IITB Summer Internship 2014

Project Report
Aakash Tech Support Web-Application

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Project Approval Certificate

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The project entitled "**Aakash Tech Support Portal**" submitted by Mr. Anurag Baidyanath, Ms. Kavleen Kalra, Mr. Shaswat Sunder Nayak, Mr. Shubham Utwal and Mr. Som Pathak is approved for Summer Internship 2014 programme from 9th May 2014 to 6th July 2014, at Department of Computer Science and Engineering, IIT Bombay.

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Place: IIT Bombay, Mumbai

Date: July 02, 2014

Declaration

       I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/ fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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ONE

ACKNOWLEDGEMENT

We the summer interns team of Aakash Portal are overwhelmed in all humbleness and gratefulness to acknowledge our depth to all those who have helped us to put our ideas and assigned work, well above the level of simplicity and into something concrete.

We all thank whole heartedly Prof. Deepak Phatak for selecting us a part of his valuable project, constantly motivating for doing better and showing complete confidence in our work.

We are indebted to our Project Manager Mr. Parag Tiwari for his constant help and support in light of this project.We is very thankful to our mentors Tushar Sharma for his valuable suggestions, guidance and encouragement. Also in the process, we learnt a lot other technical and non technical things from them.

Finally we also like to thank all other colleagues working in different projects under Prof. Phatak for helping us at small problems as well as critical junctures.

TWO

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ABSTRACT

The Aakash Tech Support Portal is a online Portal, which is divided into two modules, Discussion forum and Ticketing system.

Discussion forums Provides Aakash tablet users a platform to discuss the technical Problem that they face with the tablet with each other. Discussion Forum, FAQ and submit ticket features are provided to the users to help him solve the problem.

The Discussion forum is an online platform which brings users together and facilitates community engagement and helps them to solve any issues related to their Aakash tablets. Users can view and help in existing questions or post new ideas and discuss on them. In case the discussion forums are unable to solve their problems they can submit a ticket and get their issue resolved.

Aakash Tech Support Portal is Open Source software. Therefore it is going to be freely available. It is Platform Independent, easy to operate and maintain.

LIST OF DIAGRAMS

A list of diagrams.

- Use case diagram of the Ticketing System

- Use case diagram of the Login and Registration system

- Use case diagram for Discussion Forum

- Data flow diagram for Aakash Tech Support Portal

- Flow chart for Reporting a problem

- ER diagram for Database

FIVE

INTRODUCTION

Enhancements to Aakash Tech Support Portal is a MHRD Project developed by summer interns at IITB under the guidance of *Prof. Deepak Phatak*. Aakash Tech support Portal is a place where one can share ideas, discuss issues and effectively collaborate with one another towards solving problems associated with the Aakash tablet. In case the user cannot find his answers on discussion forums he can submit a ticket for the admin to answer his query.

5.1 Documentation Purpose

The purpose of this document is to present a detailed description of *Aakash Tech Support System*. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for both the stakeholders and the developers of the system .The features discussed in this document are mainly functional requirements. These requirements are described in software development perspective to easily grasp by use. It also covers the non-functional requirements like performance, reliability, availability, security and maintainability.

5.2 Project Scope

With the continued evolution in technology, portal is becoming more and more essential now-a-days, where user can freely express their thoughts, ideas and discuss their issues that they are currently facing with the technologies and products they use.Aakash tech support portal provides a convenient and easy-to-use graphical user interface for the users.

The Aakash Tech Support portal is divided into two modules:

- *Discussion Forums*: Aakash Tech support portal's Discussion forums provides a platform where Aakash tablet users can share and clarify their issues which they are facing with Aakash tablet.

- *Ticketing system*: The ticketing system enables user to submit tickets related to his issues in case he cannot find his answers on discussion forums. It also enables the admin to answer users query and view statistics related to ticket traffic and category wise breakup of tickets.

Aakash Tech Support Portal is an Open Source software i.e. Aakash Tablet user can utilize the resources available on portal without any cost. Therefore it is going to be freely available. It is Platform- Independent and easy to operate and maintain.

5.3 Intended Audience and Document Overview

This document will be the first guide for prospective software developers, project managers, testers and most importantly users of Aakash tablet. This document contains software functionality, software and hardware requirements and user documentation.

- *Developer*: The developer who wants to read, change, modify or add new requirements into the existing program may need first to consult this document and update the requirements in appropriate manner so as not to change the actual purpose of the system or make the system inconsistent.

- *User*: The user of this program reviews the diagram and the specification provided in the document and check to determine whether the software has all the suitable requirements and if the software developer has the implemented all of them. He can also consult the user guide in the event of any confusion for clarifications.

- *Tester*: The tester needs this document to prepare his test cases to validate that the initial requirements of this project is actually implemented in the deliverables.

5.4 Definitions, Acronyms and Abbreviations

- Python:

It's a very-high-level dynamic object-oriented programming language.It's designed to be easy to learn, read and program. Python is a general purpose language, which means that many things are made easy like string processing, reading/writing files, sockets, websites, databases, GUI's. Also it's dynamic i.e. new code can be executed during runtime without limitations.

- Django:

It's a high-level Python Web framework that encourages rapid development and clean, pragmatic design.Django follows the model–view-controller architectural pattern.

- HTML5:

HTML5 is a core technology markup language of the Internet used for structuring and presenting content for the World Wide Web. It is the fifth revision of the HTML standard. It's core aims have been to improve the language with support for the latest multimedia while keeping it easily readable by humans and consistently understood by computers and devices (web browsers, parsers, etc.). HTML5 is intended to subsume not only HTML 4, but also XHTML 1 and DOM Level 2 HTML.

- GIT:

Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.Git allows groups of people to work

on the same documents (often code) at the same time, and without stepping on each other's toes.

5.5 Document Conventions

In general this document prioritizes in writing the requirements of the system and analyzing in details the tools being provided to its users. Every requirement is having its own priority (none conflicting). In addition few figures are also being provided to make requirements more clearly to the reader.

5.6 References

- https://docs.djangoproject.com/en/1.6/
- http://www.tangowithdjango.com/book/
- http://www.swaroopch.com/notes/python/
- http://stackoverflow.com/
- https://github.com/
- http://getbootstrap.com/
- http://www.sthurlow.com/python/
- http://http://www.w3schools.com/
- http://www.djangobook.com/en/2.0/chapter01.html
- http://lethain.com/tags/django/

SOFTWARE DEVELOPMENT LIFE CYCLE MODEL

Software Development Life Cycle Model adopted for this project is the evolutionary model.
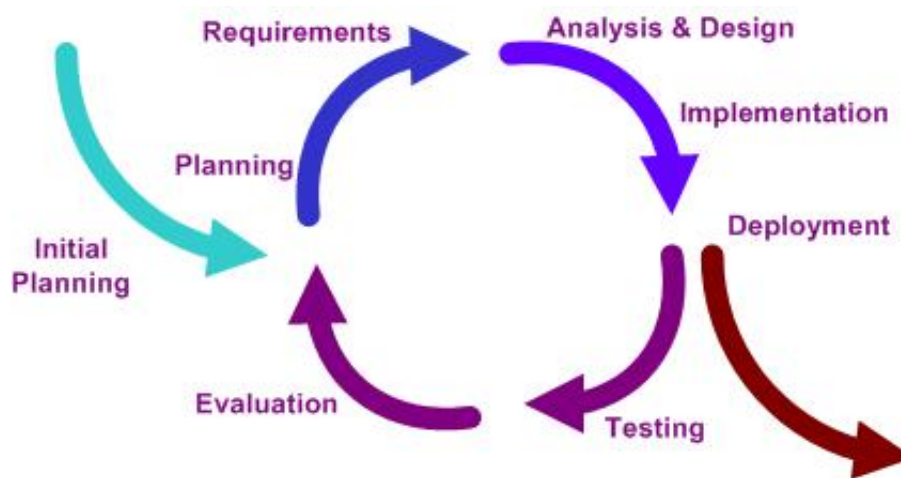
- System Initiation/Planning: Feasible systems replace or supplement existing information processing mechanisms whether they were previously automated, manual, or informal.

