

A RELIABLE SERVICE ORIENTED SYSTEM BASED ON THE PRESENT SMS TECHNOLOGY

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Abstract

This paper is oriented towards developing a reliable service oriented system based on the present SMS technology. We have integrated three different applications independent of each other. All these three applications make use of common SMS send/receive messaging library. We have implemented three modules they are Appointment management system (A.M.S), Retail management system (R.M.S) and Bug tracking system (B.T.S). In AMS the doctor or the medical administrator maintains a list of appointment schedules. This environment involves dynamic rescheduling and fast messaging of appointments in critical cases. BTS involves fast tracking and transferring of software bugs in case of short deadlines. Prioritizing the sent procedure is of utmost importance in rapid software development scenarios. The RMS environment involves a constant reminder of lucrative and attractive offers to the customer in the endeavor to earn more profit and improve customer satisfaction.

Keywords-SMS technology, AMS, RMS, BTS

1. Introduction

Today we can't imagine our life without one important thing, the mobile phones. Mobile phones became popular due to its cheapest cost and services and hence has become an integral part of our day to day life. In this paper we have used SMS as a simple and effective mode of communication. SMS service overcomes the drawbacks of a direct communication as well as connection oriented call. We choose this service to reduce the cost, wastage of time, reduce customer's involvement and proper service. In this

paper we have implemented three modules Appointment management system, management system and Bug tracking system. Our paper deals with variety of services that can be provided through SMS in mobile communication. Our software provides an innovative yet reliable medium of communication. It can be utilized to boost the performances of all the three areas i.e. Appointment management system, Bug tracking system, Retail management system. Generally the system is deployed in the organizational workflow environment; the environment differs according to the types of functional operations carried out. In this paper we have implemented three modules and they are (1) Appointment Management System-Taking appointment through SMS. Doctors will use our system to check the appointment at particular date and time. This involves the doctor or the medical data administrator to maintain a list of appointment schedules along with the details like patient-id, phone-no and also grouping among same type of problem cases for easy treatment. This environment requires dynamic rescheduling and fast messaging of appointments in critical cases. (2) Bug tracking system-Tester will use our system to enter the bugs found in his/her work and if the bugs are high priority then that bug report is sent to the project manager through SMS. This involves fast tracking and transferring of software bugs in case of short deadlines. Prioritizing the sent procedure is of utmost importance in rapid software development scenarios. (3) Retail management system-In retail super mall part our system will give the idea of the products and where they are present right now and how much discount one can have on that through SMS. This environment involves a constant reminder

of lucrative and attractive offers to the customer in the endeavor to earn more profit and improve customer satisfaction..Our software comes as a promise of better utilization of services and quick response generation in critical times.It can integrate itself with the present setup of application and hence can act as main set of services in extreme situations or as a supplementary set of services when main functional stream is in complete flow.This would ensure reliability and quality of service.We have used .Net Framework C# and ASP.Net along with SQL Server 2000 database.

2.SMS Multi-utility

We have implemented three modules but it can be used for several other modules in future.We have provided a better way of handling the three modules in effective and efficient manner by using SMS service.Fig 1 shows the architecture of the software and the intended function it has to perform while

interacting with a variety of users and catering to their requests.The software operates on .Net framework and uses SQL Server for database operations.The main component is is the SMS component which is being accessed by other three subcomponents or modules of the software.These three components are A.M.S,R.M.S and B.T.S.All three components are independent from each other and do not interfere in each other's functionality.Each component receives input from individual database for the particular component and performs functions and operations as per the embedded code or set of routines in the component's source code and generate response in the form of response to a destined user of the application in the form of SMS. AMS,BTS and RMS processes are initiated through authentication and execution involves series of data access processes.Fig-1 shows the architecture of the software and the intended functions it performs while interacting with variety of user,

