WEB PORTAL FOR SUBMARINE CABLE MANAGEMENT SYSTEM (AAE-1)

Harsha S. Bhat[1], Anantha Murthy[2], Chandrka Deshapande[3]
[1]Student, MCA Department, NMAMIT, Nitte
[2]Asst. Professor, MCA Department, NMAMIT, Nitte
[3]General Manager, Reliance Jio

ABSTRACT
Asia-Africa-Europe 1 (AAE-1) is a 25,000 km submarine communications cable system from South East Asia to Europe across Egypt, connecting Hong Kong, Vietnam, Cambodia, Malaysia, Singapore, Thailand, India, Pakistan, Oman, UAE, Qatar, Yemen, Djibouti, Saudi Arabia, Egypt, Greece, Italy, and France. The AAE-1 cable will have a capacity of more than 40 terabits to supply the broadband market across Asia, Africa and Europe.

China Unicom initiated the AAE-1 cable project in 2011, with the support and partnership from Telecom Egypt. The AAE-1 consortium, which obtained the construction and maintenance contract in 2014, consists of 17 carriers, including British Telecom, China Unicom, Chuan Wei, Djibouti Telecom, Etisalat, HKT (PCCW Global), Mobily, Omantel, Ooredoo, PTCL, Telecom Egypt, Telecom Yemen, Viettel, OTE Globe, Reliance Jio, Time.com.

In general the Web Portal serves as the Gateway for all the Functionalities that are required to manage a Submarine Cable System. As far as AAE cable is concerned Reliance Jio Infocomm Limited (RJIL) has acquired the license for installation and maintenance of the Cable in the India region. RJIL is also acting as Network Administrator for AAE Cable and has acquired the license to provide a platform for the maintenance of the Cable.

INDEX TERMS Internet of things, health care, services, applications, networks, architectures, platforms, security, technologies, industries, policies, challenges.

I. INTRODUCTION

Cables are the basic medium of transmission of data on the Earth. Cables are laid across Earth on both land and in Sea. The Cables which are laid under the Sea are known as *Submarine Cables*, these Submarine Cables are used to carry Telecommunication Signals across the Globe to connect different Countries. Submarine Cables are laid in the Sea bed between land-based stations to carry Telecommunication Signals across stretches of Ocean to different Countries. These Cables are deployed and used by almost all Telecommunication Companies of all Countries for transmission of their signals so that the Users will get high speed access of data and the calls can be connected to different countries easily. In Networking field there is no Concept of Wireless exists, because everything is wired in the Network, only wireless scenario comes in the End-to-End connectivity of the network in which network has to be accessed from the mobile devices or any other hand held devices, then the Wireless Concept comes into the picture, to provide connectivity to the devices that are not stable in a single place.

The data or internet that each individual is using is travelled or transmitted through these Submarine Cables only, currently there are around 200 Entry and Exit points for these Cables and everything is passed in these points

only. At the present time whole of the world is interconnected by the Submarine Cables or in other words whole of the Globe is wired to provide the End-to-End Connectivity to the Customers. One Important thing to note is that, the data on the Network can be passed either through Satellite or through Submarine Cables, but nowadays all most all Networking transmissions are done through the Submarine Cables only, the reason why Submarine Cables have gained this much importance is that, it is cheaper and very fast than the Satellites. So Submarine Cables play an important role in the Telecommunications World.

Optical fibres are used in the Cables to transmit the data, these Optical fibres transmits the data in the form of Light and transmission speed of these optical fibres range from 1 Gbps to 10 Gbps, hence it is the fastest way of transferring data. At this Current time as we speak each and every Country has at least one Submarine Cable connected to it, likewise there are many Cables currently laid across the Globe connecting different Countries to carry out the telecommunication and internet
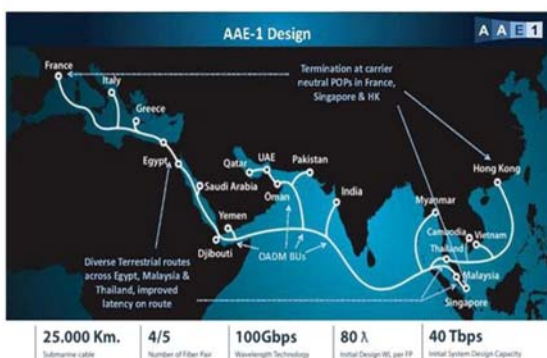
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FIGURE 1. AAE – 1