- Requirement Analysis and Specification:Identifies the problems a new software system is suppose to solve, its operational capabilities, its desired performance characteristics, and the resource infrastructure needed to support system operation and maintenance.

- Functional Specification or Prototyping: Identifies and potentially formalizes the objects of computation, their attributes and relati onships, the operations that transform these objects, the constraints that restrict system behavior, and so forth.

- Partition and Selection (Build vs. Buy vs. Reuse): given requirements and functional specifications, divide the system into manage able pieces that denote logical subsystems,then determine whether new, existing, or reusable software systems correspond to the needed pieces.

- Architectural Design and Configuration Specification: Defines the interconnection and resource interfaces between system subs ystems, components, and modules in ways suitable for their detailed design and overall configuration management.

- Detailed Component Design Specification: Defines the procedural methods through which the data resources within the modules of a component are transformed from required inputs into provided outputs.

- Component Implementation and Debugging: Codifies the preceding specifications into operational source code implementations and validates their basic operation.

- Software Integration and Testing: Affirms and sustains the overall integrity of the software system architectural configuration through verifying the consistency and completeness of implemented modules, verifying the resource interfaces and interconnections against their specifications, and validating the performance of the system and subsystems against their requirements.

- Documentation Revision and System Delivery: Packaging and rationalizing recorded system development descriptions into systematic documents and user guides, all in a form suitable for dissemination and system support.

PRODUCT PERSPECTIVE

The product is supposed to be an open source, under the GNU general Public License. It is a web based system implementing client-server model. The Aakash Aakash tech support portal provides simple mechanism for users to share and acquire knowledge and help each other to solve their problems.

The following are the main features that are included in Aakash tech support portal

- Cross platform support: Offers operating support for most of the known and commercial operating systems.

- User account: The system allows the user to create their accounts in the system and provide features of updating and viewing profiles.

- Number of users being supported by the system: Though the number is precisely not mentioned but the system is able to support a large number of online users at a time.

- Search: search is simply local search engine based on key words.

- Discussion Forum: Provides users with a platform to discuss and help each other with their problems

- Ticketing system: Allows user to submit his issue to the admin in case his problems are not solved by FAQs and discussion forums.

- FAQs section: Frequently asked section contain answer of problem which Aakash tablet user frequently faced.

7.1 User Characteristics

It is considered that the user do have the basic knowledge of operating the internet and to have access to it. The administrator is expected to be familiar with the interface of the tech support system.

7.2 Operating Environment

This is a web based system and hence will operate on any modern operating system running a modern browser with HTML5 and javascript support.

7.3 Dependencies

- This software highly depends on type and version of browser installed in the system. A browser version should be used which have HTML5 support for best experience.

7.4 Design and Implementation constraints

This system is provisioned to be built on the Django framework which is highly flexible.Decision regarding which database to use should be taken considering the fact that data being exchanged or stored is large, and the appropriate data management system will yield efficient performance.

EXTERNAL USER REQUIREMENT

8.1 User Interface

8.1.1 Discussion Forum

The Discussion Forum is an online site where people can hold conversations in the form of posted messages.Various kinds of questions are posted are on the forum where other can answer these questions depending upon their knowledge of the topic.

In our Discussion Forum, the users post their questions regarding Aakash Tablet. Other users who are familiar with the problem, can post a reply for the same. Every post and reply needs the approval of admin before it gets published on the Website.

- *Login and Registration Page*

    Here, the new users can register into the Aakash Tech support portal. The user as well as the admin can login into the system.
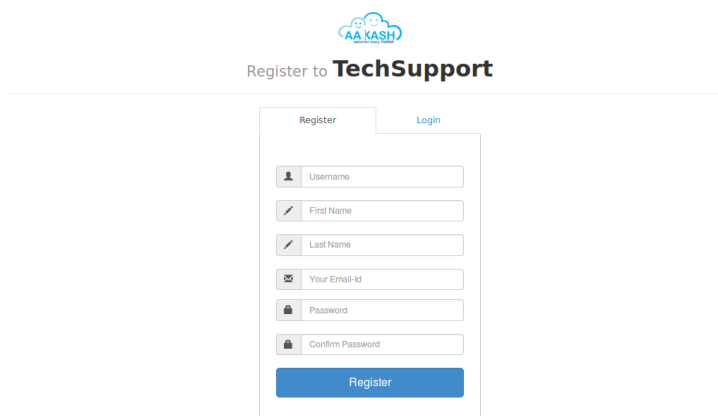
    – Registration page

Figure 8.1: *The Registration page*

    – Login page

Log In to **TechSupport**

Register   Login
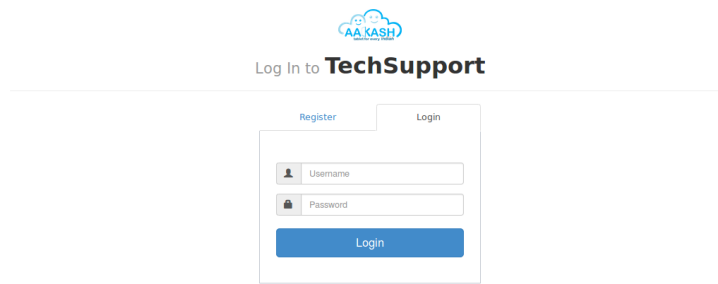
👤 Username

🔒 Password

Login

Figure 8.2: *The login page*

- *User Panel*

    Here, the user can search for questions(issues) related to the Aakash Tablet.
    The Forum is again sub-divided into sections like 'latest', 'frequent', 'votes'
    and 'unanswered'.

    – Latest questions

    Questions are diplayed according to their post date and time, the latest queries
    being on the top.

