



Research Manuscript Title

COLLABORATIVE CONTENT MANAGEMENT SYSTEM FOR WEB AND MOBILE USING WEB SERVICES

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ABSTRACT

With the growing popularity of smart phones among the public as well as the enterprises, the requirement for mobile applications in various fields has started growing rapidly. Superior smart devices to the common public have tremendously increased the need for mobile applications in different environments. A huge number of mobile applications are being created by plenty of service providers in the fields like healthcare, news, retail, finance, marketing, science, entertainment etc., A common challenge faced by the mobile user is to install and maintain numerous mobile applications and maintaining them. Even the device capabilities are supporting only a limited number of applications to be installed. Having analysed and understood the architecture and functioning model of several common applications we have concluded that a common framework could be proposed where the mobile user uses a single client application and different service providers are aggregated through a common web application. For instance, selected magazines, stock market updates, horoscope reading and similar day to day information sources can be aggregated in a single platform and they can be served to the user in a single application. The service providers benefit here by not pestering the valuable user with a request to install separate application. The service providers construct their content and delivery policies as per the given regulations of the framework and the users could readily access them without the need to install one application for every single service provider. Though the model has challenges in terms of sharing the advertisement revenue, security constraints, conflicting business policies etc., we strongly feel that this would be evolved into a successful business model where all the challenges could be resolved in near future.

Keywords - Service provider, Mobile application.

I. INTRODUCTION

Recent development in technology lead to the fast growth of smart phones and has reached the people widely. The smart phones comes with various enhancements which makes people's work simpler. The popularity of smart phone based mobile application is facing a tremendous rise and the usage has increased recently across the mobile phone users. Mobile applications are basically little, self-contained programs, used to enhance existing functionality, hopefully in a simple, more user-friendly way. They are usually available in the devices of various platforms which are typically operated by the owner of the mobile operating system, such as the Apple App Store, Google Play, Windows Phone Store, and BlackBerry App World. Most of the frequently used applications are

available in the smart phones on buy. Some applications are available for free, while others must be bought.

These applications can be downloaded from the platform to a target device, such as an iPhone, BlackBerry, Android phone or Windows Phone. For example Google maps, social networking sites like Facebook, Twitter, cloud services like Dropbox and Google drive are available as smart phone applications. The smart phone applications also include various other services for banking, entertainment and education. Consider online banking. A person could sign in to the bank's web site using the phone's browser, but it will be a pain in the arse mess of text entry, resizing the display to see the little box for the PIN, having to sign in every time and more minor modern frustrations. A *banking app* simplifies the process, remembering the login information for next time, presenting the critical data in clear format and designed to make everything vastly more readable on a smaller phone display. These kinds of smart phone mobile applications allow managing the content both in web and mobile. This has the advantage of accessing the content in the web on the go. Likewise so many service providers from TV shows, websites to large scale organization offer their respective services to the world through mobile applications. Some applications make use of *web services* to offer services to the people. A Web Service provides a web API which enables two applications to communicate using XML over the web. Web Services may be developed in any language and deployed over any platform, but most importantly it may be accessed by any other application regardless of the language used to develop it. But these applications are available in a *fragmented environment*. That is each service provider develops their own client mobile application and server application as the backend to offer the services to content requester as shown in Fig 1. The service providers range from small vendors to large scale organization. So many client mobile applications are developed for every small content provider on web for similar services. This results in increased number of applications to be downloaded to the target mobile device by the client. So client may find it *difficult in managing* the installed applications. And memory usage is an added constraint.

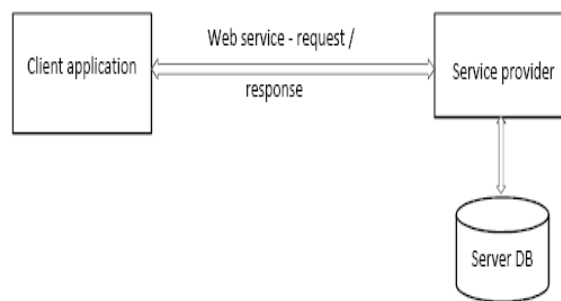


Fig.1: Single service provider application

II. RELATED WORK

Heimonen [7] carried out a 4-week diary study focusing on experienced mobile

Internet users. Mobile search and mobile browsing were the dominant form of addressing mobile information needs by this user group. The author found that search is used to satisfy broad information needs while known Web services and mobile applications were used more often for specific needs which are time constrained.

