Journal of Academia and Industrial Research (JAIR)
Volume 2, Issue 12 May 2014

ISSN: 2278-5213

RESEARCH ARTICLE

E-Business using Location Based Services in Android

D.C. Mehetre, Vivek Jadhav*, Yogeshwari Kapare, Rupali Jadhav and Sonali Zaware
Dept. of Computer Engineering, K.J. College of Engineering and Management Research, K.J. Educational Institute, 408/10, Purandar Complex, Mukundnagar, Pune-411037, India
vivek.jadhav@kjsedu.com*; +91 9730779783

Abstract

Location Based Services are increasing as per the new market trend and advances in the upcoming technologies in the field of software, hardware and mobile computing. Android has created a new competitive world in the field and hence location based E-commerce services on android technology will be further helpful for the people. In this study, the focus is on the “Location Based Services” for “E-commerce” where “M-commerce” for the same will be included. This study represents how various technologies, framework and math help to retrieve the location on maps and provide E-commerce services including the prices which are on the go. Here, we present the information with the help of an android application which fetches the data of locations from the server and displays data on console where the user views a map as well as allows users to interact with the same by using electronic communication integrated in the application itself such as E-mail services and Short Message Service (SMS).

Keywords: Location based services, android, E-commerce, electronic communication, short message service.

Introduction

Location based systems make use of geocoding which shows map’s to the users to navigate through them. Geocoding is done by a technology known as GPS which shows location and time of the device using it (Wan and Jiaotong, 2008). In addition to this, we can make use of the GPS by showing our own services and activities on the map. GPS is a technology which allows users to display and view the map by using satellite positioning (Wang and Luo, 2010). The maximum services use the standard Google maps and create overlays over the maps to provide their own services on it. Satellite tracks the location of the GPS devices and pushes services on the device (David, 1999). The technology first bought in use on PDA’s by Apple on their iPhone and now on android by providing Google API’s as open source to the users. Mobile hardware manufactures providing in built GPS service on their device help the users to take advantage of various location based services and at the same time help various companies to provide profit and non-profit services to the users via their devices. E-commerce is a process of buying and selling services over the internet or by any electronic means that help in communication such as computer networks. IP (Internet Protocol) plays important role in this cycle (Ngai and Gunasekaran, 2005). In a transaction life cycle using the World Wide Web (www) at least once makes it E-commerce. E-commerce is a major part of E-business and as per the details considering the market; in fact E-commerce can be said as new name to E-business. E-commerce has a continuous rise on profit chart in upcoming industry and integrating it with the android device gives it a whole new meaning in today’s rapid developing world (Liang and Wei, 2004). Since, android is the most fast growing technology, the users of the devices can take full advantage and make the world of B2B (Business to Business) and B2C (Business to Customer) never ending. EDI (Electronic Data Interchange) services help many companies to grow their customers and hence grow the business. Location based E-commerce service provides E-commerce through maps by using our proposed tool and creates a benchmark. Therefore, the main objectives of the system are to take the user queries as input, fetch requested data on console as fast as possible and display the map according to user query, display zone based colour pricing to distinguish the price range of selected area by the user and then allow user to check the details of the property he selects. There are some systems already available in market on googles android market or play store which are serving the same purpose but have some drawbacks which are explained as we move ahead. These technologies and existing working systems are mentioned in this study to inform users of similar systems that why we are building a new system if these systems are existing. The services in term use M-commerce for profit and make use of mobile services especially Android mobile services which are open source and free (McNeff, 2002, Feng and Technol, 2002). According to our generated survey report no system has similar facilities as our proposed system idea. All these systems show the pricing details in a list and also show the static or dynamic maps for the property the user is interested in. These existing systems mentioned below are websites and android applications for E-commerce for buying, advertising and selling

private properties. They also have contacts with the agents and brokers who deal with properties (Drawil, 2013). 99Acers website and android application is the most favourate website for users and they have recently launched an android application under the name of Info Edge India Limited which was founded on December 2013 and this application came to android market (Google Play Store) on Aug 2013. Application is a simple conversion of website to an android.apk application. This is a very clever application made by the company to attract the users. Looking at their demand of the users coming to the website they have made this application to make the users more conveniently use it on their fingertips of android mobile but, they have same traditional approach for the application which is for website. List of all the properties with the choice selection such as type of property, area, budget from lowest to highest and then type of property users are interested is shown. When the users click on the property they are interested in users get the entire information such as property details and the owner of the property or the agent who is willing to deal the selling and buying of property. This application and website show google maps for the users which are static or dynamic. At a time they give only information of only the place the user is interested in instead of all the areas. Why is the need of dynamic maps required for such a display? Just a static image of google maps is sufficient for the users. Wastage of bandwidth takes place for the users as well as the servers are overloaded. Drawbacks of 99Acers website and application are as follows:

