Tele Education

Software Requirements Specification

Version 2.0

May 1, 2015

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Revision History

Date	Description	Author	Comments
6 April	Version 1.0	Tele Education Group	
11 April	Version 1.1	Tele Education Group	
19 April	Version 1.2	Tele Education Group	
1 May	Version 2.0	Tele Education Group	

Document Approval

The following Software Requirements Specification has been accepted and approved by the following:

Signature	Printed Name	Title	Date

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1. Introduction

Tele – Education is aimed to address various obstacles that students in present Government rural educational institutions face due to distance and/or socio-economical constraints and lack of quality education. Tele - Education overcomes these shortcomings by providing satellite based LIVE quality training with multimedia content for rural students from V to X Standard, which can reach multitudes, cost effectively. Tele Education project is currently running on 1000 schools of Karnataka state. The main objective of Tele – Education project is to bridge the gap in quality of education being provided in urban and rural areas; particularly in government schools, and elevates the learning levels of the students in Mathematics, Science and English (Grammar).

2. General Description

The Tele education project runs using the content distribution system with the help of the satellite network. Here, the students in various schools attend the class simultaneously using the video conferencing technique. Each class session is a live session whereby a teacher or instructor sits in a central studio and delivers the lecture. After each session there is doubt session where the students can ask doubts. In studio, the video is recorded and streamed live in a group of schools. This group of schools is formed area wise according to the taluks in the state.

2.1 Setup

For carrying out the classes, each school has the following instruments and setup:

1. A laptop through which the Internet is accessed so that it is connected to the central studio for the video streaming.
2. A projector, which is connected by the laptop and projects the video to the screen. The screen could be a simply a wall or a white board.
3. A satellite dish, which receives video and is installed on terrace of school.
4. A broadband connection by which the laptop is connected to access the Internet.
5. A mobile phone is given at every school so that doubts can be asked by giving missed calls.

2.2 The current workflow and individuals Involved

a) **School Coordinator (SC)** who is present at each school to manage the proper working of instruments and for the teacher-student interaction.
b) **Nodal Executive (NE)** who resolves the technical glitches of the system. He has the technical skills.
c) **Teacher-in -charge (TI)** who is the in-charge of a group of schools in a block or taluk. He possesses managerial, technical and academic knowledge.
d) **Higher Authority (HA)** who is supervisor of all the actors in the system. He manages all the actors and supervises the activities and tasks done by them. He possesses managerial skills.