One such Cable is Asia-Africa-Europe-1 (AAE-1) as the name only depicts, it is the Cable that passes through three Continents Asia, Africa and Europe, here "1" in AAE-1 stands for "Asia Africa Europe Phase-1". Asia-Africa-Europe-1, in short we call it as AAE-1. It is unique in many ways and it is a next Generation Cable System, AAE-1 is built by the consortium of 18 global telecom service providers, and it is said to be the largest newest cable constructed, it links all major Asian, African, Middle Eastern and European nations, via the lowest latency subsea route. The Cable connects France, Italy, Greece, Egypt, Saudi Arabia, Djibouti, Yemen, Qatar, UAE, Oman, Pakistan, India and Myanmar then

onwards to Singapore and Malaysia with Thailand, Vietnam and Hong Kong. With the length of 25000 kilometres, it is the longest cable that is being laid in the Ocean currently in the Whole World.

It deploys a 100G technology and also with a future-proof design that will accommodate advancements in optical technology in near future. As said earlier AAE-1 possess many unique features in it and the most unique feature of that is, while it terminates at two Pop's in Singapore, it also continues further into Asia via diverse terrestrial routes across Thailand connecting Vietnam and Hong Kong. This routing enables AAE-1 to have one of the lowest latencies between Hong Kong, India, Middle East and Europe.

AAE-1 system also provides future proof connectivity to the Gulf countries such as UAE, Oman, Qatar, and Saudi Arabia and to Countries in Africa such as Djibouti and Egypt as well as critical subsea connectivity to emerging markets in Yemen, Pakistan, India, Myanmar, Thailand and Vietnam. Connecting to major Pop's in Hong Kong, Singapore and France, and also AAE-1 members have the option of choosing their preferred backhaul providers available in these Pop's or in AAE-1 (CLS) Cable Landing Stations in Asia, Middle East, Africa and Europe.

1.2. PROJECT DESCRIPTION
Once the Cable has been laid for the Transmission purpose it has to be maintained, so that the transmission of data in the Cable occurs smoothly, so in order to maintain a Submarine Cable a lot of functionalities are to be provided and there will be different category of people present to handle these functionalities such as on field engineers, NOC (Network Operations Centre), offshore industries, etc. Usually there will be a lot of functionalities in the *Submarine Cable Management System* and there will be different people present to handle different functionalities in the Cable System, So to handle all these functionalities or in other words, to maintain a Submarine Cable a platform has to be needed, that platform is provided by developing a Web Portal by integrating all the functionalities for all the different types of users within it, so that all category people can access

their respective functionalities through a single platform to maintain the Cable.

In general the Web Portal serves as the Gateway for all the Functionalities that are required to manage a Submarine Cable System.

As far as AAE cable is concerned Reliance Jio Info comm Limited (RJIL) has acquired the license for installation and maintenance of the Cable in the India region. RJIL is also acting as Network Administrator for AAE Cable and has acquired the license to provide a platform for the maintenance of the Cable. Hence a Portal is being developed for the management of AAE Cable.

The proposed Portal provides interface between the NOC (Network Operations Centre) and End Users by providing various functionalities to manage the AAE Cable.

The Major Functionalities provided by the AAE Portal are, Network Discovery/Inventory Management

Users can request for new Circuits form other Countries or can request to cancel the existing Circuits based on the User/Clients requirements and this is known as *Capacity Management.* Users can/will raise Tickets to inform about any fault in the Cable that is to be corrected, and the higher authorities will resolve these tickets and will update the users about the resolved tickets

Through the Portal, this is known as *Trouble Ticket Management.*

Other Functions include like providing Contact details about the Organization i.e. about Reliance Jio Infocomm Limited and about the NOC (Network Operation's Centre), suppose if some users wants to contact NOC or Organisation directly, they can as their Contact details are provided in the portal.

Portal provides KPI's i.e. Key Performance Indicators through *Dashboards* it means that all the data or information that a User needs, will be displayed in a pictorial view so Users can get to know the Statistics of data or works that has been done by just taking a glance at the *Dashboards*.

Users can access various *Reports* like backhaul provider's reports, Trouble Tickets reports,

Change Tickets reports, System port tickets reports etc. through the Portal, these reports contains detailed information regarding the topic on which they are made like and there is options present like *Blogs* and *Project Status*, Users can add their opinions on the Portal through the Blogs and if there is any new project addition to the AAE those information can be updated in the portal with the Project Status option.

