

# SEIS- SMS Based Stock Exchange Information System Using GSM for High Availability and Accessibility

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## Abstract

Many organizations and business people are trying to move towards automation and want to access stock exchange news on their mobile phones in order to save time, cost and resources. The proposed system is based on SMS based information system using GSM technology. The system is designed in a way that facilitates stock brokers and businessman to get updates on their mobile phone regarding current stock market state of affairs. The proposed system is beneficial in a sense that it saves resources in term of time, human resources and cuts down the paper work. The proposed system also reduces cost by replacing internet news updates with SMS updates. The proposed system has been developed in view of research study conducted in the software development and telecom industry. It provides a high end solution to the customers/fieldworkers that use GSM and SMS technology for transactions updates of databases and sending SMS.

**Keywords:** GSM (Global System for Mobile Communication), IVR (Interactive Voice Response), SMS (Short Messaging Service), PC (Personal Computer), JMS (Java Message Service), PHP (Hypertext Preprocessor)

## 1. Introduction

The Internet provides a massive amount of dynamic information like news, stock information, current and expected weather status, currency exchange rates, sports information etc. User searches this information according to

their interests. A criterion is defined on the basis of user's interests. SMS notifications can be sent to the user notifying him/her whenever the criteria are met. Admin/Employee can insert, update and delete information from database on need.

The remaining part of this paper contains different sections. In section II the literature review is described, in sections III methodology is described in detail with frame work and mathematical model with explanation, section IV contains implementation, in section V research analysis results and experimental results are illustrated and in last section conclusion and future work is summarized.

## 2. Literature Review

An Automated Stock Price Delivery System Based on the GSM Short Message Service - is a system that is capable of delivering "real time" [1] stock price information from internet based stock price servers to different type of users. The main delivery mechanism for this information is the GSM [1] short messaging service. This system also included an IVR [1] system in for the purpose of supporting an automated delivery process on the basis of speech prompt.

With the expansion of mobile networks, the SMS [2] has been the most well-known data service among people. For making use of the PC's good handling ability, a method is designed of a mobile short message service system of terminal mode. This system can be used in a lot of mobile value-added service applications, sending, receiving, group sending and transmitting mobile text messages real-timely and efficiently.

A solution about building a real-time online stock trading system is given by using the technologies of Ajax, Struts and Hibernate framework [3]. It is implemented by using a framework with all data stored in Oracle [3] database; the data persistence layer is realized by using Hibernate3 framework [3]; validation of form and real-time stock information's updating automatically are implemented by using Ajax technology [3]. It is JMS [3] that keeps the communication among the different modules, like one module of stock data acquisition and another module of analog transaction.

An SMS system proposed that intelligently determines a good way to present notifications to the user at a suitable time. A decision module [4] is made to examine the message content, the relation between the sender and the receiver and the user condition due to new coming message. The consequences of the decision module [4] are used to execute a nicer notification and to reduce breaks to a user's ongoing tasks.

### 3. Methodology

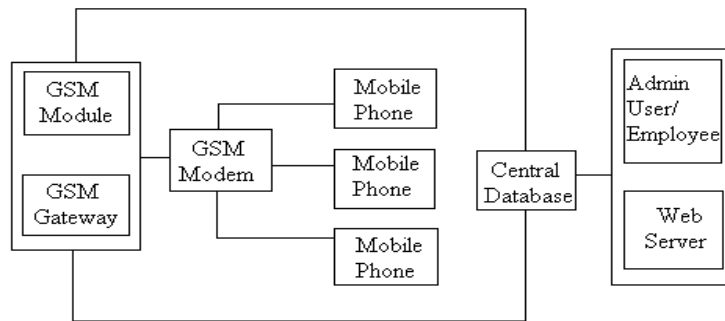


Figure 1: Framework

The working of the system model given in figure1 is as follow:

**Web Server:** Client registers on the website.

**GSM module:** GSM module provides the connectivity to the central database with mobile phone.

**Central database:** Recipients connects to the central database via PHP module and Admin user/Employee connects to central database without using GSM module.

**Admin User/Employee:** Admin can insert, update and delete the records. Admin first connects to the central database and provides login information.

After successful login Admin can perform insertion, updating and deletion of records.