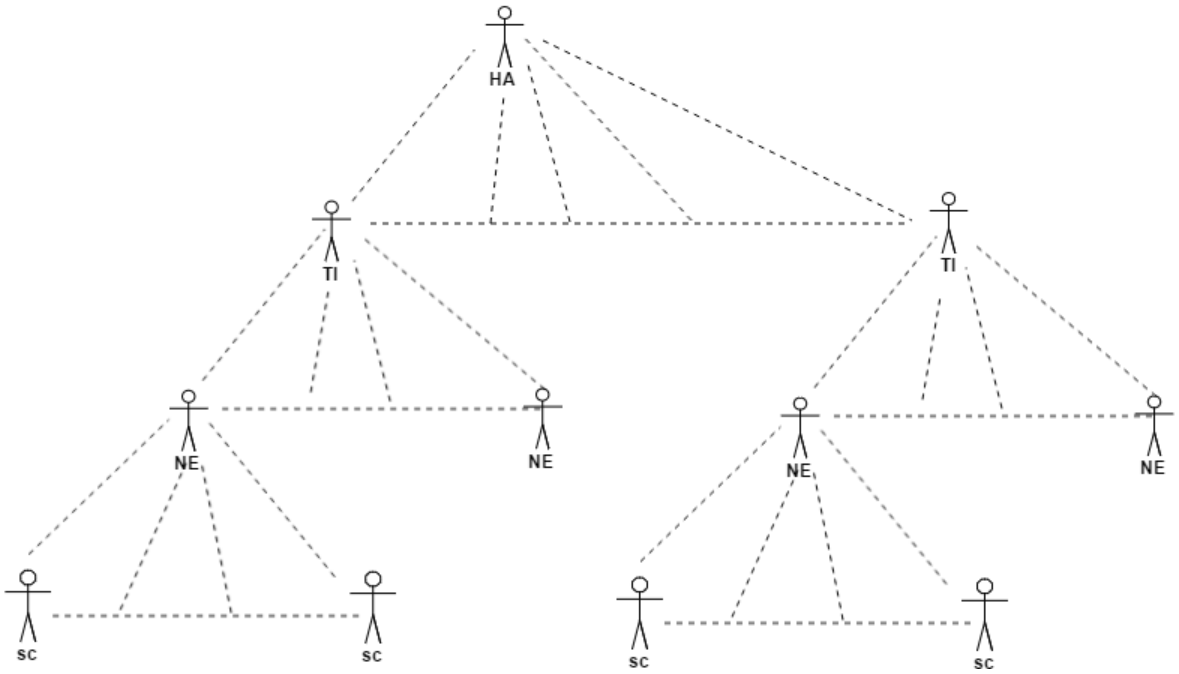
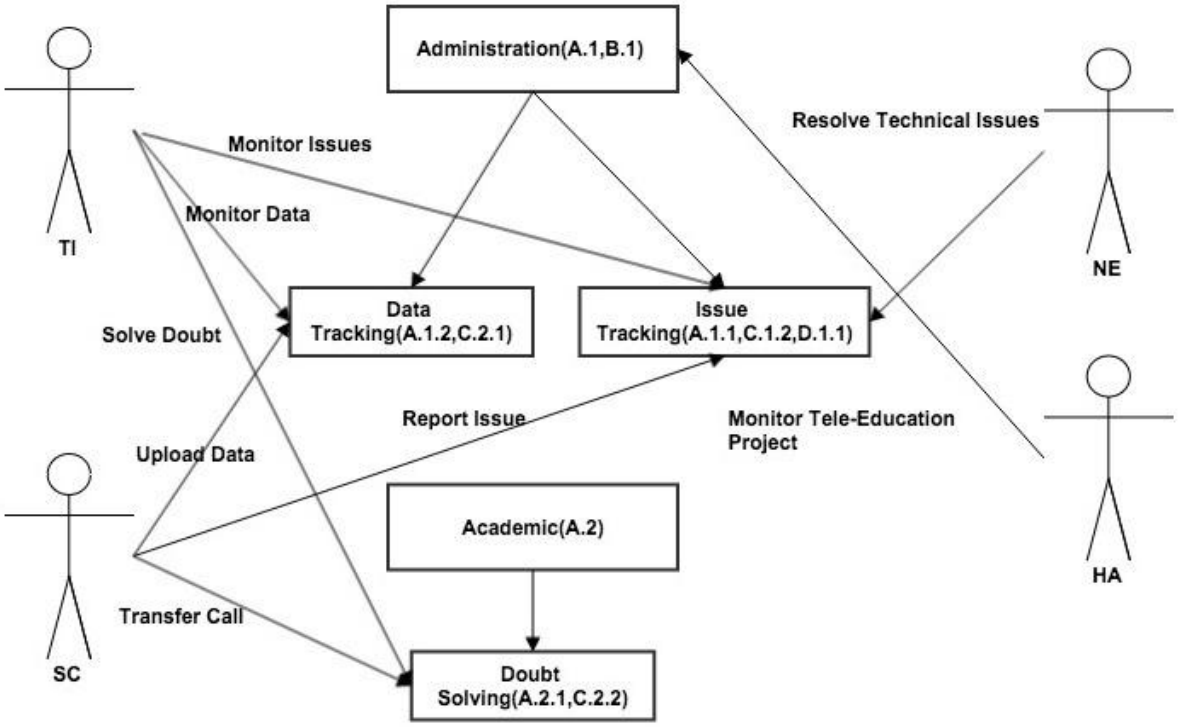