    – Voted questions

    The most voted queries and replies will appear upfront. Only logged in users
    can vote for their favourite posts.
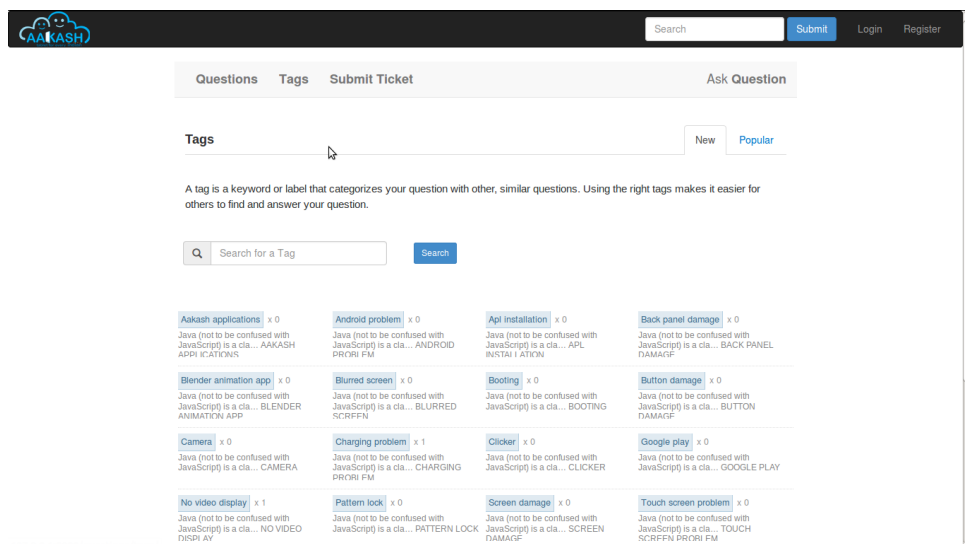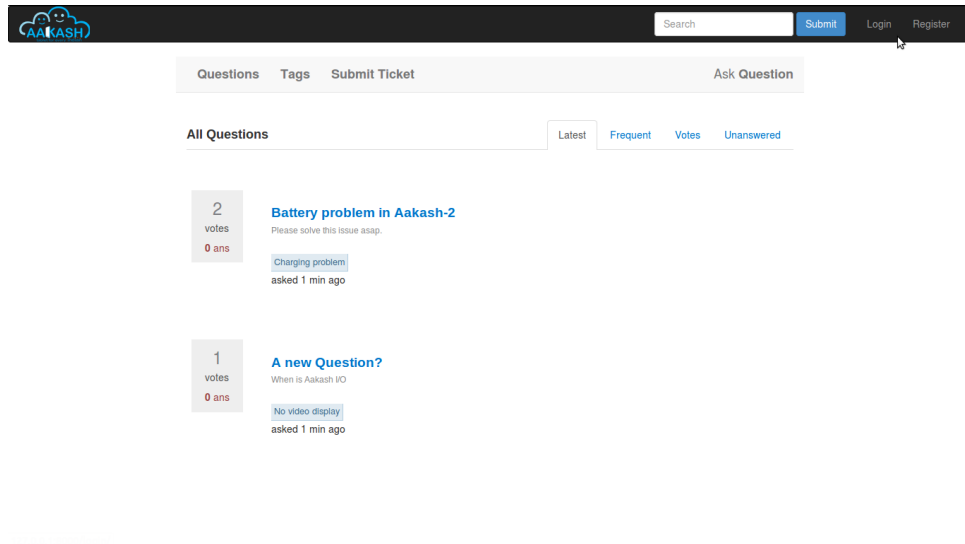
    – Frequently viewed questions

    Questions those are frequently searched or viewed are displayed which makes
    searching easy and simple.

    – Unanswered questions

    Posts without replies are shown. Once answered, they don't show up in this
    section anymore.

    The user can further optimise his search through the 'tags' option. A tag is a
    keyword or label that categorizes your question with other, similar questions.
    This will show questions related to a particular tag(category) as selected by the
    user. Using the right tags makes it easier for others to find and answer your
    question. This include categories like 'Android problem', 'Back panle dam-
    age', 'Booting', 'Camera', 'Charging Problem', 'Wifi Connectivity', 'Touch-
    Screen Problems', etc.

    The tags can also be linked with their respective questions by using the search
    mechanism. The user passes the tag to be searched in a text box which is pro-

cessed in a view called 'tag_search'. In this view the name of the tag is fetched from the html textbox and is checked for its availability in the database. If the tag is present, all posts related to it have been displayed. Posts have been displayed by their creation date and can be sorted by their no of views.