**Bluetooth connectivity:** GSM module connects with application through Bluetooth.

**Mobile System:** All or selected users receive SMS notifications on their mobile phones.

#### A. Client Side

Table 1: List of Factors

Symbols	Description
DB	Database
C	Customer
EI	Enter Information
Aut	Authenticate
E	Employee
Ent	Enter
Linfo	Login Information
CD	Customer Detail
V	View
NC	News Categories
A	Add
N	News

#### Equations:

- Var=E(Ent(Linfo)).....(i)
- Var2=Ant(E(Ent(Linfo))).....(ii)
- Var3=E(V(CD)).....(iii)
- Var4=E(V(NC)).....(iv)
- Var=DB(Sv(E(EI))).....(v)

#### A. Admin Side

Table 2: List of Factors

Symbols	Description
DB	Database
C	Customer
EI	Enter Information
Aut	Authenticate
E	Employee
Ent	Enter

Linfo	Login Information
CD	Customer Detail
V	View
NC	News Categories
A	Add
N	News
COM	COM Port
Co	Connect
M	Mobile
B	Bluetooth
Se	Send
S	Select
SC	Service Center
No	Normal
F	Flash
U	Update
St	Status
Sv	Save
D	Delete
CalT	Calculate Time

**Equations:**

- Var1=E(Ent(Linfo)).....(i)
- Var2=Ant(E(Ent(Linfo))).....(ii)
- Var3=E(V(CD)).....(iii)
- Var4=E(V(NC)).....(iv)
- Var5=DB(Sv(E(A(N)))).....(v)
- Var6=DB(Sv(E(D(N)))).....(vi)
- Var7=B(M(Co(E(S(COM)))).....(vii)
- Var8=CalT(Se(S(No(E(Ent(SC)))))).....(viii)
- Var9=CalT(Se(S(F(E(Ent(SC)))))).....(ix)
- Var10=DB(Sv(St(U))).....(x)

**4. Implementation**

**4.1 Characteristics of System**

Nowadays, in this outgrowing information age people have no time to see

news alerts about stock market on the television or on the internet. This information system is a mixture of network services and infrastructure that provides a mechanism of delivering a notification messages to a single or multiple recipients based mode in which they want to receive message.

**4.2 Strengths of System**

The proposed system has many advantages:

- Sending messages to remote locations.
- For high availability the proposed system sends alerts on mobile phones at the working place/home.
- GSM technology is used to provide connectivity to the central database.
- SMS have lower operating costs and easier implementation. The low operation cost of the system will make it suitable to own by personal or any agency that require remote control and monitor the stock exchange information system.
- The proposed system leads to reduction in internet usage costs.
- Effectiveness for business users to track the stock exchange information in an efficient manner.
- Flash message mechanism is deployed to ease the user.
- Users can easily subscribe and unsubscribe according to their business need.

**5. Results**

Research contains two phases

5.1 Research Analysis Results

5.2 Experimental Results

**5.1 Research Analysis Results**

The research survey is divided into four sections i) Internet and Stock Exchange ii) GSM iii) Importance of SMS iv) Database  
 Sample size is 30 and the results of research are shown in graphs represented by Figure 2, Figure 3, Figure 4 and Figure 5.