Portal also contains *User Manual* as a reference to the Users as how to use the Portal.

2. LITERATURE SURVEY
2.1 EXISTING AND PROPOSED SYSTEM
a. EXISTING SYSTEM
Currently there is no specific platform dedicated to maintain the Submarine Cable, but there exists a tool currently in the Organization which can be used to manage the cable, it is a Ticketing Tool.

This Ticketing Tool is used to raise tickets to inform higher authorities for any problem that occurs in the Cable and that Ticket will be resolved and updated by the authorities. But this tool is not specifically dedicated to the maintenance of the Cable it is a general tool used internally by the Organization, so it performs whole lot of functionalities that are not relevant to Submarine Cable Management System only. By using this existing tool a Cable Management User will get lot of other functionalities which are not related to him and there is a chance of misusing the tool by the Users as the same tool is used by the organisation for various functionalities. And also this tool is used by the Organization with certain amount of cost and the organization cannot afford to provide
Access to this tool for all the 19 Countries Users openly. This tool is not explicitly for Submarine Cable Management System, it is a general tool with lot of Functionality or capability. Ticket rising is a part of this tools functionality and it is complex in providing the functionalities.

🔻 **Limitations of Existing System,**
Tool is used internally by the Organization with certain amount of cost Provides whole lot of functionalities that are not relevant to Submarine Cable Management System.
Existing Tool is Complex in nature.

Chances of Users misusing the Tool are more as it has got various Functionalities related to other business functions.

Tool is used by other projects too, not specific to any single project.

b. PROPOSED SYSTEM

With the Aim to overcome the drawbacks of the Existing System, a new Portal is being developed with only the functionalities that are required in managing the Submarine Cable. I.e. a Portal dedicated specially for the maintenance of the Cable.

But here also we use the Existing System only but all the functionalities that are not relevant to the Cable Management are hidden from the Users, i.e. Web Portal is developed as a front end and only the functionalities that are required is displayed for the Cable Management Users.

Here the Complex Existing tool is made much Simpler for the maintenance of the Cable. And also there won't be any chance of misusing the tool by the customers/users in the proposed system and more over it is not a Tool, it is a Web Portal so any Customer with a computer system and an Internet Connection can access this Portal and can carry out the Operations. All the Functionalities related to Submarine Cable Management System are integrated and is provided to the Customers.

This Portal is used by both Customers and End Users, as Customers raises a Tickets or make some requests that will be sent to the NOC (Network Operations Centre) and NOC people will check and will resolve the Tickets or problems and will update in the Portal, so this Proposed System acts as an Interface between End Users or Customers and to NOC (Network Operations Centre).

✦ Advantages of Proposed System

Internal Tool is not used directly for Ticketing Operations

Web Portal is developed with UI (User Interface) that is appealing to the End Users (Customers) and NOC (Network Operations Centre)

Complexity is reduced

It is not a Tool it is a Web Portal, so any one can access

Only a Computer system and an Internet Connection is required to access this

No need to Educate the Customers/Users about the Tool

2.2 FEASIBILITY STUDY

Feasibility study is made to see if the proposed project i.e. the AAE project will serve the organization efficiently on completion for the amount of hard work and time spent on it. By carrying out the feasibility study developers can analyse the project's future and its use for the Organization. Some of the Feasibility studies done on this project are Technical, Social, and Economic feasibilities.

a. TECHNICAL FEASIBILITY

In this the system is evaluated from the Technical point of view, and detailed study is done on the Technical aspect of the System.

The Existing Technology in Organization is sufficient for the development of the System, as the existing technology is of latest technology, so the system will not become obsolete anytime soon and it can be modified in future to meet the changing requirements.

The tools which are used also exits in the Organization and the Software's which are used to develop the System are of Open Sources i.e. freely available on the internet, hardware's are nothing more than a Computer system and an internet connection, so the system can be developed with minimal Constraints, with no extra Technologies, Software's and Hardware's required for the project are Technically Feasible for the Development.

b. SOCIAL FEASIBILITY

Here the System is evaluated from the Social point of view, and detailed study is done on the Social impacts on the Organisation or on the Community of people who uses the newly developed System.