Now, if the user doesn't find the appropriate question he is searching for then he can post his own question using the option 'Ask Question'. But for that, the user needs to login. Only then he is allowed to ask questions.
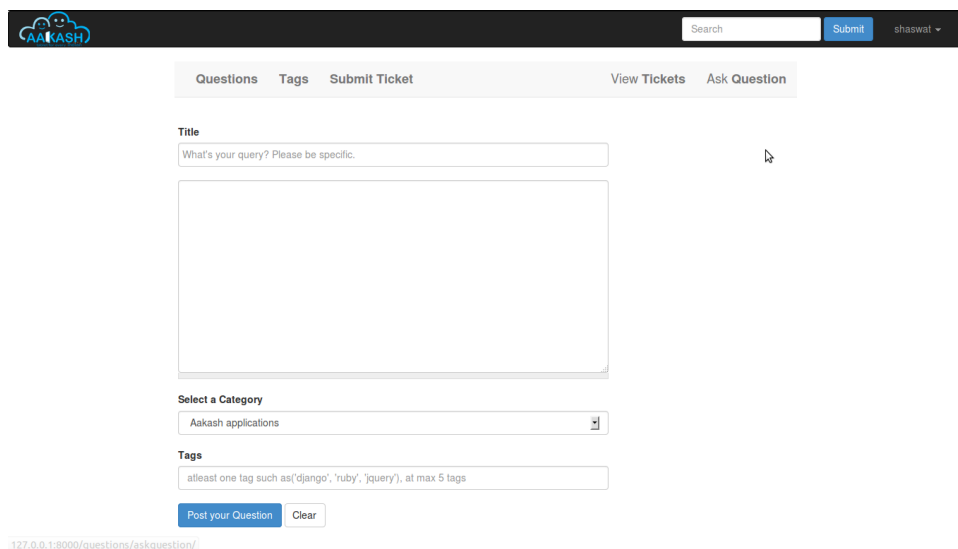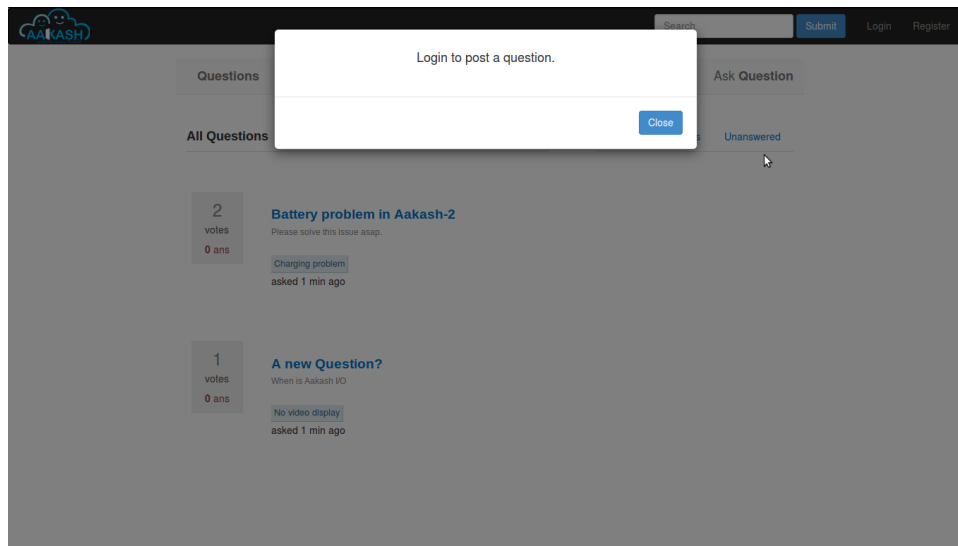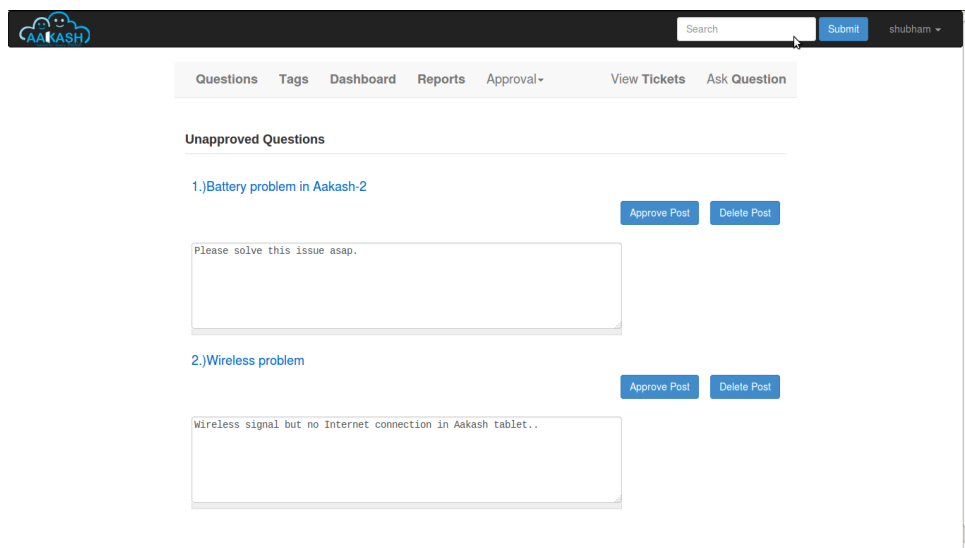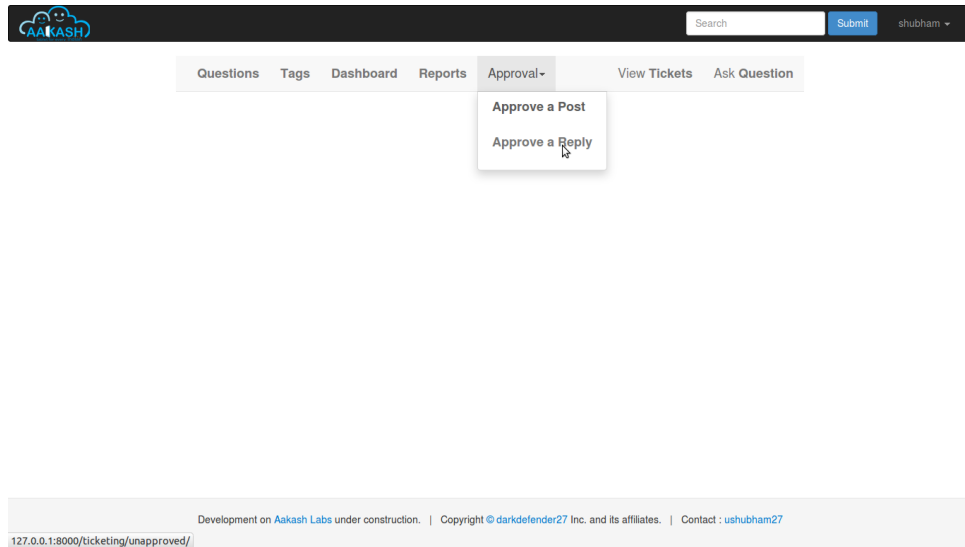

- *Admin Panel*

   The Admin Interface contains a column for Approval of a Post or Reply.

   – Approve a Post

   When the Admin clicks on 'Approve a post' option, he gets all the unapproved posts.He can either approve the post or delete a post. He has also got the option for editing the post, if reqiuired. Whenever a post is approved, a mail is sent

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to the user who posted the issue. On approving or deleting a post, the Admin
is directed to the same page.

– Approve a Reply

When the Admin clicks on 'Approve a Reply' option, he gets all the unap-
proved answers corresponding to the various posts. He can either approve the
reply or delete it. He has also got the option for editing the reply, if reqiured.
Whenever a reply is approved,a mail is sent to the user who posted the issue
so that he can be informed that his question has been answered. On approving
or deleting a reply, the Admin is directed to the same page.
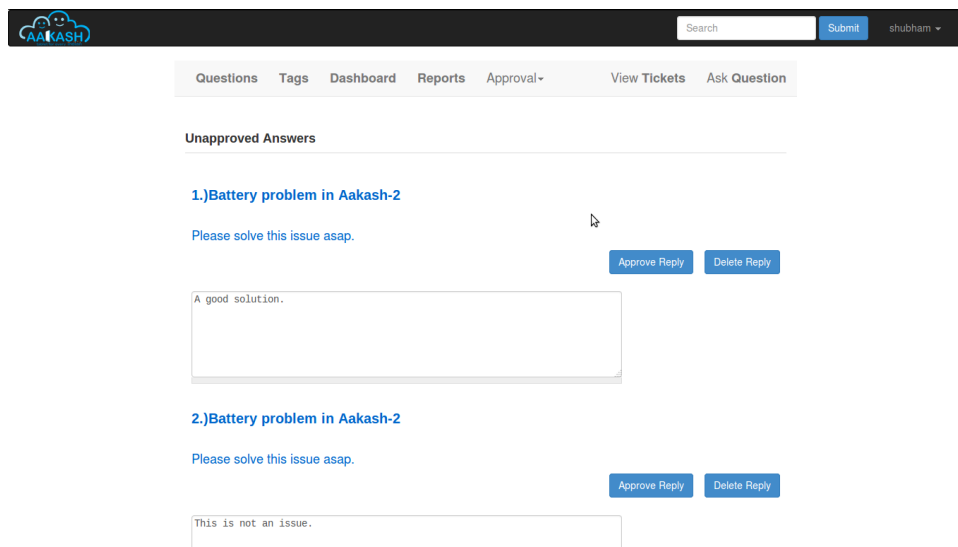
8.1.2 Ticketing system

The ticket submission system allows the user to submit his issues for resolution by the tech
support officials in case the FAQs and discussion forum do not provide enough information.

The user is able to go to the submit ticket page by clicking on the link to the same on the home
page; provided he is logged in.A user is allowed to submit a ticket only if he is logged in. If a
user tries to submit a ticket without being logged in; he is redirected to the login page.Once the
user has been logged in and is on the submit ticket page; in order for him to submit his issue he
has to provide the following details:

- Tablet id: The tablet id is an eight digit number inscribed on the back of every aakash
  tablet.

- Message: The details of the problem that the user is facing goes here.

- Category of the problem: The user is given a drop down list of categories to select from.

- Email : The email field is automatically populated with the email id of the logged in user.

