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Mobile Social Network Based on SOA and Cloud Computing

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Abstract: Mobile social network has started to influence people's life and work way in recent years. But how to build the ever-change applications in social networks has always been the most concern question for the academic and industry. Through the analysis of Service Oriented Architecture (SOA) and social network in deeply, it developed a set of professional service components of social network and put forward an application framework of mobile social network based on SOA and cloud computing. It has explored a new approach to the research and application of social network.

Key words: Social network, SOA, component, cloud computing

INTRODUCTION

In recent years, mobile Internet has become one of the fastest growing in the world, the most attractive prospects of the industry. It has been sprung up a large number of outstanding mobile Internet companies. They provided a variety of mobile terminal equipment and provide a rich and colorful application (Wang and Song, 2012). However, the development of the information technology of the socialization of effect also increases with the social, economic and the complexity of the production causes many new problems (Centola, 2010). Information science, social science and scientific management of the traditional method has already could not cope with the highly complex and dynamic changes of the network society brings in the modeling, analysis, management and control of challenges. As modern IT methodology and new information technologies, SOA, cloud computing and Internet of Things (IOT) provided possibility and new idea to realize mobile social applications and other distributed applications. This study analyzed the characteristic of SOA and social network in deeply and then introduced a new approach to build mobile social services and its applications with SOA and relevant technologies.

RESEARCH ON SOA AND COMPONENT TECHNOLOGY

Development process of SOA: SOA is an attention technology and is hot and getting hotter. It is an important and effective approach to realize large system, especial distributed applications.

The development processes are divided into three phases: At first SOA focuses on the integration in enterprise and resolves the One to One relations. It started from 2003 year.

Secondly SOA focuses on the value chains between the credible associate enterprises and resolves the One to Many relations. It began from 2007 year.

Thirdly SOA Focus on finding new associate and new services. It resolves the Many to Many relations. However, the start year could not be confirmed. It depends on the advanced research and application about SOA and other new technologies.

In SOA, services are wrapped as loosely coupled reusable Web services. However, at implementation time, there is no way to loosely couple a service or any other interaction between systems. The systems must have some common understanding to conduct an interaction. Instead, to achieve the benefits of loose coupling, consideration should be given to how to couple or decouple various aspects of service interactions, such as the platform and language in which services are implemented, the communication protocols used to invoke services and the data formats used to exchange input and output data between service consumers and providers. Enterprise Service Bus (ESB) can carry the services out between requesters and providers. The various services are accomplished by components.

Standards about SOA: One of the classification methods about SOA standards is the one according with the functions in SOA. They can be divided as three classes, namely the service information alternation standards, the foundation communications standards and
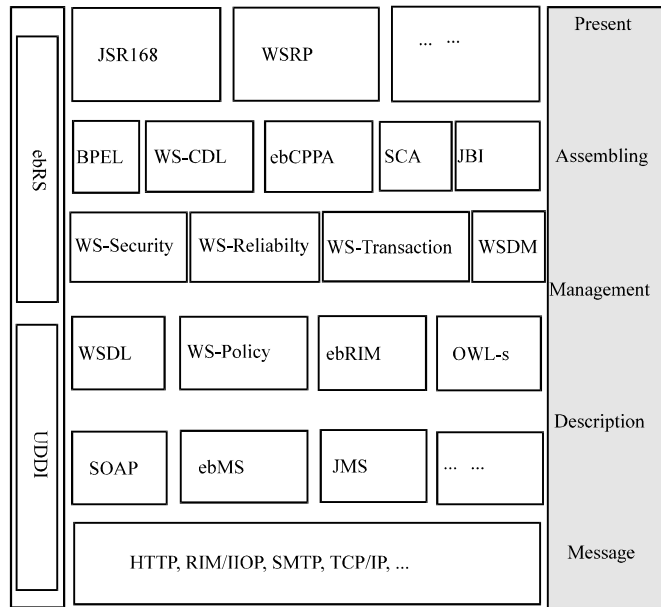
Fig. 1: Relevant standards of SOA

meta-data standards (Li, 2010). The relevant standards of SOA can be divided into six levels by the standard functions in SOA. They were showed in Fig. 1. From the bottom to top, they include transport layer, message layer, description layer, management layer, assembling layer, present and service finding register layer. The most of them have been used in the SOA applications except of ebXML and other e-business standards.