First of all any part of people either in Organisation or in Community who will use this will not be affected in any way, instead it will help them very much to carry out their functions

easily and it is the only platform which they have got to Use for their works. Hence there is no change in any work flow of any people and this newly developed System will not affect any person's job, Hence there is no change in any negative way to the System, so the Proposed System is socially feasible for development.

c. ECONOMIC FEASIBILITY

In this the system is evaluated from the Economical point of view, and detailed study is done on the Economic or Cost aspects of the System.

The Tools and Technologies used in the development of the System are the Existing ones hence any type of extra cost is not required for the new Tools and Technologies.

Next when it comes to Software's and Hardware's, all the Software's used for the Development of the System are of Open Sources i.e. freely available over the Internet and Hardware's are nothing but the Computer and an Internet Connection, and these too are present in the Organisation, so no extra cost is required.

Next is regarding the Staff or People for development, the Existing Employees can only handle this project along with Other Projects and there is no need to hire other Staff separately for the Development, hence no extra cost is required in this too.

But once the Project has been developed and has been deployed on the Internet for all the Customers to Use, then the Cost has to be spent as to maintain the Servers, but still the Cost which incurs are less when compared to the Benefits it will Serve for the Organization.

So based on all these research the Proposed System is Economically Feasible for the Development.

d. BEHAVIORAL FEASIBILITY

Here the system is evaluated for its Behaviour and detailed study is done on the Behavioural aspects of the System. Sufficient Support is provided for the Users from the Introduction of the System as it provides a platform for the Users to carry out their respective functionalities regarding the Submarine Cable Management System.

And the system does not cause any kind of harm to the Organisation or to the Users intentionally, suppose due to some malfunction or some unexpected problems the Data loss can happen or some problem related to the Users Accounts can happen as only the Basic level Security is given for them Unlike Bank Accounts, but these problems if they occur also will not do serious Damage as precautions are taken up to minimize the effects on the System and Alternate ways are developed too, for Situations like these. Hence project is behaviourally feasible.

2.3 TOOLS AND TECHNOLOGIES USED

a) TOOLS USED TO DEVELOP THIS APPLICATION

i. IDE: Eclipse

Eclipse is an IDE (integrated development environment), used in the Computer programming. All most all java applications are developed using the Eclipse IDE. It is developed fully in java and the environment which it uses is Eclipse java development tools for java. Eclipse is open-source software i.e. it is freely available on the internet.

In our project we use this to test the code for its functions by running it locally on the tomcat server.

ii. SERVER: Apache Tomcat

Apache Tomcat is simply referred to as Tomcat, is an open-source web server available freely on the internet. Apache Software Foundation (ASF) developed this tomcat server. It is implemented using several java technologies so it provides a web server which is pure java oriented and java codes can be run easily on it.

In our Project we use it to deploy the code on the local host for testing purpose.

iii. IDE: Oracle SQL Developer (Back End)

Oracle SQL Developer is developed by the Oracle Corporation and it is an IDE (integrated development environment) to work on the SQL databases. This product is available freely in the internet and uses JDK (Java Development Kit) for the functioning.

In our project we use this IDE to create and maintain the database efficiently.

b) TECHNOLOGIES USED TO DEVELOP THIS APPLICATION

i. Struts Version 1.0

Struts is a Framework used to develop Java Applications.

ii. Java Version 7.0

Java is a programming language which uses Object Oriented approach, it is an open source and all most all Software's now are developed using it as it is an open-source.

iii. Oracle 10g

Oracle 10g is the most cost effective Database available in the market today and it provides very efficient way to handle the Data.

iv. Web Technologies Used

1. HTML

Hypertext Mark-up Language is commonly abbreviated as HTML, it is used to create Web Pages and it is used to create User Interfaces for web applications and mobiles.

2. CSS

Cascading Style Sheets is commonly abbreviated as CSS. It is used for designing purpose in the Web technologies.

3. JavaScript

JavaScript is the programming language of HTML and the Web. It is an interpreted programming language. It is designed for network centric applications.

4. JQuery

JQuery is a cross-platform JavaScript library is designed to handle the scripting of HTML in client side. JQuery is the most popular JavaScript library in use today.

5. Ajax

Ajax also known as Asynchronous JavaScript and XML is a client side web technology used to create asynchronous web applications.