Once the user has submitted his details, the tablet id is validated to see that its genuine; follow-
ing which the user is taken to a page where his unique ticket id is displayed. The user can quote
this ticket id later to refer to the problem in future.

Figure 8.3: *Submit ticket page*

A screenshot of the page showing the ticket number so generated is shown below:

Figure 8.4: *Page displaying ticket id after the ticket is submitted*

- The view tickets feature for the user to view the details of all the tickets submitted by him

The user can view the details of all the tickets submitted by him; provided he is logged in.

The details displayed include the ticket id, the status of the ticket (whether open or closed), the created date and time of the ticket, the priority of the ticket, the tablet id of the user, the message submitted by the user and the reply posted by the admin The link for the user to view his submitted tickets' details is present on the page displayed to the user once he logs in. If the user is not logged in; he is not shown the link to view the submitted tickets.

The user can close the ticket once he is satisfied with the reply by clicking on the close ticket option.

The following screenshot shows the page containing the ticket details of the user; when he clicks on the view tickets link:
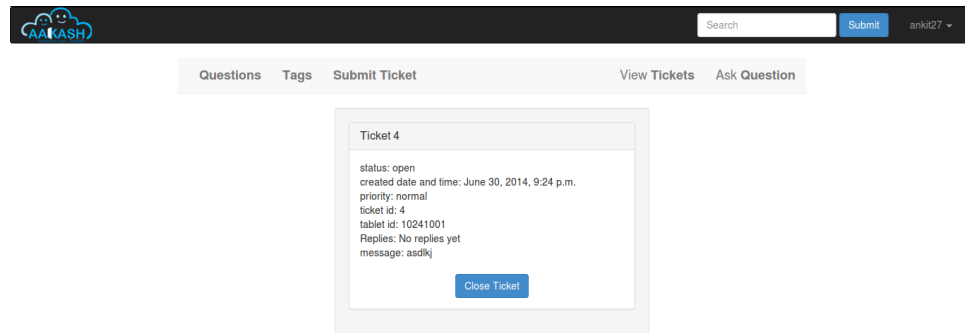
Figure 8.5: *Page containing the ticket details of the user*

- The chart/graph display system on the admin dashboard

The admin can conveniently visualize the statistics about the tickets generated and resolved by using interactive charts and graphs. Three different graphs/charts have been implemented:

- A pie chart showing the Category-wise breakup of tickets.
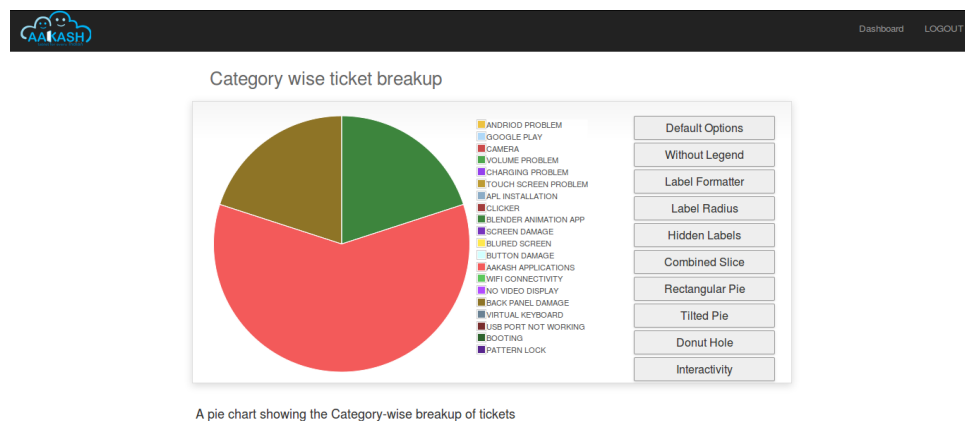
- A pie chart showing the number of open vs number of closed tickets.

- A bar chart showing the number of tickets generated per month.

A pie chart showing the number of open vs number of closed tickets

The above bar chart shows the number of tickets generated per month
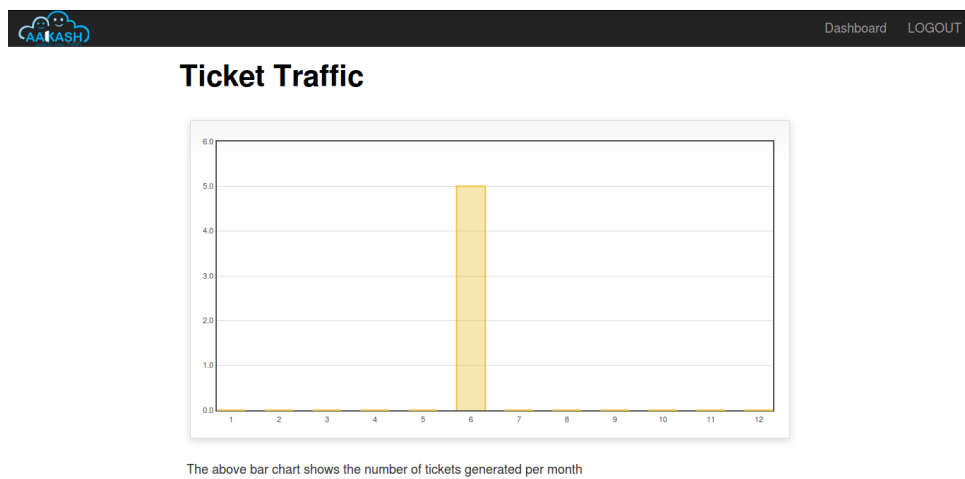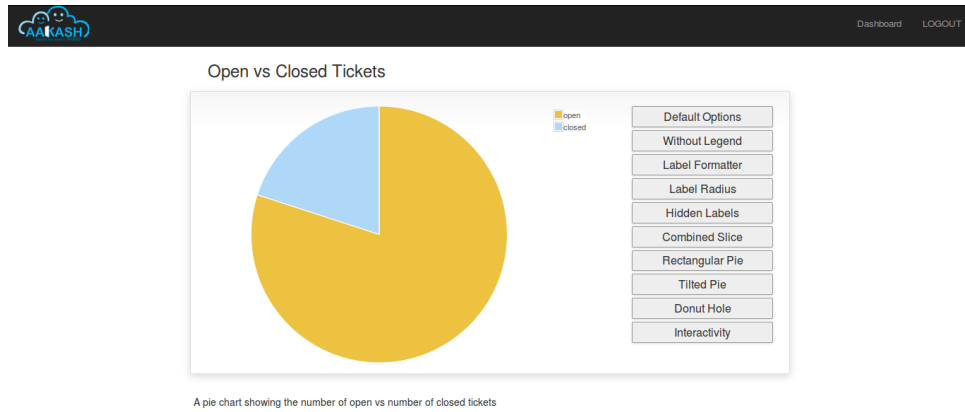
The pie charts are interactive and can be rendered in different ways as desired by the admin; by clicking on the buttons along the right margin.

- The admin dashboard

The admin dashboard system allows the admin to check the submitted issues by aakash tablet id holders in case the FAQs and discussion forum do not provide enough information.To access the admin panel the admin should be logged in with his corresponding id and password.The main page of the admin dashboard shows all the tickets submitted by the user and the category of the problem.