Figure 2.2.1 Actor Hierarchy Diagram

There are 4 different actors in the current system being followed as mentioned above. The workflow can be classified according to actors as following: -

2.2.1 Collaborative Workflow



A. TI

A.1 Administration

In this administrative role the TI is responsible for the various managerial and administrative tasks, which are required for the proper functioning of the system. Here, the **system is the instrument setup and their working**. To carry out these tasks following sub processes are involved:

A.1.1 System and Issues Tracking

Here, the TI checks if the system is working or not as reported by NE. He can also see the routine of the SC of a particular school. Following are the activities for this:

*Activities***:**
A.1.1.1 When the system malfunctions, SC reports to NE about the system.
A.1.1.2 NE tries to resolve the problem.
A.1.1.3 If NE is not able to resolve the problem, he sends the problem status and report to TI. Then TI takes further action.
A.1.1.4 The report for the same is sent by the TI to HA.

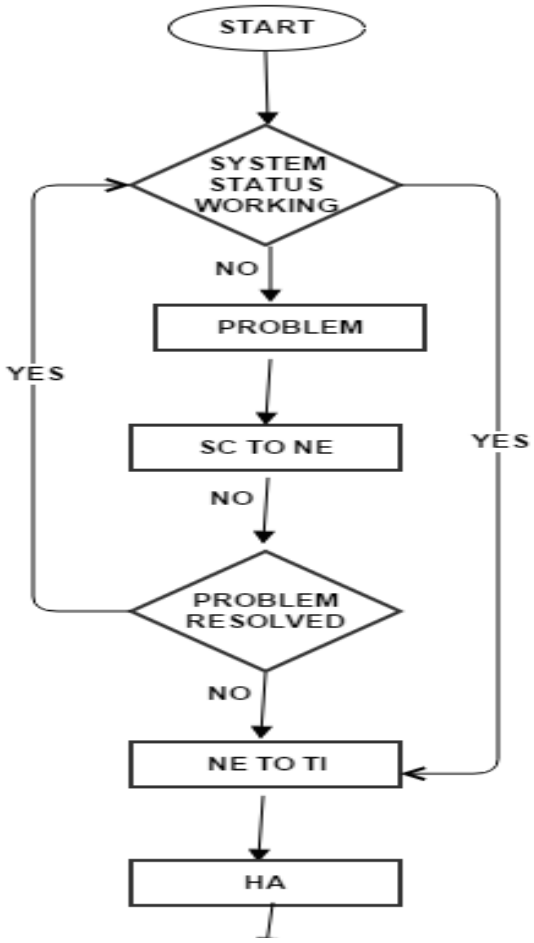


Figure A.1.1

A.1.2 Data Tracking

In this, TI is responsible for keeping a check on the upload of data by SC.

Activities:

A.1.2.1 TI can check whether the data is uploaded by SC or not via the interface provided to him.

A.1.2.2 If the data is not uploaded by the SC, TI can call to him regarding the same.

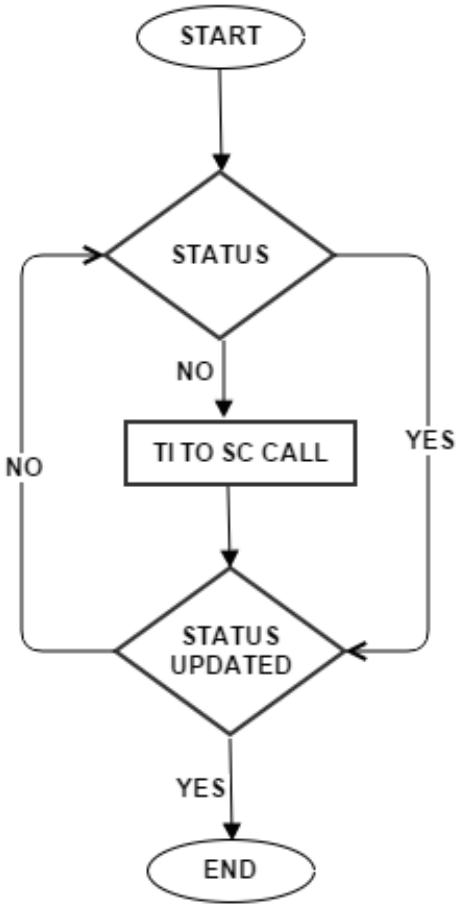


Figure A.1.2

A.2 Academic

In this, TI does all the academic tasks such as answering a question forwarded to him.