Program method of SOA: The component oriented technique is an effective and feasible method to actualize SOA. This is also the demand of the roadmap of SOA in China (IDC, 2007). The components are assembling and binding according to the business process. Of course, they should stand by the SCA (Service component Architecture)/SDO (Service Data Object) standards (Barack *et al.*, 2007; Adams *et al.*, 2006) so that to be reused in the ever-changed environments. The method of component oriented programming was showed in Fig. 2. It can be flexibly applied to End-to-End applications (Li and Zhang, 2011) in large systems. Of course they should obey the QoS (Quality of Service) and SLA (Service Level Agreement) about SOA (Dai *et al.*, 2012).

SOCIAL SERVICE COMPONENTS IN SOCIAL NETWORK

Social computing research content includes three aspects: Computational Social Science, Social Computing Application and the Collective Intelligence.
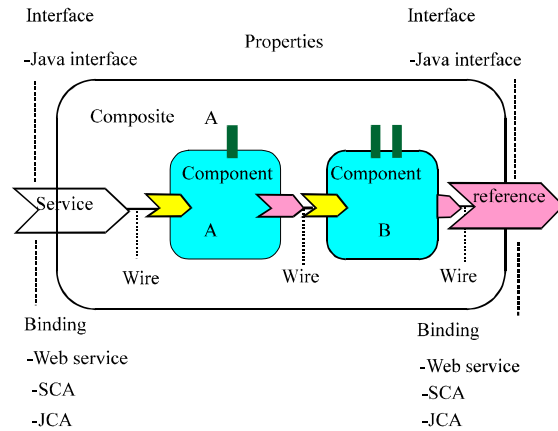

Fig. 2: Method of component oriented programming

Computational Social Science is how to use the computing society operates reveals trends of them; Social Computing Applications research is how to use the calculation system help people communication and cooperation; Collective Intelligence to study how wisdom in the auxiliary machine in the human group cooperation way to solve the problem. Computing Society Science and Social Computing Applications are faces the society, the former are scientific level, the latter belong to the technical level, the Collective Intelligence is not for the society, but based on the society, it is a new computation model of the human brain based on Internet. Society for human society is calculated to recognize the essential rule of
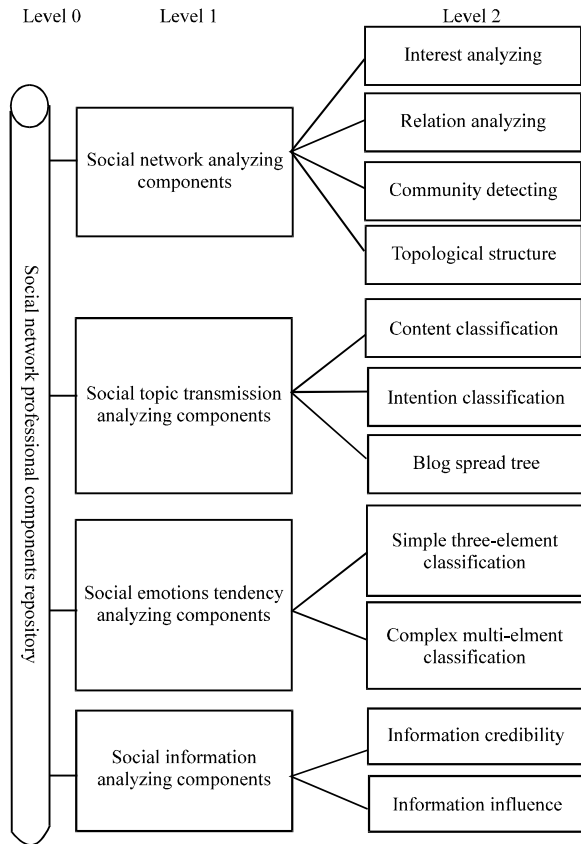
Fig. 3: An example of professional component repository of social network

Fig. 4: The application framework of mobile social application

revolutionary research tool provides, it's great value will gradually revealed and today only a start.

According to the successive researches and applications in social computing field, the professional social service component repositories based on the above component oriented programming have been realized. Figure 3 showed an example of professional component repository of social network. They are adapted to the every-changing demand and also have the excellent expandability.