- No zone based colour pricing, the website and application has the same traditional google maps with a pin dropped on the location.
- Single location information display on dynamic or a static map.
- This do not give a clear idea to the users about what amount of area will be covered, it just gives the idea where the location is on map.
- The information provided is with images of how the buildings and the location which the users are interested to buy in is, which is most of the time not authenticated or real. Modified images can also be put for advertisement.
- Complicated to use as the website is with huge amount of advertisements which makes the website to look more complex.
- 99Acers is built of the users to perform E-Commerce but the website is more concentrated on their own business marketing instead of total user satisfaction and simplicity.

Magic bricks (www.magicbricks.com) are the leading website which gives the information of properties, flats, lands for sale, plots, contact details of agents in the area for providing them the service, communication details of owners etc. Magic Bricks has also developed an android application which is almost similar to 99acers application with some contents integrated to their own magicbricks.com website. This application is launched on Jan 8, 2014 under the name of Times Business Solutions Limited. The application is recently launched so the users and customers expect a lot from the application but it is the same as the website. Magic bricks are famous for providing the information on real estate and the customers seem to be satisfied by the amount of likes and hits on the website, yet the users are unsatisfied as the information they provide is more of letters and less of images. Magic Bricks provide static and dynamic maps just for a single property view on the console which is not necessary. Drawbacks of www.magicbricks.com and application are as follows:

- Information is in the form of small images and paragraphs explaining the property details and property rates in “sq. ft.” metric.
- They provide the facility to call the agents or the owners by providing the contact details on the website directly and no call back facility or a facility to notify the owners that some users have shown interest in their property.
- Maps do not provide any comparative information on the console of map view itself; this makes it difficult for the users to compare with other properties in same area. Maps are provided by their customers who want to advertise their property for sale on magic bricks website.
- User cannot distinguish and compare between two locations in the same area as well as different areas. Users have to view the comparative information on different pages.

India properties website and application is made for real estate based property management, lease management, sale management (www.indiaproperties.com). Although, a person can buy and sell the properties across India by using the website, he can also advertise his properties which can be given on lease. This website is simple and easy to use as they provide a radio button format for selection of what the user wishes to do on website. Website only made to manage properties in India and not in other parts of the world. They have an android application launched on Aug 27, 2013 which is named under Matrimony.com Pvt. Ltd. Drawbacks of www.indiaproperties.com and applications are as follows:

- A combination of map with comparative pricing and details of properties and images would have done better on the same website and application.
- The website is just for real estate and not for all purpose E-commerce.
- Website comes with huge amount of unwanted advertisements and offers which are unnecessary and irritating.
- Users want simplicity and this website is so complex to use that users give low rating just for the websites bad user interface.
- To go commercial and make some money from the website they have integrated so many advertisements that they have less focus on the main purpose of website and more focus on advertisements.

Makan.com (www.makaan.com) is a website similar to the www.indiaproperties.com but it provides some additional facilities such as comparing price trends for a particular city which is helpful for the users to compare according to the cities. The website also gives a separate priority to commercial properties as it has a separate tab only for the users who wish in commercial properties. The major setback of the website is that it provides a huge amount of annoying pop-up's and unnecessary advertisements. They do not have any android application for their users. Drawbacks of www.makaan.com are as below:

- Huge amount of repeated advertisements and pop-up's that come in between the console while reading any property information.
- If we wish to click and show interest in buying and selling any website it gives us a registration form to fill up which will give us ample of offers on our email id or on phone via SMS.
- Last but not the least, they lack the use of maps and any location based services, Images are provided but in less clear fashion.
- Website only deals with real estate and does not have any application software for the users to use on their personal devices and they do not have any android application.