2.4 HARDWARE AND SOFTWARE REQUIREMENTS
2.4.1 HARDWARE REQUIREMENTS

Processor : Intel 3.0 GHz or Higher Processor

Hard Disk : 20 GB (min)

RAM : 1 GB (min)

2.4.2 SOFTWARE REQUIREMENTS

Operating System: Windows XP/Vista/7

JDK : 1.5/1.6 and above

Front End : JAVA, JSP (Java Server Pages)

Back End : Oracle 10g

Framework : Struts 1.0

3. SOFTWARE REQUIREMENTS SPECIFICATION

Software Requirement Specification (SRS) is a description of all the requirements that the software system should possess after the development.

3.1 USERS

Users are the people who interact with the system directly or who use the system to carry out their required functionalities, in our proposed system Users are categorized into two types Administrators and Normal users and they will use the system according to their requirements. Admin's and Users are classified into two types as Network Administrator, Super User and Operations User, Capacity Users. All the users use the Web Portal only, but the functionalities that each user can access will be limited based on their user roles.

3.1.1 Administrators

Administrator is a User who has access to all the functionalities of the Portal. They are classified into two types of Users namely,

3.1.1.1 Network Administrators

Network Administrator has access to all the functionalities of the Portal, he/she can perform User Management has adding, modifying and deleting the users to the Portal. He/she will control all the Ticketing Operations such as raising Trouble Tickets or requesting for new Circuits, they can also add Blog's and Projects to the Portal and they provide User Guide as Guidelines for other new Users to use the Portal.

3.1.1.2 Super User

Super User is all most similar to Network Administrator, he/she will have same functionalities as NA, but his/her access will be limited lightly. Super User can add, modify and delete users but he can only perform User Management to the Country which he/she belongs. Super User will perform all Ticketing Operations as NA, but he/she cannot add Blog's and Projects to the Portal. NA can control all 19 Countries Users, but Super User can only control users of single country.

3.1.2 Normal Users

Users or in other words End Users are the type of users whose functionalities are very limited and they are created and assigned Roles by the Admin's respectively, Users are also categorized into two types namely,

3.1.2.1 Capacity Management Users

Capacity Management Users will have access to limited functionalities in the Portal, he/she will have access to only Ticketing Operations such as Trouble Ticket and requesting for new Circuits and they can also view various reports, Blog's and Projects which are added by the Admin.

FIGURE 2. Account logged in as Network Admin

3.1.2.2 Operations Users

Operations Users will have access to very limited functionalities in the Portal, he/she will have access to only Ticketing Operations such as Trouble Ticket and they can also view various reports, Blog's and Projects which are added by the Admin.

3.2 FUNCTIONAL REQUIREMENTS

All the requirements that are to be carried out by the system directly are known as Functional Requirements, these requirements denote the fundamental actions of the system.

The requirements are classified based on the User roles and are explained below, as what type of user needs what type of functionality,

3.2.1 User Class 1 – Admin's

3.2.1.1 Web based project

Any type of memory requirement is not wanted.

Web browsers must have to be installed in the Computers such as Internet Explorer, Chrome etc. Basic computer knowledge and skills are required to use this product.

3.2.1.2 Prompt for Login Credentials

The System shall prompt the User for User id and Password to access the Portal.

The System shall authenticate User Credentials to login into ones Account.

3.2.1.3 Provides User Management

The System shall provide functions for Admin to create new Users under him.

The System shall provide the Approving mechanism for the newly created Users.

The System shall provide the Enabling and Disabling mechanism for all the Users created.

The System shall provide the mechanism to reset all the User Passwords.

The System shall provide the mechanism to Search for a specific User.

3.2.1.4 Provides Ticketing Operations for any Kind of Trouble issues in Submarine Cable (AAE-1)

The System shall provide the mechanism to raise a Trouble Ticket for any kind of trouble in the Submarine Cable System.

The System shall provide the mechanism to raise a Change Ticket for any kind of change that has to be done in the Current Submarine Cable System.

The System shall provide the mechanism to Search and modify the raised Tickets.

3.2.1.5Provides Ticketing Operations for Circuit Requests and Responses

The System shall provide a mechanism to raise a Ticket to make a new Circuit Requests.

The System shall provide a mechanism to approve the newly made Circuit Requests.

The System shall provide a mechanism to Search the Circuit List.

The System shall provide a mechanism to de-activate the existing Circuit.

3.2.1.6 Provides platform to create blogs
The System shall provide the mechanism for creating Blogs. The System shall provide the mechanism to modify the Blogs.

3.2.1.7 Provides platform to create projects
The System shall provide the mechanism for creating Projects.

The System shall provide the mechanism to modify the Projects.

