Chapter 1

Introduction

1.1 Background and Motivation:

Hutchison Telecommunications Lanka (Private) Limited ("Hutchison Telecom Lanka") commenced operations in Sri Lanka in 1997. Hutchison Sri Lanka has expanded its coverage area to include all major towns in the country, providing its customers with affordable and easily accessible mobile telephony services.

Hutchison Sri Lanka operates with two ZTE ZXG-10 (GSM) mobile switching systems and single ZXWN NGN core network (IP switch) which is using as a Gateway switch.

With 1.3million customers in HLR (Home location register) and around 350,000 in VLR (Visitor location register) Hutchison Sri Lanka operates more then 600 BTSs (Base transceiver station) all over the country.

Alarm Monitoring plays a critical role of Site maintenance. Hence it is known as one of the key factors that OMC needs. Uninformed Site failures results lots of blame and loss of money. Figure 1.1 shows the alarm generation process of Hutchison existing Alarm Monitoring system.
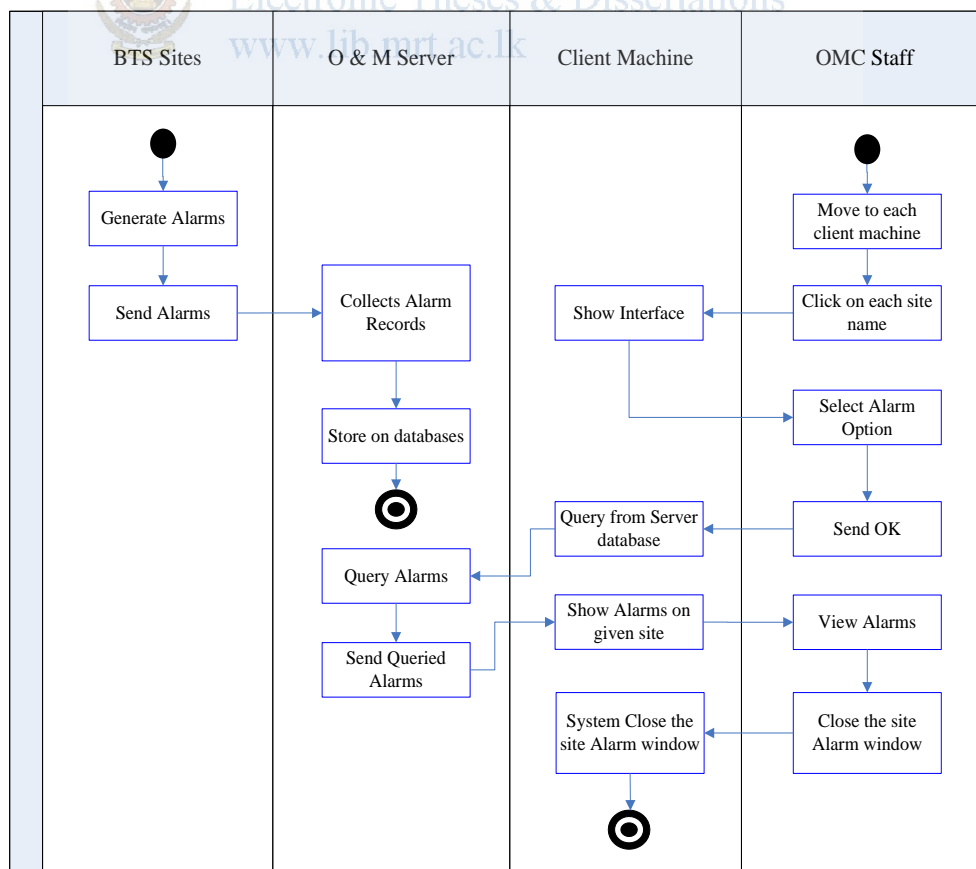

Figure 1.1 - Process Activity Diagram

With daily maintenance works OMC (Operation and Maintenance Center) staff facing difficulties with wrong alarms and risk on them due to uninformed failures. As the alarm monitoring system is not perfect they send technicians here and there with out knowing the real situation of rural BTS sites. Once the technicians found there is no such fault or the problem is difficult to solve. Then arrange different staff such as engineers or experts. Again allocate transport, waste time due to wrong alarming. From the customer side it increases the number of complaints and customers not satisfy with delaying to recover the failure.

To avoid this situation Hutchison need an alarm monitoring system with real-time alarming and exact alarm details to rectify the problem. Above is the story behind my idea of a system especially for alarm monitoring.

1.2 Aim and Objectives:

- The main objective of this project is an Alarm monitoring system for GSM sites located in all over the country. Following are the main objectives of the project.
- Critical Alarms can be identified at glance.
- Failure reason can be easily identified.
- Alarms must be shown in different colours.
- Must not play alarm sounds unnecessarily.
- Alarms response must be real time.
- To study how Object-Oriented software development approach can be applied in this domain at first time.
- To use Object-Oriented approach for the first time in my software development.
- To test my software development skills.