Real estate by smarter agent android application is an android application is based on comparing, buying and renting closest properties in selected area. It is a small application but with a major use and functionality. The major drawback is that they don't have updated information. The users can see the properties which are closest to buy or the properties which are already being sold and their rates. This application is on the Google Play Store from Dec 17, 2012 under the name of Smarter Agent and it is a Business related E-commerce type of application. They don't have colour based zone pricing which is there in our proposed system. In this study, our proposed system uses the same technology and helps the users to track nearby area prices on their device. We consider the proposed system as the one shop stop quick service for the users to save time money and energy. The system gives nearby property prices on maps and not on the website unlike others. Proposed system is made in intention to migrate all the websites data on our maps.

Materials and methods

Proposed system: System performs E-commerce on android based device using google maps. We will create our own overlay structure on the map and keep the maps dynamic at the background but keeping a static overlay on the foreground. The traditional google maps which are available freely for creating our own overlays on it will be used and then we will colour the maps according to the pricing information about the lands. The colouring will be zone based which means we will colour according to the approximate pricing of the locations such as giving red colour for the area which has higher price coming down words to the areas having fewer prices in green colour. The difference can be clearly seen in Fig. 1 and 2.

Fig. 1. Proposed system Imaginary view: Proposed system view will look like this in a zone based colour and pricing fashion.

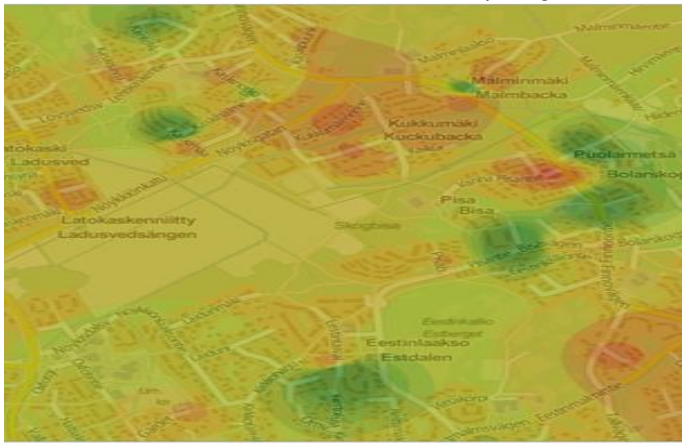
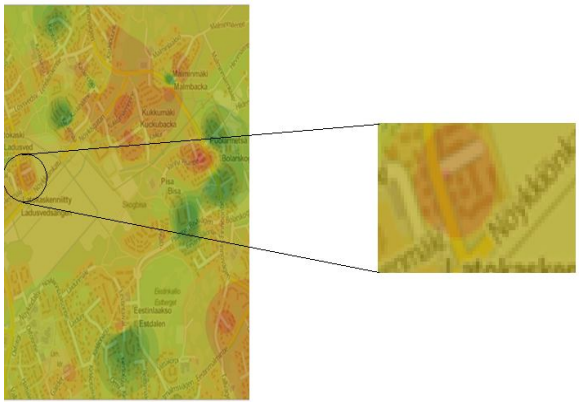


Fig. 2. Red colour for highest pricing in a particular area will be shown like this.



On the similar type of figure, the maps are seen and then on that when the user zooms in he/she will get the entire comparative pricing information about the other areas in the city and the prices on the maps. Thus, we are giving the clarity of information direct on maps without the related data hidden from the user. We are performing such a complex task yet the user interface is simple as most of the successful people believe in simplicity in making things and simplicity in using the same. Our proposed system will contain simple UI for the users to enter the city or area they are interested in and the price range they are willing to buy the property. After submitting such simple information without any extra user information, the users will be taken to the maps where they will view the selected area and the comparative prices and rates on the maps. User can select the property they are interested in and they will get the entire information about the property and the contact details of the owner. Users can directly contact the owners and perform the further activity with the users. The information will be retrieved from the database where the users and the owners have inserted the information about the property they are willing to sell, the

administrators of the application will analyze the information and colour the area according to the zone on the front end based on the price range of property seller. The users have to register using our application or using our systems official website where they can insert the information in a form with a simple UI. This information will be analyzed by the administrators. The Google maps API provided officially by google helps to implement various types of framework. Here, we are using especially the Google Maps Android API (Pejic, 2009).