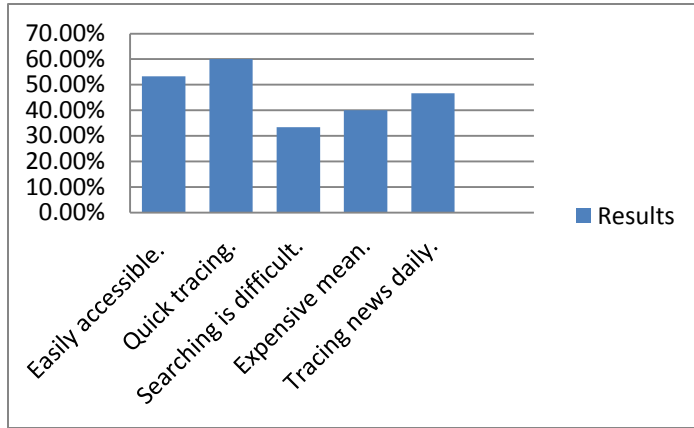


Figure 2: Internet and Stock Exchange

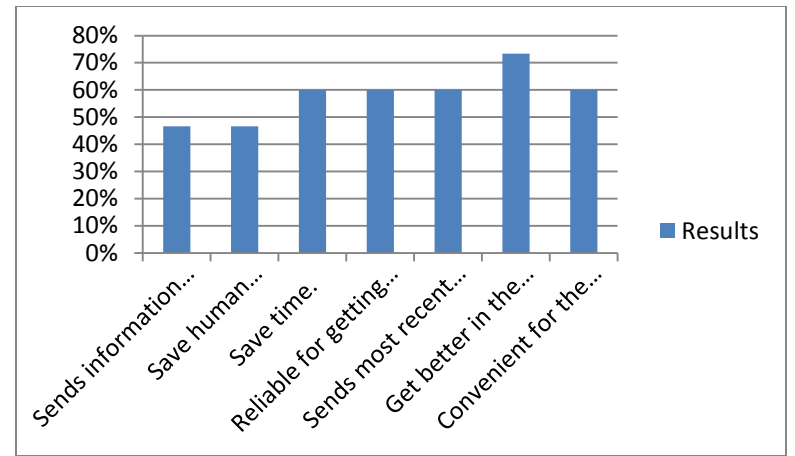


Figure 4: Importance of SMS

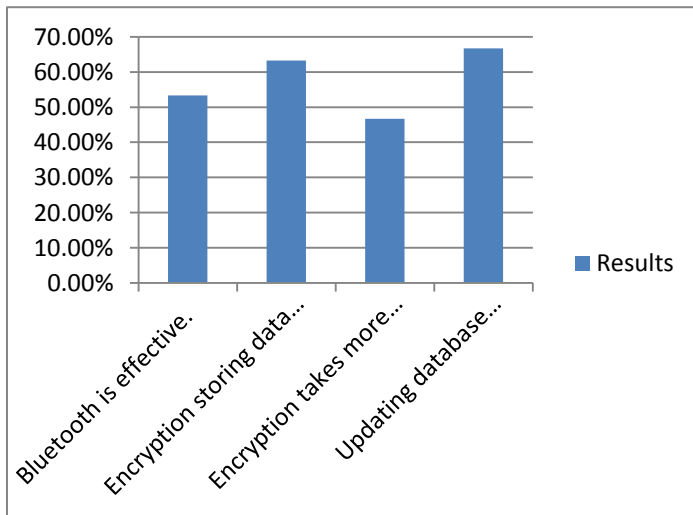


Figure 3: GSM Implementation

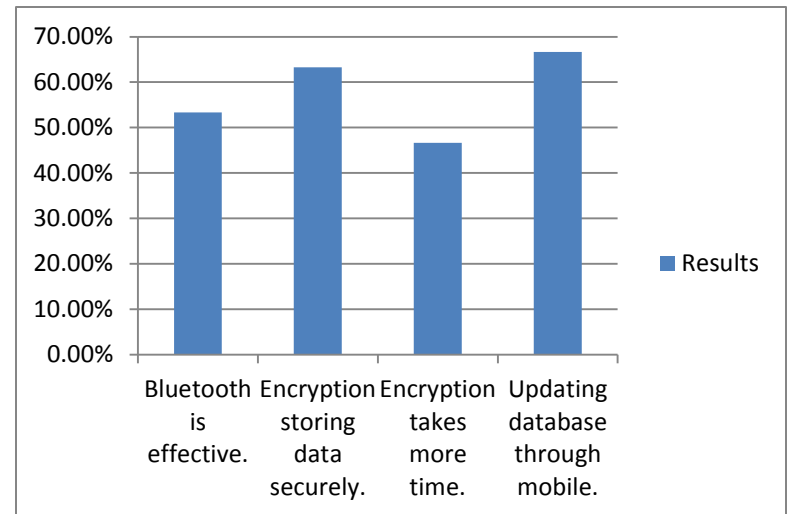


Figure 5: Databases

## 5.2 Experimental Results

### 5.2.1 Time Duration for Sending SMS

Time Format= 00:00:00.0000(hour: minute: second: millisecond)

Table 3: Flash SMS

Number of Messages	Time Duration
One	00:00:03.3011273
Two	00:00:06.1893380
Three	00:00:08.4649481
Four	00:00:11.3181018
Five	00:00:14.7186011

Table 4: Normal SMS

Number of Messages	Time Duration
Two	00:00:05.4315053
Four	00:00:11.5645668
Six	00:00:16.2823748
Eight	00:00:22.5687923
Ten	00:00:27.2543762

### 5.2.2 Memory Usage

#### 5.2.2.1 During User's Subscription

```

\\FAMECOMPUTERS-P
Memory
  % Committed Bytes In Use      26.037
  Available MBytes              1,285.000
  Cache Faults/sec              0.000
    
```