3.2.1.7 Provides Reports
The System shall provide the mechanism for displaying various kinds of reports regarding the Submarine Cable Management System.

Various types of reports include ticketing operations reports, as how many and what types of tickets have been raised in a particular month and Reports about all the Cable Landing Stations are also provided.

3.2.1.8 Provides Reports
The System shall provide the mechanism for displaying various kinds of reports regarding the Submarine Cable Management System.

Various types of reports include ticketing operations reports, as how many and what types of tickets have been raised in a particular month and Reports about all the Cable Landing Stations are also provided.

3.2.1.9 Online User Documentation
The System shall provide online document, specifying Users as how to use the AAE Portal.

3.2.1.10 Provides Project Status
The System shall provide the Status of the Project for the Users knowledge as what all new Projects have been implemented along with the AAE.

3.2.2   User Class – 2 End Users
3.2.2.1 Prompt for Login Credentials
The System shall prompt the User for User id and Password to access the Portal. The System shall authenticate User Credentials to login into ones Account.

3.2.2.2 Provides Ticketing operations for any Kind of Trouble issues in submarine cable (AAE)

The System shall provide the mechanism to raise a Trouble Ticket for any kind of trouble in the Submarine Cable System. The System shall provide the mechanism to raise a Change Ticket for any kind of change that has to be done in the Current Submarine Cable System.

The System shall provide the mechanism to Search and modify the raised Tickets.

3.2.2.3   Provides Ticketing operations for Circuit Requests and Responses

The System shall provide a mechanism to raise a Ticket to make a new Circuit Requests.

The System shall provide a mechanism to approve the newly made Circuit Requests.

The System shall provide a mechanism to Search the Circuit List.
The System shall provide a mechanism to de-activate the existing Circuit.

3.2.2.4 Provides Reports
The System shall provide the mechanism for displaying various kinds of reports regarding the Submarine Cable Management System.

3.2.2.5 Provides User Guide
The System shall provide the User Guide for reference as how to use the Portal for the Users who access the Portal

3.3 NON-FUNCTIONAL REQUIREMENTS

3.3.1   Performance Requirements

The System should run on internet and it has to be run from web server.

Initial loading time of the system depends on the internet connection strength and it also in turn depends on the computer system on which the product is run.

Hardware components of client's computer directly affect the performance of the system.

Messages will be displayed with not less than two seconds once the user submits any information to the system. Maximum 7 seconds is taken to display the responses on the screen to the queries that are submitted by the User.

 The System shall be a web portal which can be accesses by the internet around the World.

The System shall be accessed simultaneously from Users across the 19 different Countries.

3.3.2   Safety Requirements

No Safety requirements have been identified.

3.3.3   Safety Requirements

a) Transfer Data

The System shall prompt the users their respective User id and passwords in order to give access for the functionality of the System.

The System shall maintain confidential customer information by using the secure sockets in all transactions. Users have to be logged out after a certain period of inactivity. Any cookies containing user passwords has not to be left on the customer's computer. Any cookies containing users personal information has not to be left on the customer's computer.

b) Data Storage

Web browser of customers should never display the customer's password and it should be displayed in special characters only always. Servers should not display the customer's password ever and passwords can only be reset but never be displayed. Authenticated administrators can only access the System's servers. The System's back-end database shall be encrypted with db5 algorithm.

The System shall not allow users to go back to home page without logging out from their respective accounts.

3.3.4   Software Quality Attributes

All the Web pages must have uniform look and feel for the customers.

Internet availability should 99.9999% always, so the system should make an agreement with Internet Service Provider to provide the internet all the time. If the Connection between the user and the System is broken when a User about to submit in any page, then the operation is cancelled and the User has to carry out the process from the first.

4.   SYSTEM DESIGN

The AAE Web Portal is a System which is used to manage a Submarine Cable (AAE) efficiently, the proposed system will act as an Interface between the End Users and NOC (Network Operations Centre), there are number of functionalities to manage the Submarine Cable in the AAE Web Portal, which includes rising of tickets, requesting for the new Circuits, User Management such as Adding, Deleting and modifying the Users etc.

The functionalities or requests made by the End Users are sent to the NOC (Network Operations Centre) to respond to those or to resolve those; once they are resolved they are updated in the Portal for the End Users.

There are four types of Users, who access this Portal by logging in to it, the Portal functionalities varies accordingly for the different types of Users who has logged in. According to the User and their requirements they will access the Portal functionality; accordingly to the inputs given the System will respond.