Proposed system has a traditional N-Tier framework and it uses mixture of intelligent information retrieval algorithms. Existing system shows everything on maps rather than moving through web page tabs and menus. User using the application can see every detail on map including the contact details of owners of properties. For more in detail view, the users can leave the map and go on to all details page for getting all the details of the property dealer. Competition in market is always good for engineers to take advantage of the technologies and make something interesting and newer than the other similar competitors have already made. As mentioned above, the existing E-commerce applications lack some of the major facilities which are required by the users. Therefore, in addition to these applications and websites we are creating additional functionalities to these existing applications and create a very different application which will have some of the similar facilities which the users already like and on the other hand what the users don't like is overcoming in our proposed system. India has most talented engineers and great platforms to use their ideas and help the world to get something new from the technology. Using this paper publishing website as our platform we would like to introduce a new idea for "Location Based E-commerce Pricing Tool". As mentioned above we are not competing any real estate application or website, because our vision for creating "Location Based E-commerce Application" is different than the aim they had by creating these applications, we are launching a very new system which is performing E-commerce on maps with clarity of information which will not keep the users in dark about the pricing rates in areas they want to buy properties in. Google is a huge corporation which provides us the service of using maps through their satellite launched. Furthermore, Google contributes to make the maps available for the users as freeware to use in our own applications and provide our own services on maps. Proposed system also makes use of google maps. Existing systems as shown in Fig. 3 show the google maps with a simple view without overlay.

Comparative study: Now from this**,** we can easily compare that which area we want our land to be in, which area we should buy our property and in which area we can buy it. Here, map says everything no need of fancy menus and different tabs for comparing the prices, it is simple User Interface i.e. Map which says it all.

An overlay structure can now be created for the maps to see the location, as we zoom in**,** we get more and more clear information about the land as it is marked in zone based pricing bands. Maps will show the information accordingly: Red colour for highest prices in the city coming towards lower prices using dark green colour. We can now add over the pins and the activity information such as sending an e-mail to the owner of the place, giving a missed call to the owner or to send him the message. We will also add up a "Show Interest" button for the owners or agents to know that the customers are interested in their property to buy it. So that the owner knows and he calls back the user who showed interest. This interesting functionality is lacking in existing systems. Our system will allow the users to navigate through the locations according to the need of their budget, so we allow the users to enter what is their budget so that we could show similar information on the application. Zone based pricing will be done according to the areas in the city as we can take example of Pune city. According to the references, there are a total number of 306 plus areas inside Pune city and adding more as the city is second most known metropolis in Maharashtra for its suitable climatic conditions. Comparing the prices in 306 plus locations just in Pune city will take many days and even weeks for the users to compare and know what is best for them. The proposed application serves their purpose by colouring the locations as in maps itself will solve their problem, thanks to google for making this best facility available to us. To carry E-commerce using proposed android application tool will take a new step in the era of E-commerce using location based services on android and similar platforms. Instead of using all the existing systems for purchasing properties and comparing those using different websites, all the user needs are matched here in our proposed application.

Android operating system: Android is an operating system developed by Android Inc. designed primarily for touch screen smart phones and tablet computers (Qingquan, 2010**;** Wang**,** 2011). Android is an open source technology and Google uses the Apache license for releasing the source code. Smart phones have great interfaces and design for user satisfaction and functionality we can make use of this advantage and implement the existing system on such well-designed android smart phone (Zhou, 2010**;** Dunlu and Lidong, 2011). The source code is open source which provides opportunity for the software to be willingly and readily available. It is free to be distributed and modified by device manufactures, interested developers with its permissive legal licensing. Android is based on Linux Kernel and Google backend financially bought it in 2005. In 2007**,** the Open Handset Alliance was founded as a consortium of providing hardware, software and telecommunication companies loyal to beginning open standards for mobile devices.

HTC Dream is the first android smart phone released on Oct 22, 2008. Android has the large community of developers which write applications for the android based devices which extend the functionality of the device. The applications are primarily written in Java Programming language. Google Play has 1,000,000 Applications in July 2013 which had approximation of 50 billion downloads and in addition to these total number applications we are adding our own application which is an "Location Based E-commerce Pricing Tool on Android Services".

Latitude and longitude used in proposed system
Equator: Equator is a zero degree line on the world map which divides the map from the exact middle at zero degrees from north and zero degrees from east direction. Then with a distance of +10 degrees and -10 degrees, the scale for latitude and longitude begins. Equator is important to identify the exact distance of a point where latitude and longitude meet each other.

Latitude: Latitude is known as a geographic coordinate. It specifies the north south position of a point on the map. These lines run from North Pole to the South Pole. These are the vertical lines on the world map which cut the globe into various parts which can be identified by geographical coordinates.