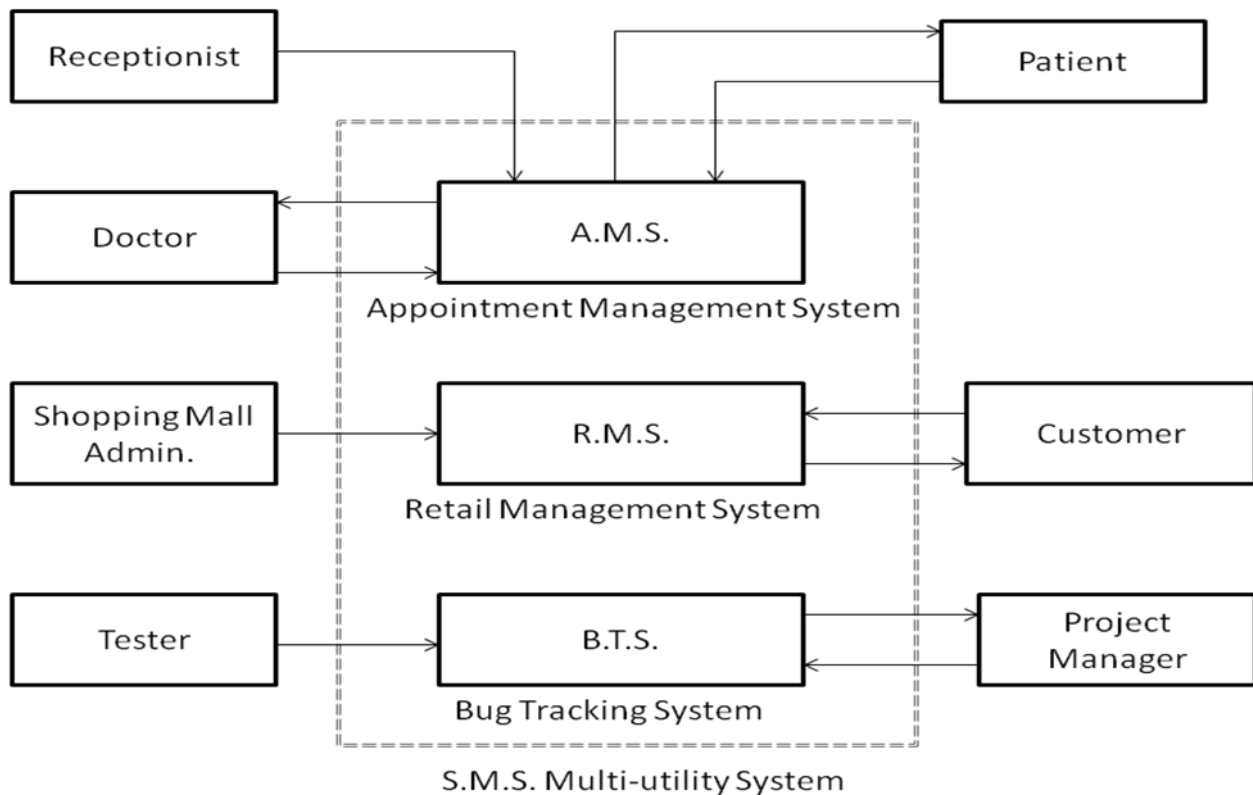


Fig-1 SMS Multi-utility

Since many organization focus on security and authentication mechanism for their business operations we have also deployed them in our software for safety measures through username and password identification. Proper GUI design is one feature we intend to add to attract users and speed up navigation through the interface. We have implemented three modules which are;

A.M.S-This component is designed to send appointment schedules to doctors and their patients in the form of SMS. These SMS cant have more than 180 characters if they exceed then it can be another SMS of 180 characters to the same destined user. The schedules are prepared through database access by the receptionist or assistant to the doctors using SQL server 2005 database package. The SMS are sent through .NET coding S/W interface to the destined user.

R.M.S-This component is designed to send attractive offers and discounts on a range of commodities available in a shopping mall to the visitors of the mall, the constraint is that the SMS can be received at

the visitor phone if and only if he or she is inside the mall otherwise SMS cannot be sent. The offer SMS are sent to the visitors in the proximity of the mall from the mall's database administrator which again uses the above mentioned s/w packages.