A.2.1 Doubt Solving

Here, TI is responsible for the clarification of doubts, which are asked by the students in the doubt session at the end of each class session. The students via a cell phone ask the doubts.

Activities:

A.2.1.1 At the end of each class session, there is a 10 minutes doubt session in which student asks doubts to the **School Teacher (ST)**.

A.2.1.2 If the ST is unable to answer the question; the SC forwards it to the teacher at the central studio.

A.2.1.3 The line of central studio could be busy because of large number of calls from various schools. If the line gets busy, the call is transferred to the TI.

A.2.1.4 TI answers to the doubts of students.

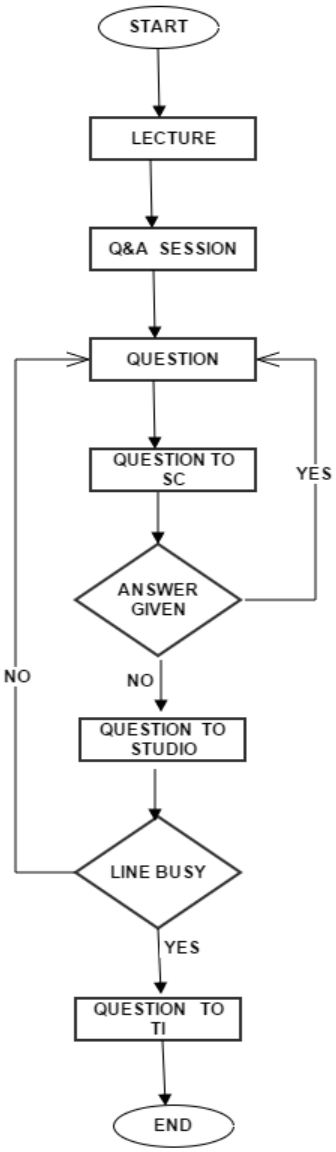


Figure A.2.1

B. HA

B.1 Administration

Currently HA is the actor who is supervising all the activities of the project. He just checks what data is there and what issues have been raised.

C. SC

C.1. Management Issues:

C.1.1 **Management of class**: SC keeps track of class i.e. classes are being properly held or not.

C.1.2 **Report an issue:**

Activities

C.1.2.1 SC report an issue to NE if there is any problem either in a network or a system problem in the school.

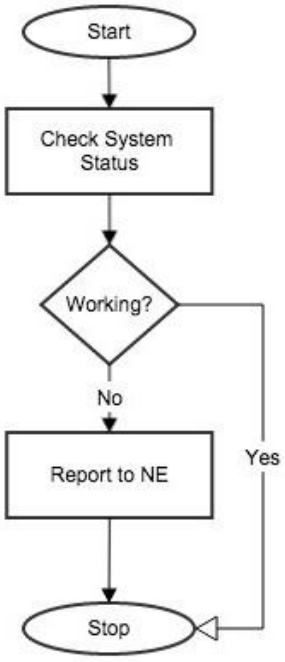


Figure C.1.2

C.2: Academic Issues

C.2.1 **Upload data**: SC uploads the attendance and marks of student and send to TI.

C.2.2 **Doubt Solving**: Helps Students in asking Question during Doubt Session by giving missed call to TI.

D. NE

D.1 Administration

In this process NE is responsible for resolution of technical problems, which are reported to him by SC. To carry out these tasks following sub processes are involved:

D.1.1 **Resolving Technical Problems:** Here, NE address the technical problem highlighted by SC and report to TI. Following are the activities for this:

Activities:

D.1.1.1 When the system malfunctions, SC reports to NE about the system.

