Deploying an University App Store with Open Innovation

Jaime Busquets [1], Miguel Macías[2], Raúl Mengod[3], Juan Evangelista[4] and Carlos Turro[5]

[1] ASIC-Universitat Politécnica de València, Camino de Vera 46021 Valencia, busquets@asic.upv.es.
[2] ASIC-Universitat Politécnica de València, Camino de Vera 46021 Valencia, mimaen@upvnet.upv.es.
[3] ASIC-Universitat Politécnica de València, Camino de Vera 46021 Valencia, rmengod@cc.upv.es.
[4] ASIC-Universitat Politécnica de València, Camino de Vera 46021 Valencia, jevang@upv.es.
[5] ASIC-Universitat Politécnica de València, Camino de Vera 46021 Valencia, turro@cc.upv.es.

1. Summary

The usual practice of universities when deploying corporate apps for mobile devices is to have it in the official stores of the most common systems and grow it by the addition of services like a corporate webpage. This behavior fails in the sense that don't address both the ways that mobile user consume services and also because calls for a centralized IT service managing all the web app.

The Open Innovation paradigm allows involving internal and external users in the definition and creation of services. The new Strategic Plan for 2015-2020 of the UPV states the "Open Innovation" paradigm as a strategic project for that period. The vision of that strategic project is to develop a methodology of innovative projects that can help a radical improvement of the organization.

As a first action, UPV has a pilot project in order to implement a corporate mobile ecosystem, including a corporate App Store and develop applications through a development framework that offer users agile alternatives to perform common functions.

Benefits of this project are increased service, improving the user experience, and also security and confidence that are and inherent risk in traditional stores. UPV App Store is presented to the users in mid- March 2016 containing a dozen downloadable applications.

2. INTRODUCTION

Universitat Politècnica de València (UPV) is a Spanish University with a long history in applying IT technologies to all parts of the learning process and also to University's management services. This path has led to developments like Polimedia (Turro et al. 2010), and also the flipped Classroom experience (Busquets et al, 2015) which have been presented in EUNIS and other conferences.

The new Strategic Plan for 2015-2020 of the UPV states the "Open Innovation" paradigm as a strategic project for that period. The vision of that strategic project is to develop a methodology of innovative projects that can help a radical improvement of the organization.

As a first action, UPV has a pilot project in order to implement a corporate mobile ecosystem, including a corporate app store and develop applications through a development framework that offer users agile alternatives to perform common functions. Desirable characteristics of both the portal and the resulting apps is that they are attractive, cross-platform, simple, safe, task oriented, easily configurable, scalable, evolvable and usable.

The document goes as follows: First we will review Open innovation paradigm and its implementation at UPV. Then we will show the case of Corporate Apps deployment and the Ecosystem that UPV has built around it. Finally we will show the current results of the project and the conclusions of it.

3. OPEN INNOVATION AT UPV

Open innovation (Chesbrough 2006) is a paradigm that assumes that companies can and should use external ideas as well as internal ideas, and internal and external paths to market, as the company look to advance their technology. According to some authors like Marcet (Marcet 2008), open innovation can be developed in organizations like public administrations, and by doing so they are able to provide the greatest possible value to its users, and especially in a rapidly changing world like the present.

At UPV, the initiative started with a pilot project in which outside experts, who acted as facilitators in the process, selected about thirty people from very different positions in the organization, all with the common denominator of being able to propose innovative ideas in a dynamic environment exploration.

They worked in the process in successive stages, in which ideas could be discussed, analyzed, and classified, compared with the challenges that an organization like the UPV can have in the immediate future and in a changing environment like the present. There was also opportunity of comparing ideas with companies and external organizations who have had similar experiences in the recent past.

Each round carried a selection of promising ideas, so at the end there was a manageable quantity of them. The selected ideas for further development were:

- Mobile applications (the subject of this paper)
- Virtual Office 24x7x365
- Transparent management
- Learning competences

With them we could move to the phase of product design, always following design methodologies and an associated business model.

The success of the experience, and further work on the selected ideas led to the UPV to propose this methodology to be part of its Strategic Plan for the years 2015-2020.

4. THE CASE OF CORPORATE APPS

The usual practice of universities when deploying corporate apps for mobile devices is to have it in the official stores of the most common systems (iOS, Android and Windows).This common behavior presents some problems, namely:

1. As features are being added in successive versions, the app grows in size and complexity, so browsing behavior within it gets increasingly complex, and at the end it is more difficult to find content inside the app than in the corporate website.
2. Also, as the app becomes more complex, it is more difficult to develop these new features, so the incorporation of them is often delayed.
3. There are different groups of users (teachers, students, technical, administrative, researchers, visitors, alumni, etc.) and within each group different people have different needs.
4. The development of the corporate app can only be done by the main developers group, as any update in the app can potentially harm other features.

So, a single corporate application hardly suits both the long and medium-term requirements and therefore tends to be underrated and scarcely used.