B.T.S-This component is vital for s/w testers, it's basic goal involves the tester to list out bugs and errors in the software deployed and thereby sending the through the same SMS component to the project manager for finding solutions, the project manager at the other end can employ a similar kind of logic to sent solutions for each bug and error back to the tester to repair the s/w at his end and make s/w deployable. The software involving bugs and errors are in c# or ASP.NET to make the compatible with the SMS component.

Software Development Life Cycle (S.D.L.C)

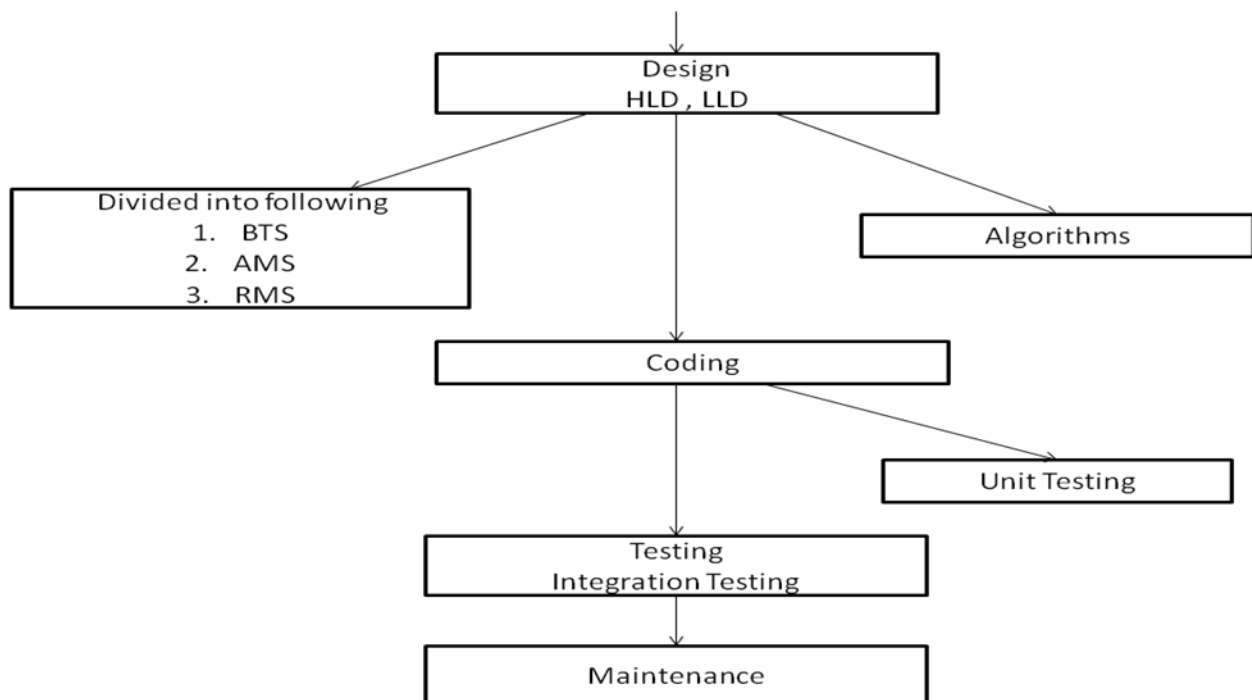


Fig-2 software development life cycle

3. Analysis

3.1 Reliability

The reliability of our system can be described using four factors.

(1) Availability-The software is available most of the time depending on the deployment environment. 24 hour availability can be achieved in case of critical scenarios, periodic maintenance is advisable through short span of fortnights to ensure compatibility and efficient working by following a specified testing procedure mentioned in the test plan. The maintenance can be carried out through both at customer premises by customer staff or through service provider after inspection of testing reports.

(2) Mean time between failure-All applications though are integrated together using the same software technology they operate independently. The failure of one module would not cause a heavy impact on the total system but definitely slow it down till the failure detect operations get completed. The estimated mean time between subsequent failure would be increased 6 to 7 months.

(3) Mean time to repair- The system need to undergo fault detection procedures, testing procedures, recovery procedures, retesting procedures, reinstallation of the software back at the customer premise. This would take a week for reliable delivery of the software.

