the centre of Eskişehir. İkiEylül Campus houses the School of Physical Education and Sports, the Faculty of Aeronautics and Astronautics, the Faculty of Engineering and Anadolu University Airport. The Porsuk Vocational School offers education in its own building in the city (About Anadolu University, 2014).

Anadolu University's students have access to all cultural and arts activities at the theatre, concert and exhibition halls on the campus. They also have the opportunity to do sports in gyms, a semi-Olympic swimming pool, tennis courts and green pitches. The University also provides housing and food grants to successful, but financially disadvantaged, students.

A large survey was conducted during registration for the 2011–2012 academic year to assess the students' computer literacy levels and Internet access. The survey included 43,272 newly registered students, which was around 30% of all the registered students that year (Karadağ, 2014). The computer literacy levels of students are summarized in Table 1. According to the survey results, only 0.6% of the students had no computer skills and over 91% had skills at intermediate level or better.

Table 1 Computer literacy levels

Computer literacy Levels	New enrolments	Ratio
None	266	0.6%
Beginner	3,555	8.2%
Intermediate	23,253	53.7%
Advanced	16,198	37.4%
Total	43,272	

Table 2 Internet access types and ratios

Internet access type	New enrolments	Returning students	Total	Ratio
No Internet access	1,466	1,117	2,583	3.3%
Only from home	19,232	13,070	32,302	41.0%
Only from work	4,512	4,539	9,051	11.5%
Both from home and work	13,580	14,590	28,170	35.8%
Only from Internet cafe	4,482	2,159	6,641	8.4%
Total	43,272	35,475	78,747	

Table 2 above shows the results of the survey that analysed whether the students had Internet access, and how frequent they could have access. Only 3.3% of the students had no daily Internet access, with 88% having daily Internet access either from home or work and 8% having only access from an Internet cafe.

These results encouraged Anadolu University to integrate technology more into its educational system. After this survey, some of the projects that were started were the Creation of Interactive eBooks for distance education programmes, Online Concurrent

Exams, and Video Portals for Educational Materials and Campus Applications.

Campus Applications at Other Institutions

Most of the leading universities in the world have designed and developed their mobile campus applications for students, faculty members, staff and visitors who want on-the-go information and wish to stay connected to the campus and university through mobile devices. Stanford University was the first university to launch a campus mobile application in 2008, and the application was downloaded 11,000 times in the first month after its launch. Following this, many other universities started developing mobile campus applications, including MIT, which released an open source solution called MIT Mobile that allowed other universities to develop web-based mobile solutions (MIT Mobile Experience Laboratory, 2014). Some of the examples of campus applications are described below.

Harvard University's mobile application has a people directory, a map of the campus, a shuttle tracker, dining options, news and events, as well as the course administration and admission operations, and it also provides social networking, and library options. The App allows the users to customize the icons on the homepage so that they can only see the options they would like to (Harvard Mobile, 2014). Harvard University has also developed a mobile application to do virtual tours of the Harvard campus. This self-guided tour features stop descriptions, audio, video and images, including picture from the University archives and inside views of Harvard buildings (Visiting Harvard, 2014). Both applications are available for both iOS and Android operating systems and also as a mobile Web application accessible to any web-enabled smartphone.

The University of Michigan's mobile application offers course information, including grades, course resources and announcements. Users can send documents to print stations. The application also provides real-time bus routes, dining menus, news, a phone directory, a campus map, an events calendar, career centre information, travel registry tips and emergency contacts. The students can locate open seats at campus computer labs, search in the university library catalog and use mobile library resources. The application also offers a feature to make donations from the mobile device (University of Michigan Mobile Apps Center, 2014).

The MIT Mobile has campus news from the MIT News Office, a real-time GPS shuttle tracker with push notifications for predicted stop times, a searchable campus map, a calendar of events, exhibits, holidays and the academic calendar, a searchable phone directory of MIT, a self-guided campus tour, push notifications in case of a campus emergency, MIT libraries account management and catalog search, campus dining menus and hours, and report campus maintenance issues (MIT Mobile by MIT, 2014). The application has integration with the University's course management system.

Princeton University's mobile application has the features of news, public and student events, real-time shuttle information, a campus map, dining locations, hours and menus,

a campus directory, media-rich walking tours, course listings, library access, and sports news and schedules (Princeton Mobile by Princeton University, 2014).