A different approach to solve these problems is to create an ecosystem of independent apps, each with a specific, easy functionality, delegating user administration of the same to user's device. In this way users can decide what apps to install and how to organize them, depending on his needs or activities. This also allows a faster development cycle, because each app is independent from the others.

A big issue with this approach is that, if those apps are published in the standard app stores, there is no easy way for a user to know what apps are available. Also, given that not all applications are intended for all user profiles, it seems reasonable to consider a profile management so that if the user does not belong to a particular group (teacher, student, etc.) the store shouldn't recommend applications which do not correspond to that profile.

Another consequence of posting apps on standard stores, is also that there is not an easy way to know if a particular app has been endorsed as safe by the university, because the policies of those stores do not require it. For example, in September 2015 a number of external apps faked as official applications of different Spanish universities. So in those stores there are applications that can fake institutional, through the use of corporate image, and be rated even higher than the official implementation of the institution.

The solution to those problems is to distribute the apps by a own store, conveniently certified, and recommend registered users the applications that can be useful to them, limiting the presence of the institution in official stores to a single corporate application that provides essential information and a link to its own store.

5. UNIVERSITY'S APP ECOSYSTEM

As stated before, several services have been selected as a result of UPV's open innovation process, being the first the apps project that we describe in this paper. The apps project aims to leverage University's development capabilities from all members (IT services, teachers, students, etc.) and doing so by creating a development structure that provides users agile services for the implementation of the most common functions.

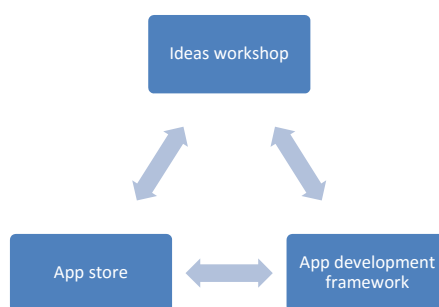This structure works around three items, as displayed in figure 1.

Figure 1. App Ecosystem

5.1. Ideas workshop

The ideas workshop encourages the University stakeholders in participating on the apps project and also to know what resources are available for the developments. It aims to create synergies between the different actors by means of:

• Envisioning Workshops, in which people think about services that could be useful to them and others.

• Challenges, in which the University challenge its members to solve particular tasks.

• Enhancement of previous work, by selecting successful use cases and enlarging their reach.

• Support in the definition of a business model.

5.2. App Store

The app store is a portal where users can browse and download digital objects, particularly apps developed for all major mobile operating systems. There users can also access and work corporate applications from a secure authenticated environment, especially when apps need access to private data.

A required capability of the apps portal is authentication. As the portal have to recognize different user profiles (teacher, student, staff, researcher, visitors, etc.), there is a need to support multiple authentication systems.
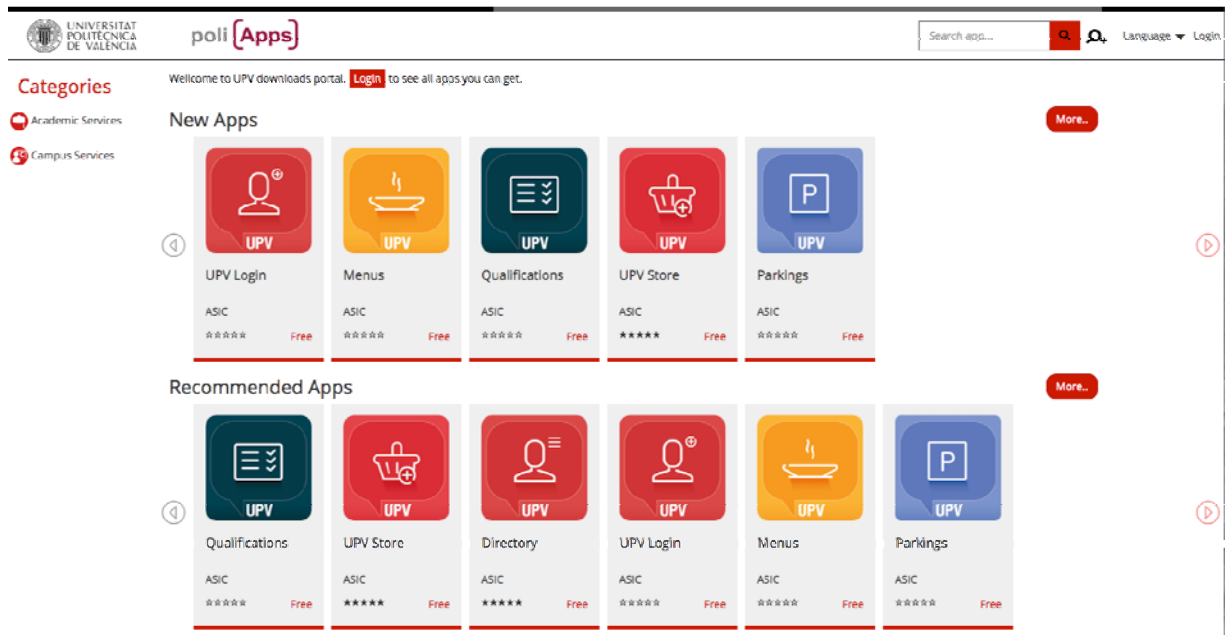
Figure 2. UPV's App Store

Currently the app portal supports:

• Corporate UPV Simple Sign On.