#### 5.2.2.2 During SMS sending

```

\\FAMECOMPUTERS-P
Memory
  % Committed Bytes In Use      25.231
  Available MBytes              1,231.300
  Cache Faults/sec              0.000
    
```

### 5.2.3 Deviations in Processor Time during Sending SMS

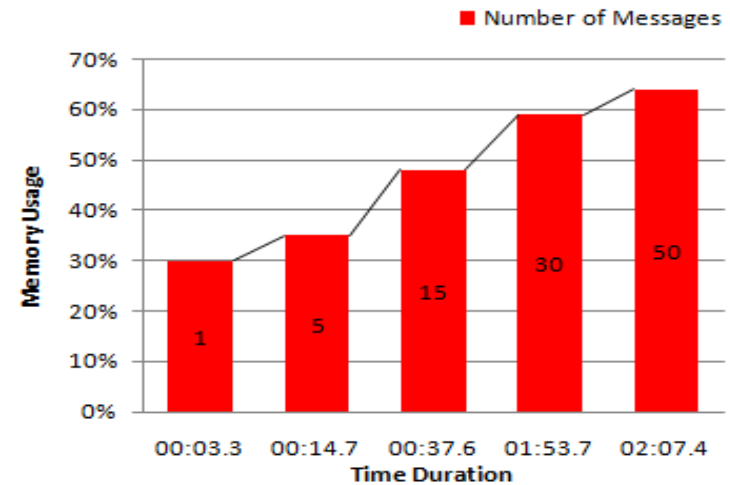


Figure 6: Processor time during sending messages

## 6. Conclusion and Future Work

Organizations can easily move towards SMS based information system, saves on human resources, increase net profit, saves on extra effort by using this proposed system and survey results shows that organizations are willing to pay for such proposed system. For developing applications GSM is the right solution and survey results also shows that people are satisfied with the results of this technology as it is cost saving then internet based information systems [8]. It is a secure mean for data transaction and also saves on network resources. As our proposed system is divided to two applications one is Client side application and other is server side application and both are connected with the central database. Survey results shows that use of databases cut down the paper work and increases performance by updating the databases via mobile phones rather than manually entering the data, encryption data before storing in the database is a viable solution for securing data.

Anyone can use different technology to implement the system other than GSM [5]. Secondly, anyone can use the same technology but can use different method to connect to the application instead of Bluetooth. Third, anyone can add the additional functionality that customer have more ways for extracting desired information from SMS. Fourth, If GSM [5] [6][7]service is not available in an area then the mobile user is provided with some mechanism that he/she update status locally in the database that is available in his/her mobile and when GSM facility is available then he/she sinks the local database with the central database. Fifth anyone can make a system that sends information related to stock exchange on real time.

#### References:

- [1] F.Dermot, and K.Liam, "An Automated Stock Price Delivery System Based on the GSM Short Message Service", Communications, 1998 98. Conference Record. 1998 IEEE International Conference.
- [2] H.Xu, B.Tang, S.Zhou, and N.Jiang, "Design and Implementation of Mobile Short Message Service System of Terminal Mode", Intelligent Computation Technology and Automation (ICICTA), 2008 International Conference
- [3] S.Huazhu, Z.Mingzhi, and X.Zhuang, "Design and Implementation of Online Stock Trading System", Computational Intelligence and Software Engineering, 2009. CiSE 2009. International Conference.
- [4] G.Tiantian, Y.Zhiqiang, W.Heng, "Providing SMS Notification with Less Interruption", Cyber-Enabled Distributed Computing and Knowledge Discovery(CyberC), 2010 International Conference.
- [5]<http://www.nowsms.com/doc/configuring-sm-sc-connections>
- [6]<http://www.cellular.co.za/gsmhistory.htm>
- [7][http://www.tutorialspoint.com/gsm/gsm\\_architecture.htm](http://www.tutorialspoint.com/gsm/gsm_architecture.htm)
- [8] Nazia Bibi, Tahira Mahboob and Sikandar Hayat Khiyal "GPRS Based Mobile/Device Connectivity Shifting from Manual to Optimization for Performance Optimization", ISSN (Online): 1694-0814, IJCSI Vol 8, Issue 5 No.2, Sep 2011

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He has been associated with the field of education for over than 10 years. He got his Master's Degree from Center for Advanced Studies In Engineering, Islamabad. Currently working as Information technology Manager at Duniya News Channel and Center for Advances Research in Engineering, Islamabad. He is well versed with projects of mobile automation, information security, parallel processing of super computers and computer networks.