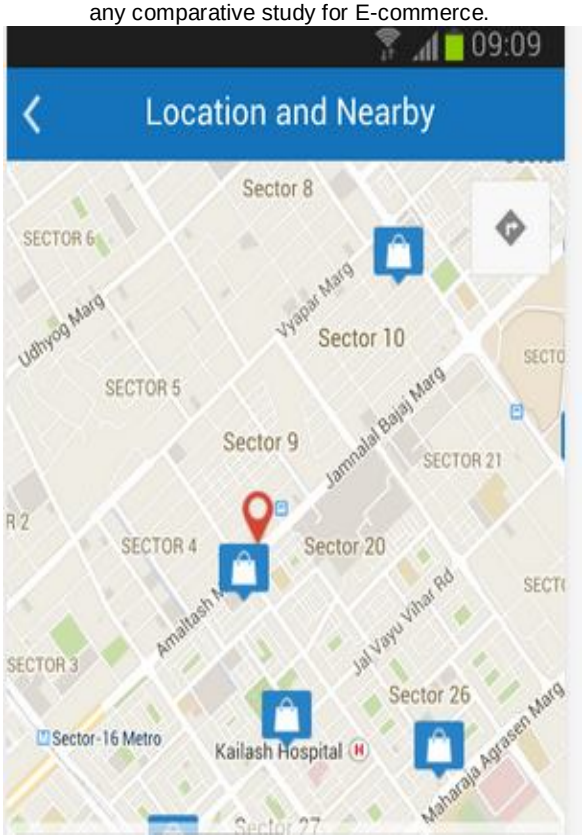
Longitude: Longitude is also a geographic coordinate like latitude only it cuts the globe horizontally from East to West and meets each other again. This line runs in parallel to the equator.

Help of longitude and latitude in maps: Longitude and Latitude together help us to identify any location in the world by the geographical coordinates which are the exact points where the longitude and latitude cross each other.

Results and discussion

Proposed system makes use of the definitive services used in typical n-tier architecture. Here "n" is 3 so this can be said as 3 tier architecture and tiers can be increased according to the requirements and needs of the system. The three tiers are Presentation tier, Business tier and the Data tier. The Presentation tier here is the software which is displayed on the user's console. The Business tier is the service which is used to get the data and show the data as shown in Fig. 3. Here all the business logic and translation of user queries into database understandable form is done. The third tier is the Data tier; takes the responsibility of taking translated queries from the business tier and execute them to get the data from the database. Thus, the data from the database is fetched and then passed back to the business tier. The business tier checks the data against the rules of the system and the query provided by the user and displays data back to the console on the presentation tier.

Fig. 3. Screenshot of one of the existing system showing the information in simplemaps and pin drops without any comparative study for E-commerce.

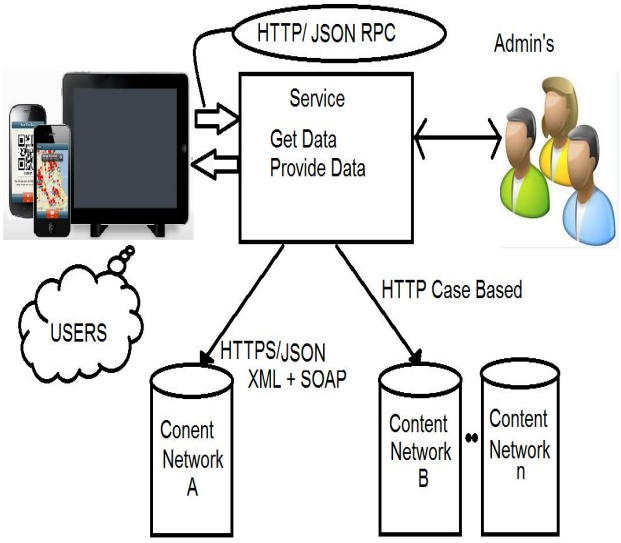


Framework supports multiple users as fast as possible and serves the users instantly depending on the internet speed of the users console. The basic idea of how the model should work is given in Fig. 4, where we have the following entities playing different roles which are explained after the figure. Here, an internal part of how the system works is shown as:

1. Users
2. Service
3. Administrator
4. Content networks.

Users: Standard users of the mobile devices, here the mobile devices term is used with respect to all the android based smart phones, tablets and other android devices. Users using the android devices have the Location based E-commerce pricing tool application installed with them and the application itself has all the facilities provided to get the data on console which is provided by the service. The map will be displayed on console which displays activity and information about location available for E-commerce and the communication details with the liable persons. No false information will be provided which will be made sure by the administrators. With the HTTP and XML/JSON remote procedure, calls the users communicate with the Service where an intelligent data retrieval algorithm is running to sort the data and provide to users as per their needs, XML/SOAP for data carrying and security.