• Spanish Universities' Federated identity (SIR).

• External identification with users of social networks: Facebook, Twitter, Google+, LinkedIn.

• Local Users registered on the platform.

Once authenticated, the system knows the user's profile, the history of the installed applications, and the preferred language. Based on this information the system will present the applications that are available for the user, hiding those that are not typical of their profile.

The portal has the ability to merge different profiles, so if a user had registered for different systems at different times, from that moment the portal will work with in a single consolidated user information.

The store is shown as a typical mobile portal applications (see figure 3), in which the apps are presented with their icon, name, version, developer and price.

Given that the number of elements that contains the store can grow a lot, the portal support defined categories that allow you to group the apps by their different nature: At this moment they are classified in: mobility, academic services, campus, etc. Apps are displayed in four panels to view them sorted by date, recommendations, number of downloads, or see directly all that are available.

The app portal is developed in a MEAN (Mongo, Express, Angle, Node) environment and is responsive (figure 3). It is designed to be easily adaptable and customizable to other environments or organizations.

Figure 3. UPV's App Store mobile view

5.3. App development framework

Developer support is a key component in this Open innovation project. The way UPV manages this in the apps context is through the establishment of a framework for mobile application development. So this allows a common programming app and export for different mobile OSes, and also to have a library of common components to reuse code and practices between apps.

The developer support is currently implemented around the environment Appcelerator, which allows common developing and export for the two main systems: iOS and Android.

When the developments target UPV resources, which is usually the case, they need to access the business logic through corresponding REST services (see figure 4).
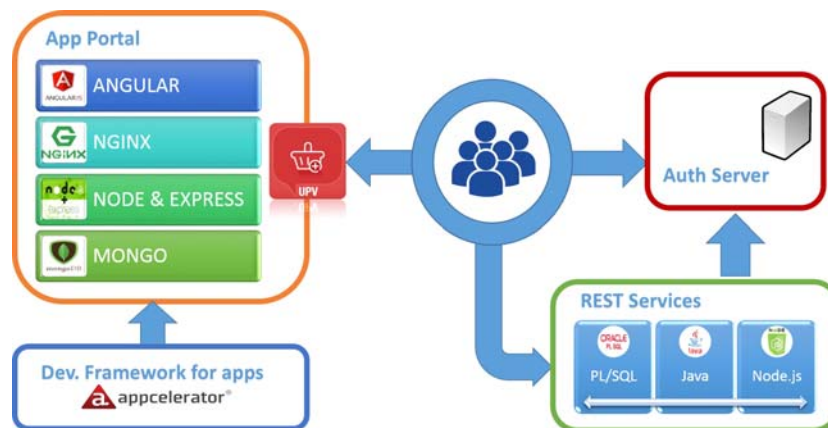

Figure 4. Development framework

6. RESULTS

The first wave of apps were focused on simplicity and expected service numbers, and also trying to improve significantly the way that users consume UPV services. Anyway, as a result of the Open Innovation process, the number of apps and the services covered may vary.

The app list is shown in the app store, and a user can get more information by clicking on it, such as the description of the features offered, some views of the different screens and a help guide. There is also social information, such as valuation by other users, the number of downloads, user recommendations and reviews. The store is presented to the university community in mid-March 2016, and includes a first collection of apps developed, consisting of:

- UPV Store
- Directory
- Live Parking information
- Daily Menus of UPV's cafeterias
- UPV Card services
- Assesment results
- Virtual Campus
- Exam results (Qualifications)

While these apps are ready for the launch of the store, they are followed by the development of another dozen emerged from the envisioning working groups.

7. CONCLUSIONS

The UPV has made in recent years an important effort in the implementation of ICT in all areas of its business, by integrating several open source or commercial solutions, or developing their own tools. As mobility is a key factor in today's society and especially in the university environment, there was a considerable gap between the solutions effectively implemented and the ability to access these services in mobility.

Throughout the past year, following an Open Innovation path, the UPV has added to its capabilities the ability to manage, support and maintain large number of mobile applications, which offer users of the university access many services in an easy and useful way while in mobility.

The store is currently being launched in March 2016, and contain a dozen different Apps and is developing another dozen of them, which will join the store in the coming months.

8. REFERENCES

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9. AUTHORS' BIOGRAPHIES

Jaime Busquets: http://es.linkedin.com/pub/jaime-busquets/

Juan Evangelista: https://www.linkedin.com/in/juanevangelistadavid

Raul Mengod: https://es.linkedin.com/in/raúl-mengod-lópez-176a9611/en

Carlos Turró: https://www.linkedin.com/pub/carlos-turr%C3%B3-ribalta