A screenshot of the page showing the ticket number so generated is shown below:
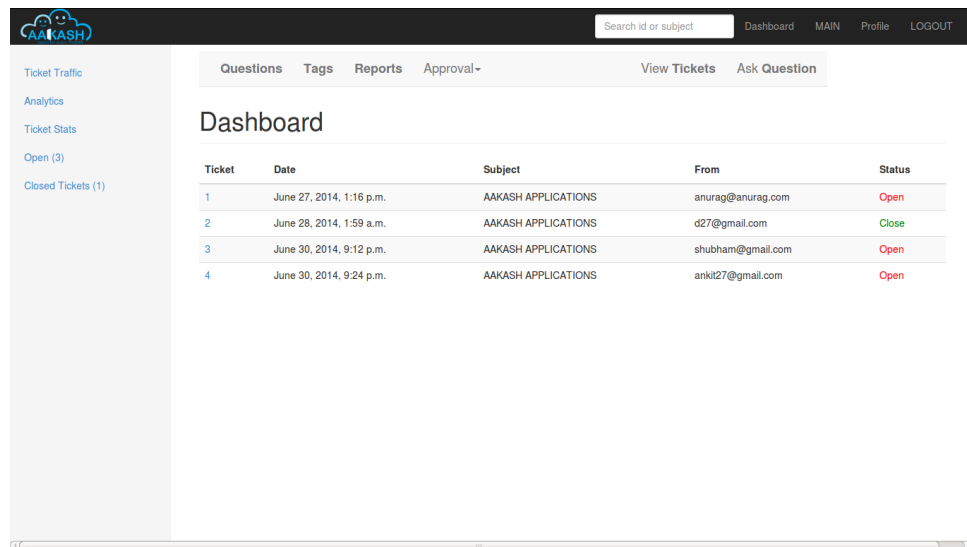
- The Reply interface between user and admin

Reply interface allows admin to reply the query of a specific ticket by clicking on it's Ticket id. screenshot of the page showing the reply interface for a particular ticket number is shown below:
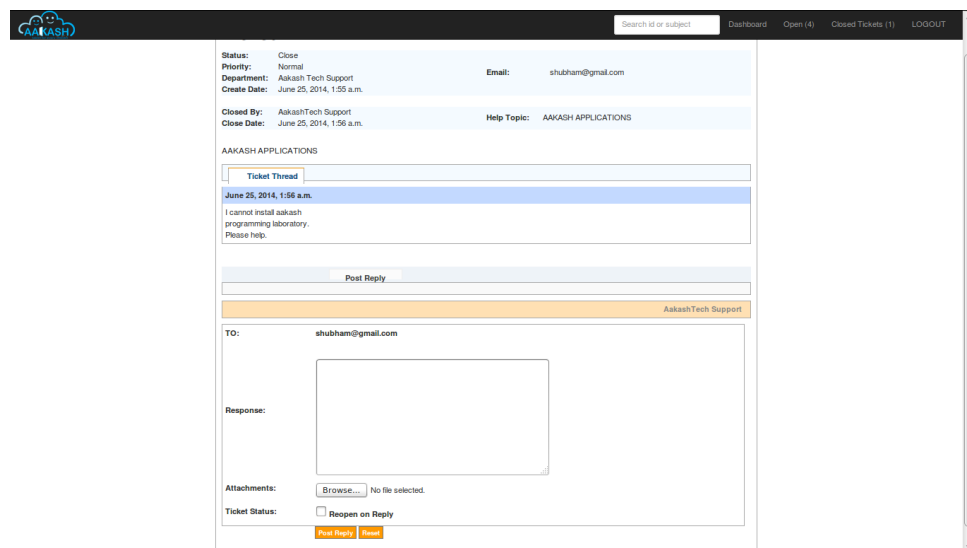
The above Page show the all Details of a particular ticket along with the problem message

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submitted by the user. The admin can reply correspondingly to the problem in the response section and by clicking Post Reply to send a e-mail to the user. The top of the page also shows the statistics of open and close tickets

8.2 Hardware Interface

Device should be Internet enabled.

8.3 Software interface

The user's browser should be HTML5 compatible for a satisfactory user experience.

8.4 Communication Interface

Setting up the server into server mode requires that there will be open ports for accepting connections from the clients. The connection between the client and the server uses Connection oriented communication, via TCP/IP—Transfer Control Protocol/Internet Protocol, implements reliable delivery of messages. Connection-oriented communication makes programming easier because the protocol includes mechanisms for detecting and handling errors and an acknowledgment mechanism between client and service.

FUNCTIONAL REQUIREMENTS

9.1 Major functions of the Discussion Forums

- Enable a user to view questions and their corresponding answers.

- Enable a logged in user to ask questions.

- Enable a logged in user to post answers.

- Enable a logged in user to upvote and downvote answers.

- Provide an interface for the admin to approve posts so that posts are not visible without admin approval

- Enable the admin to generate reports which contains all the posts and their corresponding replies

9.2 Major functions of the Login and Registration System

- Authenticate and Login user to the webapp.

- Enable new users to register to the tech support system.

- Enable a registered user to change his password if he forgets his password.

- Enable a registered user to update his profile which includes his location, skills and profile picture.

- Enable a registered user to view his profile. Additional information viz. questions asked by him and answers posted by him are also displayed.

9.3 Major functions of the Ticketing System

- Enable a registered user to submit a ticket, which contains a detailed explanation to his problem.

- Enable a registered user to view his submitted tickets.

- Enable a registered user to close a ticket submitted by him.

- Enable the admin to view open and closed tickets.

- Enable the admin to post a reply to a submitted ticket.

- Enable the admin to view ticket statistics viz. open and closed tickets breakup, ticket traffic, category-wise breakup of tickets.

- Enable the admin to generate reports which contains details of all the tickets submitted so far.The admin can also select which particular details he wants through an interface.

9.4 FAQs (frequently asked questions)

In this section, solution of General problem that user currently facing in Aakash Tablet is provided.FAQ Contains solutions to general problems. Both Logged in user and Guest can see the Solution.

Here Problem is divided into 3 sections they are:

- Hardware Problem: Contains solution of Hardware Related Problem.

- Software Problem: Contains solution of Software related problem.

- General Problem: Here solution of General Problem is provided.

If user is not satisfied with the solution provided, Logged-in user can submit a ticket to get his problem solved.

TEN

BEHAVIORAL REQUIREMENTS

Behavioural requirements of the system are described using use case view. The Following use case diagrams summarize the functional and behavioural requirements of the Aakash Portal.