Social Network Professional Component Repository (Level 0) is composed of Social Network Analyzing Components, Social Topic Transmission Analyzing Components, Social Emotions Tendency Analyzing Components and Social Information Analyzing Components and so forth (in level 1). The components in level 1 may be composed by the ones in level 2. For instance, Social Network Analyzing Components (in Level 1) are consisting of Interest Analyzing Components, Social Relation Analyzing Components, Community Detecting Components and Network
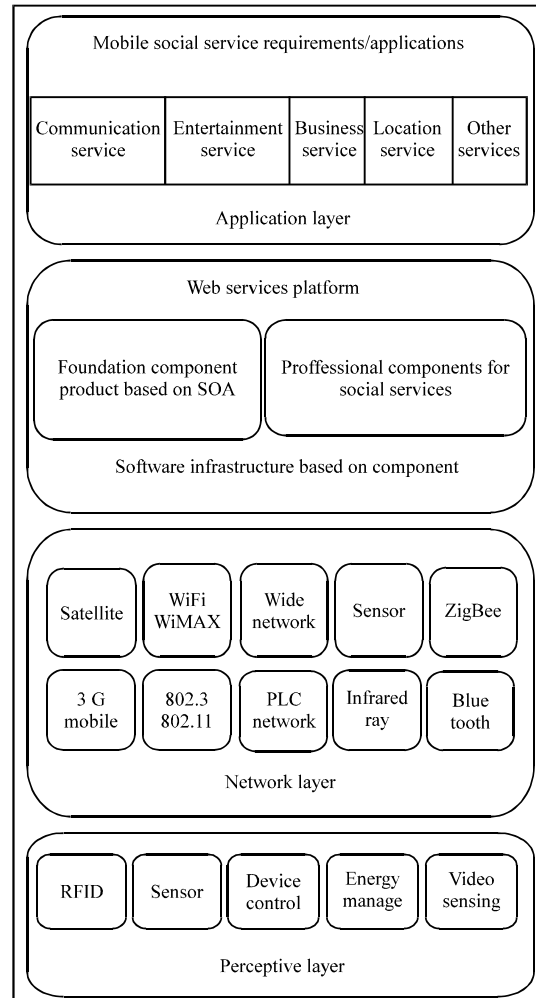
Topological Structure Analyzing Components (in Level 2). Likewise, Social Topic Transmission Analyzing Components can be composed by the three aspects components that showed in Fig. 4. Furthermore, the components in level 2 can also be composed by more components in next level follow suit.

MOBILE SOCIAL APPLICATION BASED ON COMPONENTS

Mobile social application is currently a very wide range application based on mobile Internet technology. It uses the service computing and cloud computing and other new technologies to resolve the various personal problems. It realized the connection between people and

makes people's life more intelligent. It makes the modern applications more popular, such as smart home, smart medical treatment and smart city. And then it makes people's life more convenient. For example, mobile social applications involve communication service, entertainment service, business service, location service and other common services.

The application framework of mobile social application based on SOA, cloud computing and IOT was showed in Fig. 4. It was divided into four layers. Perceptive layer can effectively use information acquisition functions of IOT (Li, 2012). Network layer can use mobile network technologies to realize communication among mobile persons or devices. Software infrastructure based on component offered the important support for higher layer mobile applications. It included Web service platform, foundation component product based on SOA and professional components for social service. On the Application Layer, it offered various common mobile social services. These services were realized according to the service requirements and component technologies.

CONCLUSION

The theory research and practical application of the social computing has made great progress in recent years. The researches of Community Detecting, Social Topic Transmission, Social Emotions Tendency Analyzing and others have becoming hotter and hotter in the future (Gonzalez *et al.*, 2008). It is important to make fusion of social computing and service computing and others such as social science, linguistics and so forth. To research and realize social network should give more attention to the special characteristic features. For instance, network culture and language are very different from traditional ones. They are shorter and have their special expressions. With the constant progress of the above relevant fields, the social network components and systems could be realized with more effective methods and will offer more useful support to find out and solve the new social problems on the social network in the future. Based on the advantages of SOA, more and more useful social service components could be developed and applied in the mobile social applications.

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