Stanford University's campus application iStanford has the following features: request safe ride home, inquiry about enrolment, financial aid and transcript, display news, schedules and scores of the university's teams, create flyers to capture a moment, organize a calendar, search on courses, enrol or view grades, access Stanford's learning management system, search on phone directory, have a transcript emailed to anyone via a digitally-secure pdf. The application has also built-in emergency contact numbers and information. The ePay component gives authorized students access to the University's online student billing. Also, events and tickets options allow the users to find and keep track of Stanford activities. Users can also tour and browse the buildings on the Stanford campus. StanfordMecomponent works as a mobile ID card. Videos option let the users reach Stanford YouTube video content via the App (iStanford by Stanford University, 2014).

Yale University's mobile campus application has menu options for news, a faculty and staff directory, campus maps, an event calendar and Flickr images of Yale. The application also offers Open Yale Courses' recorded videos to learn 'on the go' (Yale iPhone app, 2014).

All the mobile applications described above are available for both iOS and Android operating systems, and Stanford University also provides a Blackberry version of the application. These universities also provide 'mobile-aware' websites that detect the used mobile device type and resize and wrap the text rather than shrinking the page layout of the desktop version. This feature has become widely adopted as most websites were designed to fit a desktop or laptop display and today, with the millions using mobile devices to access the Web, it has become crucial to optimize the Web sites for these devices (What is mobile awareness?, 2014).

Anadolu University has also implemented a 'mobile-aware' feature, available for both iOS and Android from November, 2014.

Development Process and Functionalities of Anadolu University Campus App

The first version of the Anadolu University Campus App was launched for iOS devices on May 15, 2012 and was followed by the Android version on July 10, 2012. The development of the App started in early 2011, and went through various iterations before it was submitted to the App Store. The development process required many University services to be available via Web services, which were not available at the time. We implemented the RESTful Services which allows decoupling of resources from their representation and access from different formats.

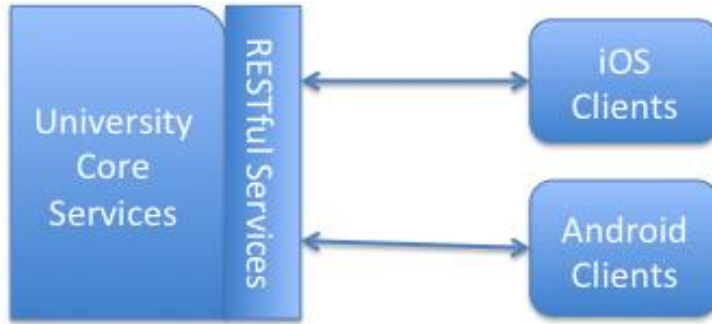


Figure 1 Communication with the campus applications

As seen in Figure 1, RESTful services (The Java EE 6 Tutorial, 2014) were implemented over all the core university functions, registrar operations, library and cafeteria operations. Any client with iOS or Android could connect to the University Core Services via this new service. This separation helped the development process as it allowed mobile developers to access critical University information without directly connecting to Core Services. University Core Services administrators and programmers used this service to control what information and functionality can be accessed by the mobile developers.



Figure 2 Version 1.2 screenshots from the iOS application

The Mobile Campus App group worked with the University administrators to come up with a list of functionalities that would be available to faculty members, staff and both on-campus and distance students. The Core Services group implemented the RESTful services for those functions, and the mobile application developers implemented the user interfaces for them. This architecture allowed Anadolu University to create Campus Applications in various platforms.

Initial functionality for the earlier versions of the Campus App was identified as Library access, registrar operations, the cafeteria, news, an events calendar and a map with the screens shown in Figure 2.

The application also supports user management and the functionality of the application changes based on the user's group. When faculty staff use the application, they can access the student list in their courses, examine transcripts or approve courses for their advisees; and when students use the application, they can check their schedule and see their grades.

iOS version 2.0 of the application was released on May 29, 2013 and the Android version 2.0 on May 31, 2013. Version 2.0 featured a new graphical design that reflected the University's corporate identity, social media integration and Anadolu University's official radio station (Radyo A) integration. Following the 2.0 version, minor revisions and bug-fixes were released within a six-month period. The iOS version of the application had seven major releases between May 29, 2013 and Nov 20, 2013 and Android version had 27 releases between May 31, 2013 and July 3, 2014.