- Use case diagram of the Ticketing System
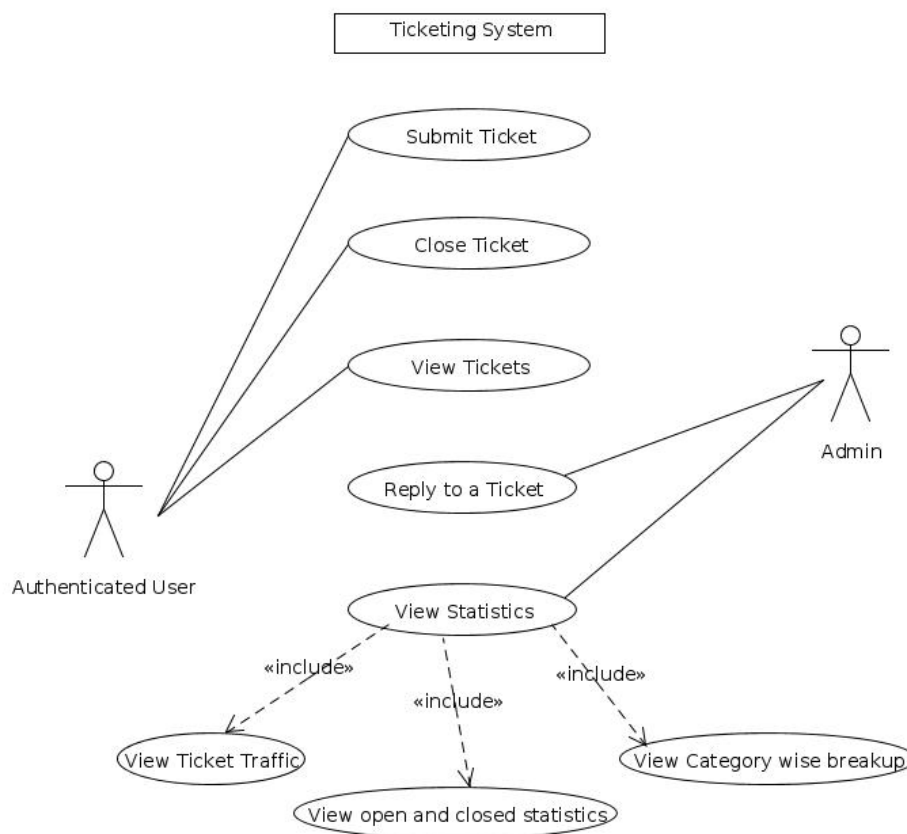
- Use case diagram of the Login and Registration system
- Use case diagram for Discussion Forum

Login & Registration System

Register to the system

Login to the system

Authenticated user

Admin

Profile

«include»

«include»

Edit Profile

View Profile

Discussion Forum

Add a Post

«include»

«include»

Add an answer

Ask a Question

Authenticated user

Vote a Post

Edit a Post

Unauthenticated user

Search Post

View Forum

Admin

Approve a Post
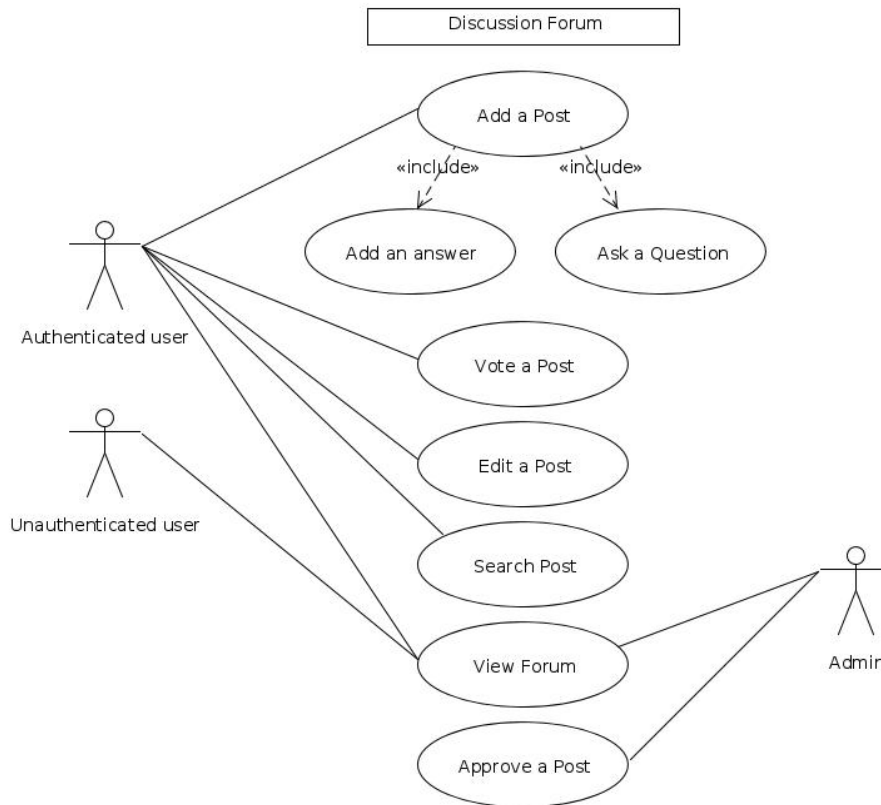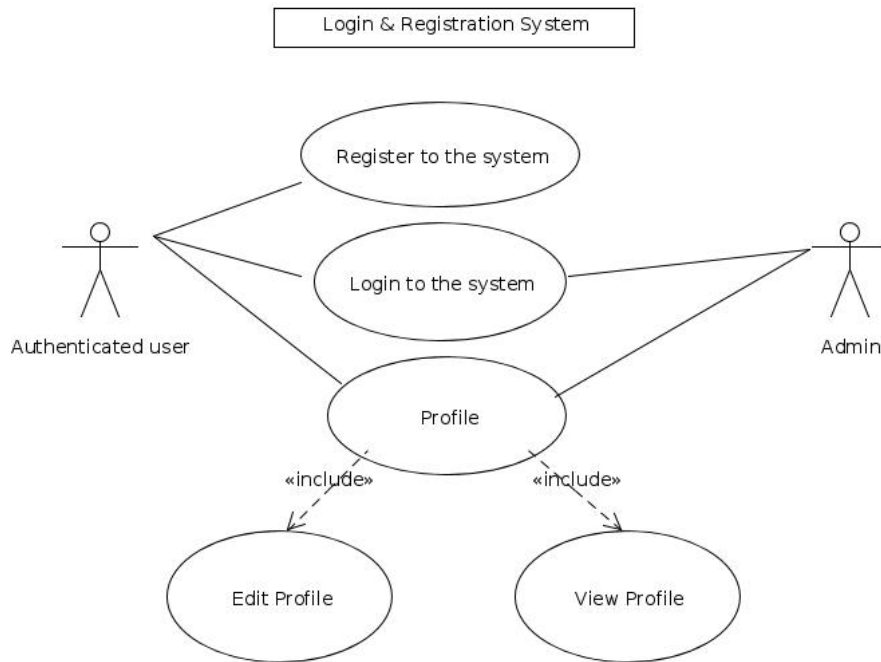
NON FUNCTIONAL REQUIREMENTS

11.1 Performance Requirements

- Performance

The system must be interactive and the delays involved must be less .So in every action-response of the system, there are no immediate delays. In case of opening windows forms, of popping error messages and saving the settings or sessions there is delay much below 2 seconds, In case of opening databases, sorting questions and evaluation there are no delays and the operation is performed in less than 2 seconds for opening ,sorting, computing, posting > 95% of the files. Also when connecting to the server the delay is based editing on the distance of the 2 systems and the configuration between them so there is high probability that there will be or not a successful connection in less than 20 seconds for sake of good communication.

- Safety

Information transmission should be securely transmitted to server without any changes in information

- Reliability

As the system provide the right tools for discussion, problem solving it must be made sure that the system is reliable in its operations and for securing the sensitive details.