The Administrators will have all the functionality of the Portal and the Normal Users will have only selected or limited functionality.
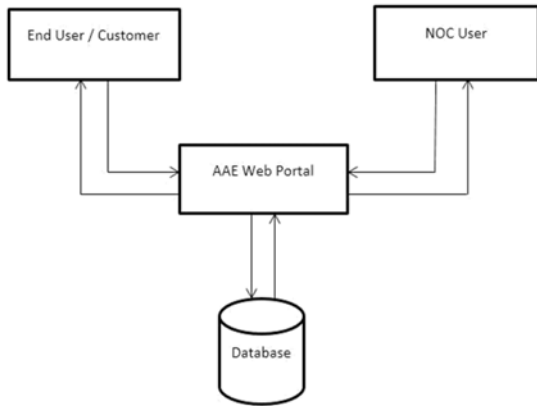
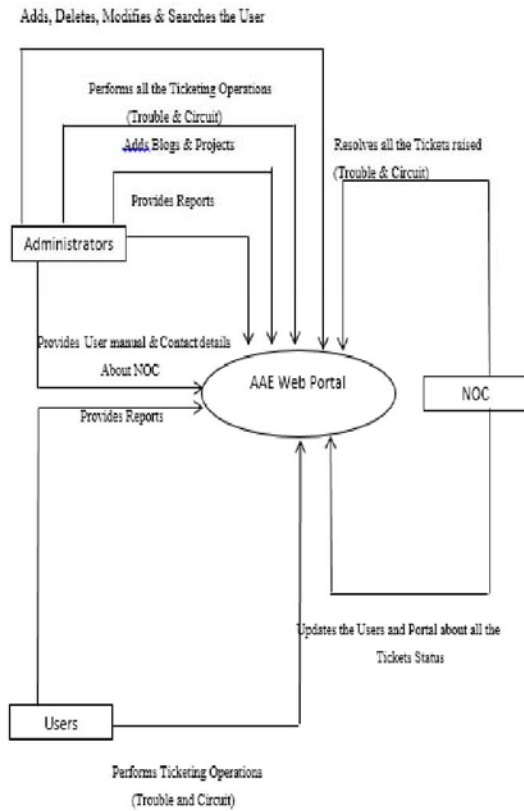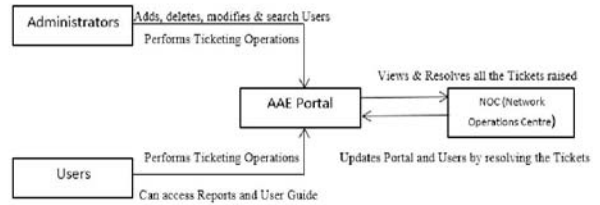Fig 1 – Architecture of the Proposed System (AAE Web Portal)