D.1.1.2 NE tries to resolve the problem.

D.1.1.3 If NE is not able to resolve the problem, he sends the problem status and report to TI. Then TI takes further action.

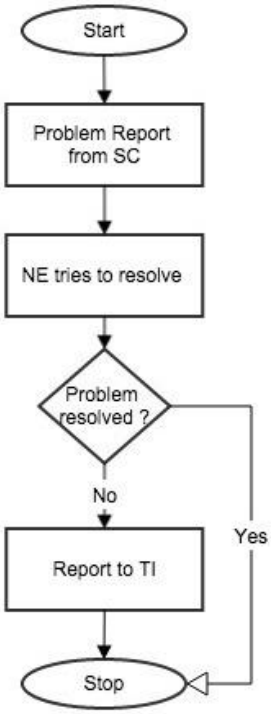


Figure D.1.1

3. Analysis

Based on the requirements that we've gathered, we have come across that the TI is the central actor who has to manage the whole resources and the people around him but in the existing scenario, there are many problems like improper communication, lack of issue tracking system, lack of data summarization and reporting mechanism. Also, other actors like SC to TI and TI to HA are also not connected together through a proper channel or interface. We also think that there can be need of a central repository to store videos and/or audios so that TI can refer to them later.

On analyzing the requirements, we've found out the following gaps in the present case:

3.1 Gaps to be addressed

G.1 Gaps in sub-process A.1.1

G.1.1 No mechanism to know for what reason a system is down in a particular school.

G.1.2 No automated process for tracking of issue. The only way to track the status is by a phone call

G.2 Gap in sub-process A.1.2

No mechanism for TI to enforce SC to upload data on time.

G.3 Gap in process A.1

Lack of a platform for TI to spread a particular message meant for all the SCs under his Taluk.

G.4 Gap in process A.2

Since the doubt session is of short span, there can be questions which TI wants to remember e.g. questions to which he didn't answered properly or any important questions. Thus, there is no provision of a central repository for the TI to put those questions/answers.

G.5 Gaps in process B.1

G.5.1 No mechanism to track the progress of TI and no mechanism to evaluate them.

G.5.2 Lack of a broadcasting platform to inform the TIs of all the Taluks.

G.6 Gap in sub-process C.1.2

No method of sending status to TI if NE resolves the problem or not.

G.7 Gap in sub-process C.2.1

No standard interface for SC to upload the data of the school.

4. Purpose

The Purpose of our project is analyzing and bridging the gaps that exist in the Tele Education project to make it more robust by providing better mechanisms for tracking communication among SC, TI and HA. At the same time adding functionalities to the existing processes by providing a central repository of Questions and Answers to help TI's in answering the questions, and points based rating system for TI's to promote healthy competition.

5. Scope

The Scope of our project is limited to TI administrative work which involves tracking of issues and data collection from schools in his taluk, and TI academic work which involves answering a question forwarded to it and giving mechanism for review of question by means of a points. This project is a standalone project that it can't be clubbed with existing Tele-Education project.

6. Assumptions

1. Video and Audio file would be present in advance.
2. SC will know which NE he need to call when there is issue with set-up.
3. HA maintain the whole project.
4. Five schools are assigned to one NE.
5. We are assuming that there will be broadband connection and camera at TI's office.

7. Solutions Provided

To bridge the aforementioned gaps, we are proposing a system which will act as a dashboard for TI. It will help the TI in various monitoring activities and will serve as a communication medium between all the actors within the network. The proposed system will take care of other actors as well - HA and SC will be provided with a tool to communicate and to aid in their daily managing tasks.

We will solve the above gaps by providing the following solutions to each one of them:

S.1 Solution to the Gap G.1

For issue tracking and school running status, the proposed system will have a *Raise Issue feature* which will allow the SC to directly submit the fault report to TI. Within the report, SC will write the problem and its cause. This will ensure that TI gets the required info of each and every school at a bird's eye view.

