The Design and Implementation of SMS Systems Based on Mobile Internet

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Abstract—By analyzing both short message service principles and communication protocols as well as the advantages and disadvantages of short messages, the author probed into operating modes and technical solutions based on Internet value-added services. After completing the analysis, the author designed his own SMS (short message service) platforms on the basis of the Internet and offered advice about it.

Index Terms—SMS, gateway, SMS, platform, Mobile Internet

I. INTRODUCTION

With the increasing number of mobile phone users, short message services offer significant advantages in the mobile phone communications business, such as low fees, stable transmission, reliable communication quality, and rapid information exchange. Improving the quality of SMS systems has been given priority by mobile phone manufacturers, major Internet service providers and mobile phone service providers. Short message services have always been an important platform and information carrier for e-government, e-commerce and information exchange. For example, an SMS is a common means of communication between enterprises and their employees, enterprises and their clients, and a government and its citizens. Through the mobile communications network, the only device enterprises as well as individuals need to send and receive information is a mobile phone that has an SMS platform. To make information management more convenient and to better combine Internet resources with the mobile communications business, we need to develop and set up a dynamic data interactive system that integrates the SMS platform system called SMS Gateway Technology. Individuals can use SMS platform systems to send, receive and manage mass text messages on their websites. By using the system interface, group users and clients can quickly and seamlessly connect the SMS platform to their systems and software, and can easily use both the dynamic and the static application functions of the platform, such as transceiver, query, statistics and analysis, without modifying the original application system. Furthermore, they can access the Internet and mobile communication business.

Seen from the social benefit brought by the SMS platform, it is a software docking tool actually based on the mobile communication network, which connects short message service with the Internet and various business softwares. Development of short message service coherently is linked with the gateway address and enterprise. The short message platform is made for providing short message service for Enterprise, which can also be served as the server end and the client end. Each enterprise has got its own client end and special service number provided by SMS platform. The server receives every client’s request and operates the communication processing in a unified way, which implements transparency, moderate cost, and convenience among the enterprises.

II. The survey on the development of SMS platform

Mobile commerce has been very popular at home and abroad at present and universal in the United States. Mobile commerce has been conducted more maturely in Japan and South Korea, especially in Japan. With the rapid soaring of Internet, blog, Wechat, Facebook and other technology promotes a variety of business collaboration and information exchange mode. Mobile communications are encountered with the mounting wave of Internet technology. Concerning on whether mobile business will become the mainstream of business family or not, Chinese merchants have their own views. Urged by the reality demand and China’s potential for the future development of the mobile commerce, merchants will not stand idly by nature. Internet service providers, wireless operators and equipment manufacturers are paying close attention to its development trend and research related technologies. SMS platform is more safe and a reliable way in the enterprise communication. It must provide a larger related services after constantly optimizing the technology and operation mode.

From the view of the development, the short message service (SMS) has experienced two periods:

(1) The first period - short message service center (SMSC) was the main provider of services and information. In this stage, SMSC functioned as the only information provider and the only data transmission channel, which caused the smaller information volume and the discordance of different short message centers. The advantage of short message service was its independent development, since the information resources, transmission channels and the modes of information exchanges are enjoyed respectively by the short message service providers.

(2) The second period - the short message service uses the information which originated from the internet as a main...
information resource to connect to the internet service providers and to build the interfaces of the information exchanges. Its feature is that the service providers that are acted by affluent message holders and the business providers make up the former deficiencies. With the technologies of internet information exchanges continuously updating and the 3G businesses and smart phones are widely popularized, the information resources platforms, the information transmission channels and the information exchanges modes of mobile communication equipments are no more exclusively applied by short message service. Thus, there comes potential resource competitors and even business survival crisis. This stage compels the short message service only if to break through the traditional technical pattern and original resource channel, can they take the advantages of stable clients and the comparatively safe and dependable information transmission, thus to accelerate the expansion of information spreading forms and channels.

Current short message service belongs to the second period. Its basic service feature patterns depends on the original information transfer mode (SMS), which filter the information that the clients need from massive internet information. They can also send the information through it. This developing mode combines the traditional information provision and service as one, which embodies the developing mode of mutual function of traditional business and Internet.