1.3 Solution

Produce an alarm monitoring system only for all BSC & BTS alarms showing on one specific client machine. Additionally one switch need to interconnect all servers into one network. Figure 1.2 shows this proposed system model. All the alarms of above 5 Servers are shown in the Alarm client machine.

This project has the Unified Software Development Process & Object Oriented Approach along with Unified Modeling Language
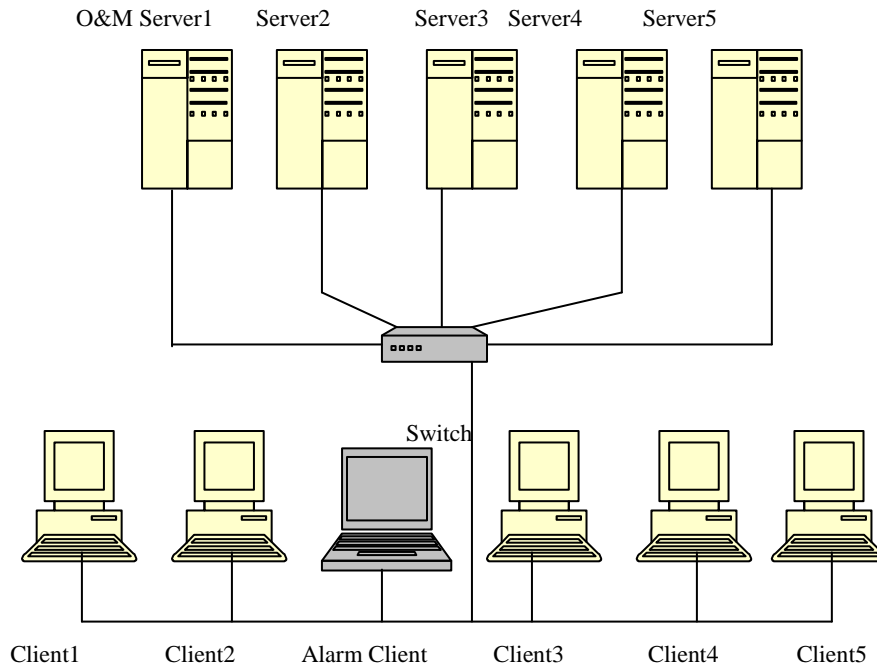
Figure 1.2 – Proposed model

1.3.1 System Requirements

The proposed system needs 1 additional Client computer to view the Alarms. And the Alarm client must be interconnected through local area network. The client already holds these requirements with existing Alarm macro system and hence there is no need to invest on purchasing computers and installing network system. Development of the system is done at no cost.

1.3.2 Reliability Requirement

The system never fails due to power problems. Because Hutchison Alarm monitoring System located in their main Operation Center. The Generator automatically switch on when commercial power fails, if Generator fails will supply the battery power, battery bank with 48 hour duration capacity

1.3.3 User Friendliness

Standard color schemes, font types, font sizes should be used in the proposed system to increase the user friendliness. Standard interface designing models should be used in the system. This can avoid the user surprise from the system.

1.3.4 Meaningful system messages

System should present meaningful messages to user when prompting alerts, error or any instructions.

Please refer to the feasibility Study in Appendix A for more information.

3

1.4 Structure of the dissertation

Chapter1: Introduction to the project

Chapter2: describes the problem domain - Alarm details, existing system Overview, problems and weaknesses of the existing system and description of existing alarm macro program and its weaknesses.

Chapter3: describes the Technology adapted – OOA and OOD, Unified modeling language, Development methodology and Unified Development process.

Chapter4: describes the approach selected for the Project. Project Scope, Feasibility study, Technical Feasibility, Organizational Feasibility, Legal Feasibility. Alternative systems can develop other than the above system, Cost benefit Analyses are available in this section.

Chapter5: Analysis and Design – Existing system analysis with existing Use-Cases, their Use-Case descriptions and existing activity diagrams. Design stage with proposed system Software requirement specification, proposed system Use-Case, their Use-Case description, proposed activity diagrams, grammatical analysis, sequence diagrams, Class diagram, ER modeling diagram, and relational data bases and normalization are described here.

Chapter6: Implementation – Implementation Details for Use-cases Alarm Show, Alarm Maintenance, Maintain Alarm Codes, Insert Record, Priority Level, Integer validation, Maintain Commissioned Site's Alarm History, Add existing Site Name, Delete not existing Site Name are available in this section.

Chapter7: Evaluation and Testing – based on each Activity Diagrams Project assessment, Achievements, Testing, Testing approach, List of test cases are described.

Chapter8:- Conclusion & Further work – Key goals and whether they are achieved, Limitations, Suggestions to overcome problems and further works to be carried out are available in this section.

References:

Appendix:

4