11.2 Software Quality Attributes

- Availability

If the internet service gets disrupted while sending information to the server, the information can be send again for verification.

- Security

The main security concern is for users account hence proper login mechanism should be used to avoid hacking. The tablet id registration is way to spam check for increasing the security. Hence, security is provided from unwanted use of recognition software.

- Usability

As the system is easy to handle and navigates in the most expected way with no delays. In that case the system program reacts accordingly and transverses quickly between its states.

DIAGRAMMATIC DESCRIPTIONS

12.1 Data Flow Diagram for Aakash Tech Support Portal

- DFD for Aakash Tech Support Portal
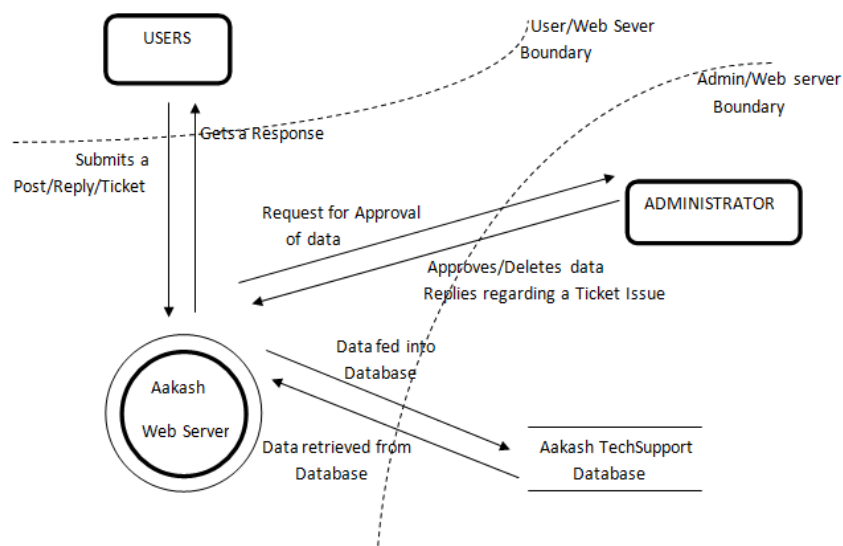
12.2 Sequence Diagrams

- Sequence diagram for discussion forums
- Sequence diagram for ticketing system

12.3 Flow Chart for Reporting a Problem

Flow Chart for Reporting a Problem

USER

Aakash TechSupport
Web Server

Administrator

1) Searches for his problem in the
   discussion forum.

2) Gets a solution to his problem if
   available.

3) If solution is not available, he can
   post a question in discussion forum.

4) Directed to 'Ask a question' page.

5) The question is fed into the
   database.

6) The question is send to the
   Admin for approval.

7) if appropriate, the admin
   Approves the post for display on
   Website.

8)Other users can reply to the given
   Post.

9) The replies are sent to the admin
   For approval.

10) If appropriate, the admin
    Approves the reply for display
    On website.

USER

Aakash TechSupport
Web Server

Administrator

1) Searches for his problem in the
   discussion forum.

2) Gets a solution to his problem if
   available.

3) If solution is not available, he can
   Submit a ticket regarding his issue.

4) Directed to report page if tablet id
   is valid.

5) The user enters his issue and a
   ticket is generated for him.

6) The issue associated with the
   ticket is sent to the admin.

7) The admin provides a solution
   for the given issue.

8) The reply is sent to the user via
   Email.

9) If the user finds the reply
   appropriate, he closes the ticket.

12.3. Flow Chart for Reporting a Problem 31

```
                              ┌──────────┐
                              │  Start   │
                              └────┬─────┘
                                   │
                              ┌────▼─────┐
                              │Search for a│
                              │question in │
                              │Discussion  │
                              └────┬─────┘
                                   │
                              ◇ Is
                       yes   question   No    ┌──────────────┐
                    ◄────────  present?  ─────►│ Ask Question │
                    │                          └──────┬───────┘
                    │                                 │
              ◇ Is                                    │
            solution          No                      │
            feasible?  ──────────────────────────►    │
                    │              ◇ Is               │
                    │            answer      No   ┌────────┐
                    │          satisfactory? ────►│ Submit │
                    │                  │          │ Ticket │
                    │                  │          └───┬────┘
                    │                  │              │
                    │              ╱Enter details╲    │
                    │                  │         ┌────────────┐
                    │                  │         │Report problem│
                    │                  │         │  to admin   │
                    │             ◇ whether      └────────────┘
                    │          Yes  Tab id
                    │       ◄──── is registered?
                    │    ╱Enter the╲       │
                    │    ╱ problem ╲       │
                    │        │             │No
                    │    ┌────────┐        │
                    │    │submit to│       │
                    │    │ admin  │        │
                    │    └───┬────┘        │
              Yes           │     ( )──────┘
                    └───────►( )
                              │
                         ┌────▼─────┐
                         │   End    │
                         └──────────┘
```

12.4 Entity relationship diagram
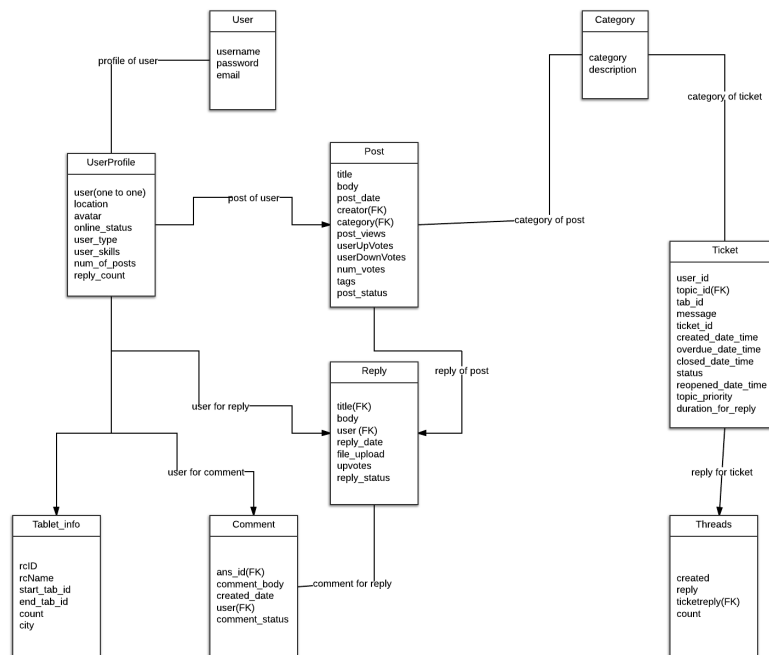
ER Diagram for Database

CONCLUSION

With the continued evolution in technology, portal is becoming more and more essential now-a-days, where user can freely express their thoughts, ideas and discuss their issues that they are currently facing with the technology, this is where Aakash Portal come in picture ,which provided a platform for Aakash users to discuss their issues that they are facing with the Aakash Tablet, as well as Aakash portal create an online platform which brings developers together and facilitates application development and improvement. Aakash Portal also solves the Problem very precisely and dedicatedly for each and every user .The design of this portal is very simple and user-friendly too, which make it more efficiently. Thus we can say that Aakash portal has a great scope in future for the users of Aakash tablet and Developers too.