[1]Huaigu Wu proposed an architecture for efficient integration of mobile application and web services. This involved an XML compression mechanism for data exchange. The concept was proved by developing a shopping assistant which involved a mobile application that communicates with the services provided by the store. When the customer enters the store the application communicates with provider to avail the services.

The various services are listed and the chosen upon the customer request. But this is limited to application of single platform communicating with the single service provider. A dashboard application [4] called SoC-Connect for integrating social data from different social networking sites (e.g. Facebook, Twitter), was developed which allows users to create personalized social and semantic contexts for their social data. Users can integrate their friends across various social networking sites and group them in different ways. In this additional functionality was added that allows users to rate friends and or their activities as favourite, neutral or disliked. To relieve users cognitive overload, different machine learning techniques are applied to learn their preferences on activities based on their interactions with SoCConnect and to provide personalized recommendations of activities that are interesting to them.

III. PROPOSED SYSTEM

When number of applications needed to be installed for accessing various services it becomes difficult for client in managing them. In order to manage this, a generic framework is developed to avail the services from service providers of diverse environment in a single client application. That is, various content providers are registered based on the common framework on the server application. A thin client application is developed to access the

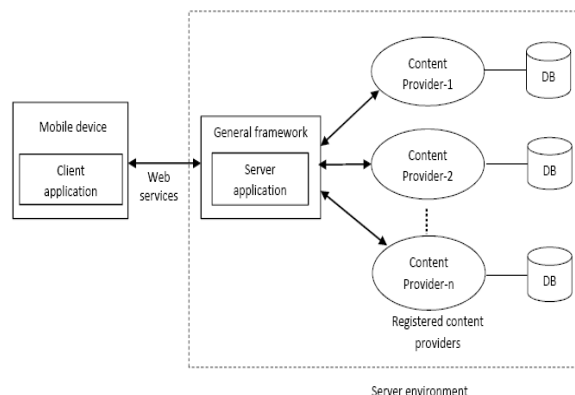


Fig.2: Single service provider

application registered service and is unaware of all the background processes performed by the application on the server environment. The client application can be installed in the target mobile device. This single client application communicates with the server application. The server application in turn accesses all the registered content providers. Based on the service request the

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services are listed in the client application. So the customer need not install more applications to access multiple web services. A *single client application* provides various services listed by the multiple content providers. Also high level of customization and management of the application is provided for the customer on the client side as the server application includes the services based on context and content.

A. Context oriented services

The context based services are provided based on the location of the client. When the data connectivity is available the application analyses the location of the mobile device. Then it contacts the content providers available on that particular location. If the registered content providers are available in the location then the services of those providers are listed on the mobile device by the client application. Consider the client application detects the mobile device to be present inside a *mall*. Next the application contacts the server application which in turn checks for the registered content providers in the mall. If *lifestyle store* and *pizza corner* in the mall have registered in the server application, then server sends the list of services offered by both the lifestyle store and pizza corner to the client application. The services may be product catalogue of lifestyle and its new offers and pizza varieties available in pizza corner. These lists of services are displayed on the client application.

B. Content aware services

The content based services provided based on the information provided by the customer. The client application checks for the data registered by the customer which is sent to server application. Based on it the service providers are accessed and services are listed. Consider some details like name, age, occupation to be collected on registration. If the age registered by the customer is greater than 60, then services related to the health care system are given preference and listed. If the registered customer is found to be a student then the services related to the education system and entertainment are preferred. Similarly more services related to the information are listed on the client application.

C. Platform independence

Mostly the application developed can be deployed only in the specific platform for which it was developed. The application developed for IOS can be installed and utilized only in the mobile devices supporting IOS and does not support other devices like Android, Windows, etc. So, many applications for the same content provider must be developed to so that it can be deployed in each platform. The proposed system is to develop the client application in a platform independent manner. So only a single client application is developed to access the server application which can be installed be the mobile devices of multiple platforms.

IV. IMPLEMENTATION

We develop the application using a framework to implement in different platforms. One such is Phonegap which allows developing the application in various platforms like android, IOS, windows. This application is developed in HTML5. The web services are developed in PHP which retrieves the information stored in the database based on the request from the service requester.

A. Mobile application

The mobile application acts as the service requester that consumes the services from vendors. But most of the applications developed can be implemented only in that specific platform. This is a disadvantage that limits the usage of application to a particular platform. The proposed

system is to develop a single application that can be made use in mobile devices of various platforms. This can be developed using HTML5

1. HTML5

HTML5 is the latest version of HTML which is very useful for building cross platform mobile applications. Most of the features of HTML5 are built with the consideration of being able to run on low-powered devices such as smartphones and tablets.