Fig. 4. Framework of proposed system.



Service: Services are the business logic to take the date from the user and then apply all business logic against the user's queries and then pass over data to the database. Similarly, take the data from database apply the business logic and pass over data to the user's device (console). This is similar to three tier architecture's middle tier and here in our application, we are doing nothing but maintaining a three tier architecture which certainly can take place of a N-Tier architecture as the number of content network, we further add to our proposed system in this study.

Administrator: Administrator is the company personal or any authority who has the legal rights to manipulate the service and the database. These authorities provide with the new updated information for the users to be updated with the latest information regarding the E-commerce in particular locations. In LBS, administrators play an important role for updating the data and constantly improving the services provided to the users.

Content networks: Content network is basically with reference to our framework is a server which contains databases, cloud, related storage mechanisms which provide efficient storage to the users. Content network is a whole data stored as the backend services. Data will be retrieved and carried using standard protocols which carry data such as XML/SOAP and SOAP.

Conclusion

Thus, from the overview of our study, we can implement an efficient solution for the E-commerce industry by setting a benchmark in the field of technology related to android and M-commerce. Location based services are in use by our proposed system in most efficient manner. We have found a middle path for the customers and users (B2B and B2C) of the E-commerce property related applications.

Thus, we have studied that our proposed system is efficient and feasible for working over android mobiles so that the users can take the application's advantage and use the location based services over android mobiles to judge the proper pricing and knowledge of areas they are interested to buy or to have knowledge of areas and properties. Using a simple architecture for any application will work faster and will be user friendly for the users. In this study, we have seen the existing systems and their drawbacks which we have overcome in our proposed system.

Acknowledgements

Authors acknowledge Mr. Deepak C. Mehetre, Asst. Prof., Computer Engg. Dept., KJ College of Engg., Pune for his support and guidance for the study.

References

1. David, G. 1999. Opportunities for E-commerce in networking. *IEEE Commun. Magz*. 37(9): 95-98.
2. Drawil, N.M. 2013. GPS localization accuracy classification: A context-based approach. *Int. Transport. Syst. IEEE Trans.* 14(1): 262-273.
3. Dunlu, P. and Lidong, C. 2011. Using JSON for data exchanging in web service applications. *Wenjie XU J. Comp. Inform. Syst.* 7(16): 5883-5890.
4. Feng, S. and Technol, N. 2002. Assisted GPS and its impact on navigation in intelligent transportation systems. Intelligent transportation systems. Proc. of the IEEE 5th Int. Conf. 7(4): 483-493.
5. Liang, T. and Wei, C. 2004. Introduction to the special issue mobile commerce applications. *Int. J. Elec. Commerce.* 8(3): 7.
6. McNeff, J. 2002. The global positioning system. *IEEE Trans. Microwave Theory Techn.* 50(3): 645-652.
7. Ngai, A. and Gunasekaran, A. 2005. A review for mobile commerce research and applications. Presented at Science Direct Decision Support Systems. 43: 3-15.
8. Pejic, A. 2009. An expert system for tourists using Google Maps API. Presented atIntelligent Systems and Informatics, 2009. 7th Int. Symp. pp.317-322.
9. Qingquan, T. 2010. Implementation on Google Maps-style WebGIS based on ArcGIS. Presented atAdvanced Computer Control (ICACC), 2010 2nd Int. Conf. p.5.
10. Wan, X. and Jiaotong, B. 2008. Research on E-commerce application architecture based on the integration of workflow and agile service. Presented at Electronic Commerce and Security, 2008 International Symposium.
11. Wang, G. 2011. Improving data transmission in web applications via the translation between XML and JSON. Communications and Mobile Computing (CMC), 2011 3rd Int. Conf. p.24.
12. Wang, X. and Luo, X. 2010. An architectural design for E-commerce service composition. Presented at Service Sciences (ICSS), 2010 Int. Conf. pp.87-96.
13. Zhou, P. 2010. XML/SOAP BACnet and internet integration technology. Int. Computing and Integrated Syst. (ICISS), 2010 Int. Conf. on Res. p.45.