(4) Accuracy-Accuracy of the intended operations performed by the system completely depends on the complexity of code and time required to generate output. Accuracy of the code can be ensured by less hardware references and efficient use of system resource available. Code complexity can be reduced by using Big-Oh notations.

3.2 Performance

The system is oriented to generate maximum performance in all testing conditions. The major transaction is message delivery in the form of SMS. Maximum performance can be judged by the

accuracy of message delivery i.e. the message reaches the correct destination host in quick time within a few minutes. The message acknowledgement feature would thereby guarantee the achievement of maximum performance.

(1) Response time- Response time for an application is a minimum of 1(1/2) minutes in case of medical transaction in critical cases like accidents or treatment of pregnant ladies. For not so critical and commercial applications response time could be a maximum of 3 minutes.

(2) Throughput-It is a measure of maximum number of transactions executed in unit time in our system is the maximum number of messages delivered to the desired destination in minimum amount of time span, we endeavor to achieve a throughput of at least 7 to 7 SMS in 2 to 3 minutes.

3.3 Supportability

Our software supports any windows OS with .Net framework. Still some more embedding applications need to be incorporated in it to increase its overall supportability and speeding of operations. Like message counter can be incorporated in it for monitoring all time system performance and making future predictions on the behavioral aspects of systems. Present software does not display the time at which at which the SMS has reached the particular destination, i.e. message acknowledgement thereby we cannot determine when other reliable communication media to be utilized.

3.4 Feasibility

In this paper we have also performed the feasibility check on our software. The feasibility check was carried out in following aspects:-

1. Technical Feasibility-The technical requirements for this system are ASP, SQL Server 2005, .Net Framework and Microsoft Visual Studio 2005. The system will not require any special kind of hardware or software and will operate smoothly on windows platform. Also compatible with browsers like

Safari, Netscape, Mozilla Firefox, Internet Explorer and many more; hence it can be accessed from any pc or workstation.

2. Operational Feasibility-As the market is aiming at the AMS, RMS, BTS automation to achieve the concept of the “mobilization” through SMS. This will be the first step in that direction. Due to mobilization, there will be tremendous cut down in manual interaction and save lots of man-hours that get wasted. The proposed system will be operationally feasible because man-hours will be saved and coordinator and communication will be more. The system will not require any special kind of training or expertise for the usage and will be quite transparent to the end user.

3. Economical Feasibility:- As the software and hardware is easily available no additional cost will be incurred for the computerization. The system will reduce a lot of man-hours that get waiting in long queues for hours in hospital and also travelling cost will be saved. The customer will receive accurate and up-to-date information wherever and whenever required for quick and speedy decision making. It will reduce travelling expenses reducing cost and time. Considering the hardware cost, personnel cost, operating cost, the proposed system is economically feasible, which provides some tangible and some intangible benefits to the organization.

4. Conclusion

We have successfully implemented “A Reliable Service Oriented System Based on Present SMS Technology”. A variety of services can be provided through SMS in mobile communication. So far we have used this for only three applications i.e. Appointment Management System (A.M.S), Retail Management System (R.M.S) and Bug Tracking System (B.T.S) but in future it can be used in wide variety of applications. We have followed the Software Development Life Cycle (S.D.L.C) for development of our system. Our service oriented system can be utilized to boost the performances of modern business and service oriented industrial era. We have also done the analysis of the system. We have performed reliability, performance, supportability check along with feasibility check on our system. In our system data remains secure even after the crash

of the system. Fast rescheduling and prioritization of time critical scenarios is the key feature of our system. Our system ensures reliability and quality of service.

5. Future Work

This software can be generalized to such an extent that it can even be used in wider applications like reservation of railway tickets through mobile phones. For this software we have used database which has been explicitly created for this project. We would like to make the software compatible with any kind of existing multiplex database. This would avoid the redundancy of re-entering the values in the new database. Since security is one of the most important aspect for any organization we can increase the security level according to our wish and requirements. In future we can also use GPRS to send SMS to avoid delay and increase output and also reduce cost.

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