4.2 CONTEXT DIAGRAM
i.   **Level 0 (Context Level)**

ii.   Level 1

4.1 SYSTEM PERSPECTIVE

iii.   **Level 2**

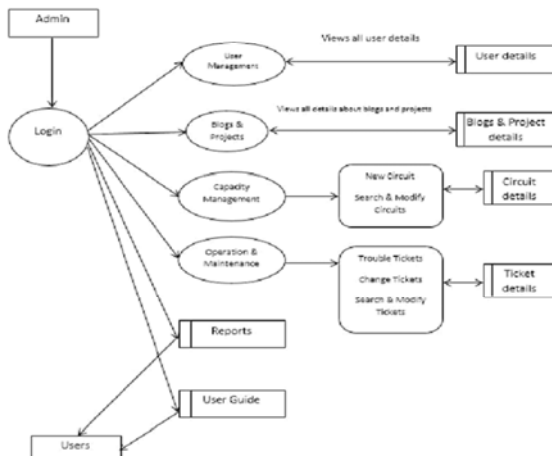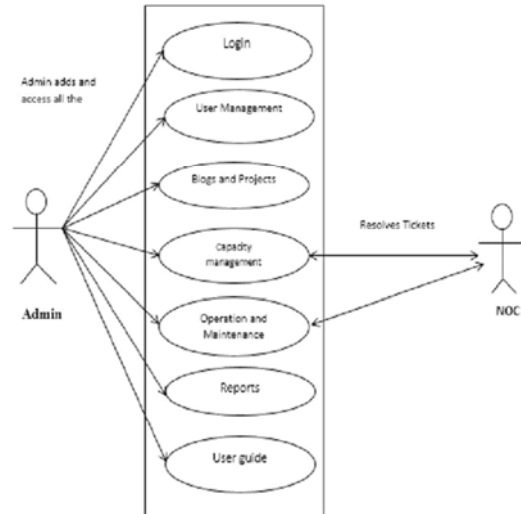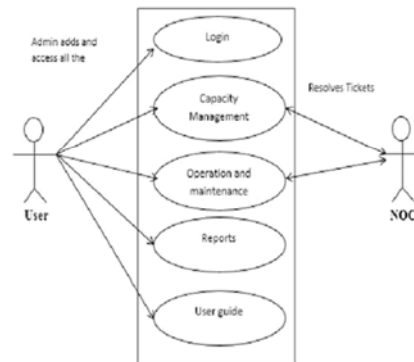Fig 2 - Overall system functionality is depicted in the above figure
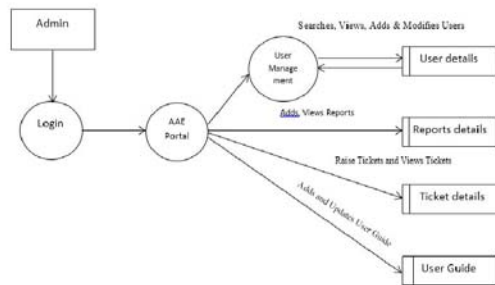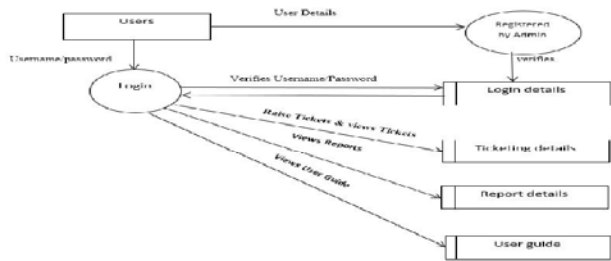
iv. Level 3

i. Scenario for Admin

v. Level 4

ii. Scenario for User

In the above Context diagram functionalities of Admin is specified and what all user can access which admin has created.

5. CHALLENGES AND OPEN ISSUES

As there are many technology improvements taking place, the frame work used here i.e, struts1.0 is not very efficient compared to spring which is most used today. So the portal must be upgraded with current technologies so work efficiently.

This section briefly presents both explored and unexplored issues surrounding AAE-1.

Disadvantage of Struts1.0 are:
1.   Need more Learning:- Struts1.0 is not for small project

.As Struts1.0 need more learning any developer cannot work on struts2 directly. Before work on struts1.0 developers must have knowledge of Core Java, JSP, Servlets, HTML, Custom JSP Tags, Tags library and also Struts2 need more clear knowledge of Struts1.0 frameworks also like is follow, working of different Action classes, way of configuring XML file and plug-in etc

.That mean any developer must need expertise before work on Struts2 application .but This is not an issue with experienced developers.

2. Not More Documentation:- As Compare Servlet, JSP struts1.3 have no more online free help materials. Only Apache has provided some help which is not sufficient and has note covers sufficient examples. So developer needs more works on study.

6. Less Transparent In a Struts applications:- In Struts1.0 there is a so many things are going on behind the scenes than with normal Java-based Web applications.

As a result, Struts1.0 applications are: not easy to understand and not easy to benchmark and optimize.

7. Disadvantage Imposing: - You want to use Struts then you will have to just follow the rules set by this framework.

8. Disadvantage Performance:-This frameworks bigger call stacks due to various function calls which results in lesser performance.

6. CONCLUSION

Commissioning of the intercontinental superhighway cable, which will employ 100Gbps transmission technology and a minimum design capacity of 40Tbps. AAE-1 will be 25,000km long and bring 19 operators together along the low latency Eurasian express route.

AAE-1 will connect Hong Kong, Vietnam, Cambodia, Malaysia, Singapore, Thailand, Myanmar, India, Pakistan, Oman, UAE, Qatar, Yemen, Djibouti, Saudi Arabia, Egypt, Greece, Italy and France. It has two diversified points of presence (PoPs) in Asia (terminating in Hong Kong and Singapore at carrier neutral data centres) and three onward connectivity options in Europe via Greece, Italy and France (terminating in two Marseille carrier neutral data centres).

7. REFERENCES

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