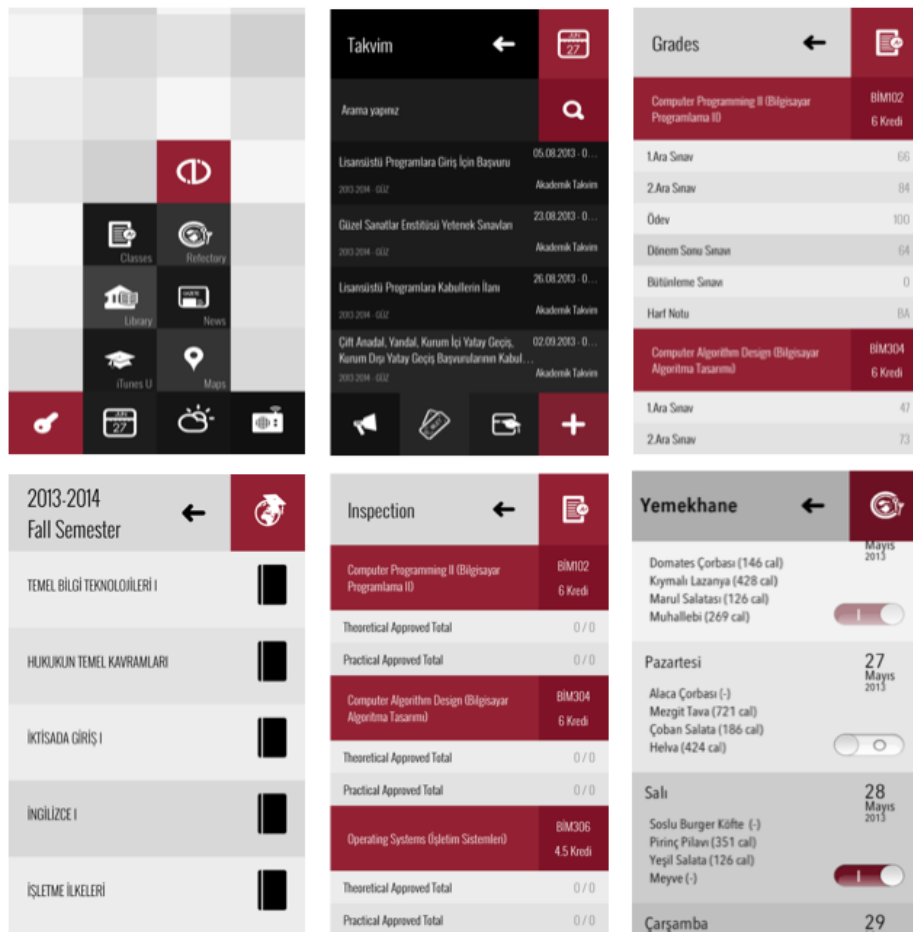


Figure 3 iOS and Android with the same look and feel, starting version 2.0

In the current iOS version of the application, students or faculty staff have access to the main menu, shown in Figure 3 top left, which offers the choice of courses, the Library, a campus map, Anadolu University Book Reader, the cafeteria menu, news, a calendar, Twitter and iTunes U. Users can also listen to the University's radio channel Radio A through the application. Some of the components, such as the courses, require the user to be logged in to the application. The authentication of the application is done via University Active Directory Servers.

Version 2 of the App had two major features. The first was the implementation of the same look and feel on all the mobile apps, that reflected the same corporate identity. The second was the inclusion of learning tools that were not present in the earlier versions. The Anadolu Book reader integrated in the App has rights management functionalities implemented and allows students to access all the print material assigned to them during their studies at the University from their phones and mobile devices. iTunesU integration allows students easy access to the courses on which they are registered from their devices.

One of the most used functionalities of the App is the cafeteria function. With over 35,000 on-campus students and over 9,000 employees, both students and employees can eat lunch at very discounted rates when they pre-purchase their meals. The App allows students and faculty members to access the daily and monthly cafeteria menu as well as the University's dining restaurants' menu. The reservation feature is also available through the application.

Conclusions and Future Work

Mobile devices that are connected to the Internet are changing how we communicate with our clients, students and employees. At Anadolu University, the mobile campus application has shown very rapid adoption by the students and staff. It is now installed on 91,756 devices of which 43,356 are Android devices and 48,400 iOS devices.

The Campus App allows distance education students be constantly connected to the campus and its resources, and the push notifications and easy access to course materials and registrar operations have made the application very popular among these students. Surveys and ratings on both Apple Appstore and Android Market show that the App is rated as 3.85 stars out of 5.

Recent versions of the App have included learning tools such as Anadolu Reader and iTunesU integration, and we plan on adding more learning tools in the future — specifically, tools to enable students to talk and connect with their peers and professors to create a more synchronous learning environment. We believe that with roughly a 10% adaptation rate within two years, our Mobile Campus App has been very successful and we will continue to develop and support new functionalities.

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