2. PhoneGap

PhoneGap allows quick building of cross-platform mobile applications using HTML5, JavaScript and CSS and is an open source framework.

B. Server application

The proposed system is to develop a generic framework for integrating multiple service vendors into a single server application. When a content provider need to establish the services, then the services should be developed based on the common format. The content provider and its list of services are stored in the server application. Since a common framework is followed, it allows multiple vendors to establish their services into the single application. The information related to services of each content provider is stored in their respective database server. The server application is provided with multiple options for the service providers to register and manage their respective services. If there is a need to add additional services then it can be done through the manage services option. Multiple providers like health care system, university and

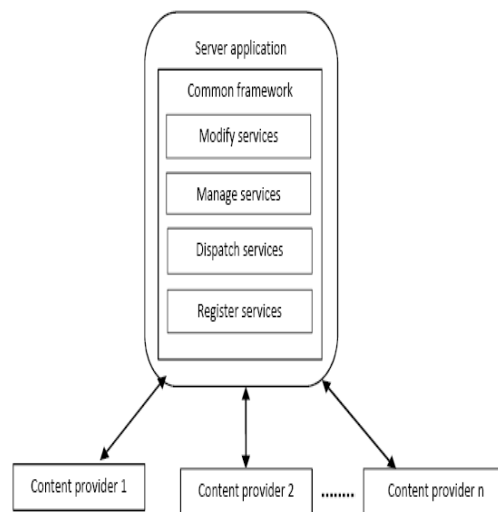


Fig.3: Server application

shopping assistant can collaborate in a single application and provide services to the service requester.

C. Client application

The service requester is the single thin client application. It is said so as it is unaware of all the processing done on the server side and only the services are listed. The proposed system is to develop a cross platform application so that it can be deployed on the mobile devices of various platforms like Android, IOS, etc. It is achieved by developing the application using Phonegap. On data connectivity the application sends the request as web services to server application. The client program bundles the request into xml message and forwards as the body of HTTP POST request.

The Web Service unpacks the request and converts it into a command that the server application can understand. The application processes the information as required and responds to service seeking application, the client application. The processing is initially done in the xml files in order to provide the content based service and context based service. Based on the analysis the required service provider is accessed. If the client application detects the mobile application to be in a mall then the list of services provided by shopping store is provided.

D. Architecture

Figure 4 shows the general architecture of client application communicating with the server application. Based on the information provided by the client application the xml file understands the user and contacts the respective service provider. The service provider accesses its corresponding database. It retrieves from the database and sends it as web

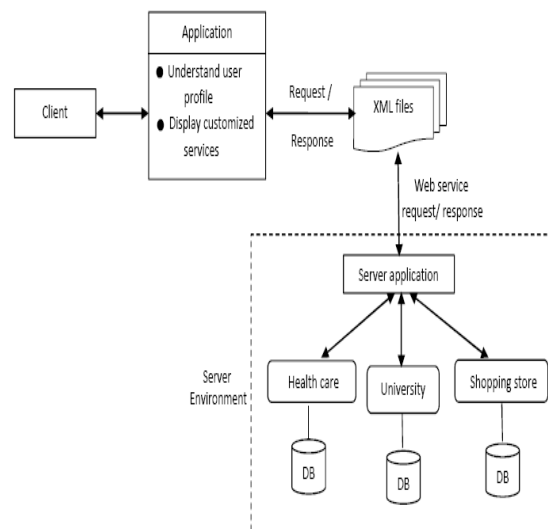


Fig.4: Architecture

services. Then the services are then converted into the format that the client application can understand and it is displayed.

V. CONCLUSION AND FUTURE SCOPE

Web services provided by multiple service providers are developed based on a generic framework. Multiple services are collaborated into a single application which can be accessed from a thin client application. Since multiple services are listed in a single cross platform client application, it is easy for the customer in managing the application. There is no need of installing many applications which results in reduced memory usage. Also the platform independence of the client application eliminates the need of developing separate application for different platforms. The work can be extended by implementing an intelligent decision making engine which crawls through several services and helps the user to get required information with a single mobile application. Also the security factors will be considered. Since multiple service providers collaborate in a single application, the details specified by the customer to one service provider must be hidden to another service provider.

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