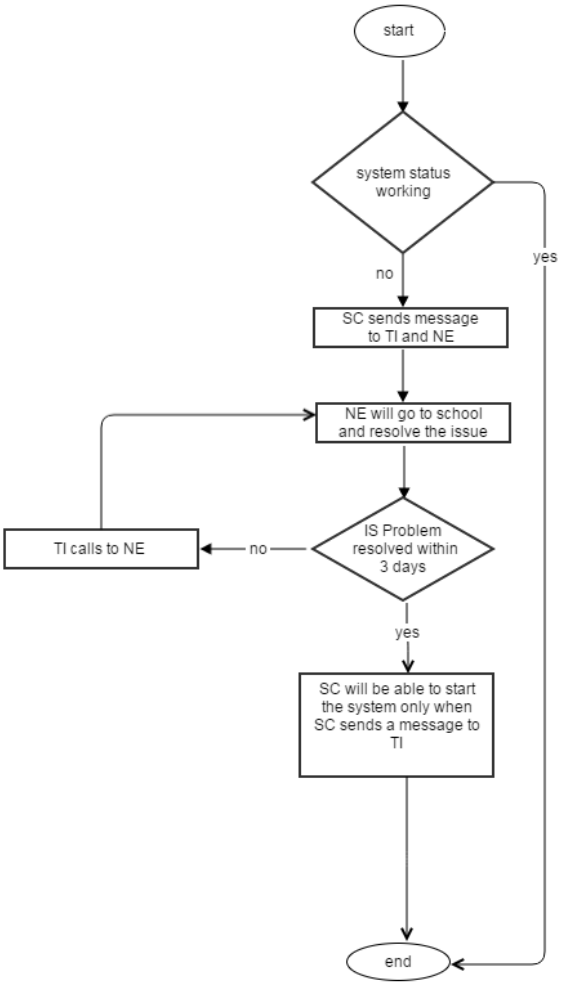


Figure S.1

S.2 Solution to the Gap G.2

TI will be provided with a function of sending warning messages to SC if he fails to upload the data. If he doesn't uploads the data even after warnings then TI will have the power to lock the setup of corresponding SC. Now, SC can unlock the setup by directly calling TI to take his credentials.

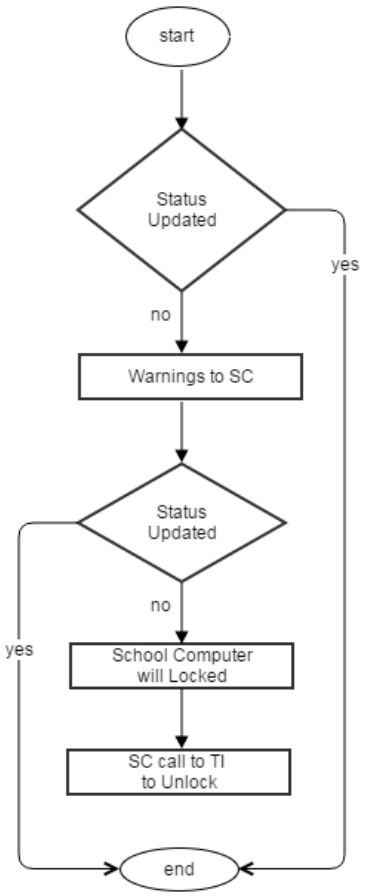


Figure S.2

S.3 Solution to the Gap G.3

There will be provision of the message broadcast feature where TI can broadcast message to all the SCs under him.

S.4 Solution to the Gap G.4

To aid TI in marking important questions and storing them, there will be a facility to store the videos/audios in one place so that TI can refer to them. There will also be a post question/answer feature where TI can post Q/Awhich he finds important for other TIs.

S.5 Solutions to the Gap G.5

S.5.1 The tasks of TI like number of issues resolved can be summarized in the form of reports or logs which can be seen by HA so that he can take proper action. The evaluation of TI can be done with the help of voting method where TIs can vote each other.