At the initial stage of the second period, the short message service adopts the way by which the businesses providers directly connect to certain short message centers through which the short messages are sent to the clients. However, when there come large number short messages services the business providers send, short message centers are responsible to forward all of the short texts and the collaterally heavy loads, which can hardly fulfill the needs of businesses development. Moreover, the standard procedure of GSM network is to forward the short messages through the local SMSCs of the clients, if there are no connection between the SMSCs and the business providers, the upward short messages are not able to be sent to the business providers when the clients apply the short message services by SMS ordering.

As its business grows, the transmission of short message is also demanded to follow the GSM’s standard that SMSC of local user sent the message to the recipients. However, there are several problems remained to resolve in this phase of business growth, such as how to make a large number of users’messages access to the SMSC, how to guarantee the consistency and security of such access and how to provide quality services to the users. The short message gateway emerge at the time. The short message gateway, as the message distributor and manager need, becomes the interaction between message providers and SMSC. At present, China Unicom and China Mobile’s GSM message have realized to send message with each other. At the same time, short message gateway is linking with more and more ICP(Internet Content Provider)/ ISP (Internet Service Provider), hence the contents and forms of messages are super abundant.

III. The analysis on the requirements of SMS platform

A. Basic functions of short message platform

1. Operation mode of Internet

The system provides dynamic data operation modes and the third-party web service connection of other softwares to enable enterprises and short message platform users to use, maintain and manage enterprise short message platform through Internet. Its features which are rich resources, a wide range of users and abundant content in business can be utilized.

2. The mode of Group sending short message

The group sending short message, based on gateway group sending function, can enable enterprises to issue internal notification and send messages to a group of clients.

3. Diversity of short message types and forms

The message can be both sent as traditional texts and as well as in form of audio, video, picture and animation. Such function needs further support of cellphone terminal message software.

4. Independent selection of services

To make business on-demand service, subscription and customization happen, the network terminal send specific messages content to the gateway. Thereby, the short message service will expand into a more value-added space.

5. Transparency of consumption information

Within a specified time period, users can inquire and print uplink information, downlink information as well as monthly package information via their cellphones.

6. Statistical analysis and strategy for decision-making

Make a statistical summary about system’s information; such as the number of individuals, traffic of access number, traffic of accounting code, traffic of service code, full recording summary, full recording list, statistical data that have been collected based on SQL(Structured Query Language) and the reporting on the number of users who fail to send messages.

B. The features and the technical difficulties of the system platform

1. The realization of the stable system connection. For instance, the system can be failback when link failure happens between the messages platform and the Internet Short Message Gateway.

2. The realization of the load balance of the system running. For example, the sliding window system of the information stack could control the web traffic and balance the load effectively.

3. The realization of recognition on the smart system information. For example, the same information discards mechanism, and it can ignore the same message you receive.

4. The realization of the low cost of individuals. For instance, the MT database buffering system mechanism.

5. The realization of the integration of the system running.
For example, the system could send and receive the messages instead of the third party at the same time.

6. The realization of the shortcut and usability to users, for example, the new rapid easy online custom service.

C. The guarantee of function and stability about the system platform

1. The ability of the receiving and sending messages could be 1000 items per minute between the system and mobile phone. (it depends on the limit of the Internet Short Message Gateway)

2. If the system is busy when sending messages, the center server could save it and send again when the net is free. The system is busy when you receive, SMS gateway can be sent again within a certain time till it is received

IV. The design of the system

A. The ideas of the system design

The messages system consists of the protocol framework module, protocol function module, individual interface module, database module and data transmission. The system design is based on multi-process module, the different function modules adopt the multithreading technology in order to improve the effective running and service quality of system. The communication protocol adopts the Internet Short Message Gateway and ICP/IP protocol. The stream socket is used to communicate with the Internet Short Message Gateway. As for the receiving and outgoing line and MO&MT processing threads of the communication module, the buffer queue messages of the memory is regarded as the database interface in order to maximize system traffic improvement to the utmost, which separates the sending-receiving and dealing. Communication module and service module are dived scientifically and reasonably. The database is the information carrier between them, the concrete design is realized through MO and MT chart. The system adopts the goal-oriented programming to build the united database interface module in order to avoid the influence of the database type on the system promotion. Each module of the system interacts the information and control through the database interface.

B. The system function structure picture

The system consists of Message receiving interface services, application services, databases, and distributed service SMS Server interface. Their relations is shown in the picture below.

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