S.5.2 There will be a messaging platform for HA where he can broadcast the message to TIs in all the Taluks.

S.6 Solutions to the Gap G.6

When the problem is resolved by NE, SC will be able to update the status of the problem for TI.

S.7 Solution to the Gap G.7

There will be a standard interface for SC to upload the data so that all the SCs upload the data in the same format.

8.Functional Requirements

ID	R 1.0
Ref	S.4,S.7
Title	Question and Answer
Description	TI has to Answer the Question forwarded to him. These are the doubts that are been raised by the students and are not answered by the studio. These questions are then forwarded to the respective TI.
Input	Questions asked by the students over the phone call with the help of SC.
Output	Answer of the question as video

ID	R 1.1
Ref	S.4
Title	Upload
Description	TI's can upload audio and video of question and answers discussed amount student and TI.
Input	Audio and video which are discussed and answered by TI.

Output	Data will be uploaded on the server so as other TI can also see this and review this.

ID	R 1.1.1
Ref	S4
Title	Add Tags
Description	TI can write tags for each and every audio and video. These tags are been used by other TI to quickly see the context of the content.
Input	Keywords relevant to the audio and video are added while uploading.
Output	Tag will be added to corresponding audio and video file.

ID	R 1.1.2
Ref	S.4
Title	Add description
Description	TI can add description of video and audio that he have uploaded. This will be additional information which is used by other TI to know what this audio or video is about.
Input	Text description of the uploaded content
Output	The description will be attached to audio and

	video file.

ID	R 1.2
Ref	S.4
Title	Post
Description	TI can post question and answer which can be broadcasted to TI's.
Input	Questions and Answers of the questions asked by student or TI's own question.
Output	Post will be uploaded on the server and is visible to all other TI's.

ID	R 1.3
Ref	S.4
Title	Vote
Description	TI can vote for any post and according to number of votes ,TI will get points. This is to create healthy competition among TI so that review of question and answer will be there.
Input	TI's vote for a video. Up vote – Down vote

Output	Points will be added to corresponding TI

ID	R 1.4
Ref	S.4
Title	View notification
Description	TI get message regarding post posted by him and TI can also send message on other post this info is carried in the form of notification to other TI's
Input	Events like post, message which will generate the notification
Output	Other TI's will receive the notification.

ID	R 1.4.1
Ref	S.4
Title	Respond to messages
Description	TI can send message in reply to any message
Input	Message
Output	Notification to other TI .

ID	R 1.5
Ref	S.4
Title	Raise issue
Description	TI can issue raise issue regarding any post.
Input	Message
Output	Notification to TI corresponding to post

ID	R 1.5.1
Ref	S.4
Title	Request answer update
Description	If issue is raised for post by any TI then corresponding TI will respond to that issue

Input	Request for update on a post on
Output	Notification to other TI with the requested post.

ID	R 2.0
Ref	S.1,S.3,S.6
Title	Class Running Status information to TI
Description	These requirements talks about Classes running seamlessly. If because of any reason class is not going on, then this information should be presented to Teacher In charge. Various reason that class not going on are 1:Network problem 2:System Problem 3:Coordinator not present or local holiday.
Input	Data from various schools with the help of broadband connection is transmitted to central server.
Output	TI will be able to know that in which school classes are not going on and the reason for

	the same will be logged by TI for if any issue is there.

ID	R 3.0
Ref	S.1,S.2,S.7
Title	Data Collection Status
Description	All the School Coordinator should insert data like Attendance, Marks & Data. This data will be available for TI as well as Higher authorities for viewing and knowing the status of the program. Current system has data collection functionality but it's not full proof and the responsibilities are not set if the data is not collected.
Input	Data by various school coordinators with the help of tool that is present their in every laptop in every school.
Output	TI and higher authorities will be able to view data collected from various schools and if data is not collected then the reason for the same will be given and logged by TI.

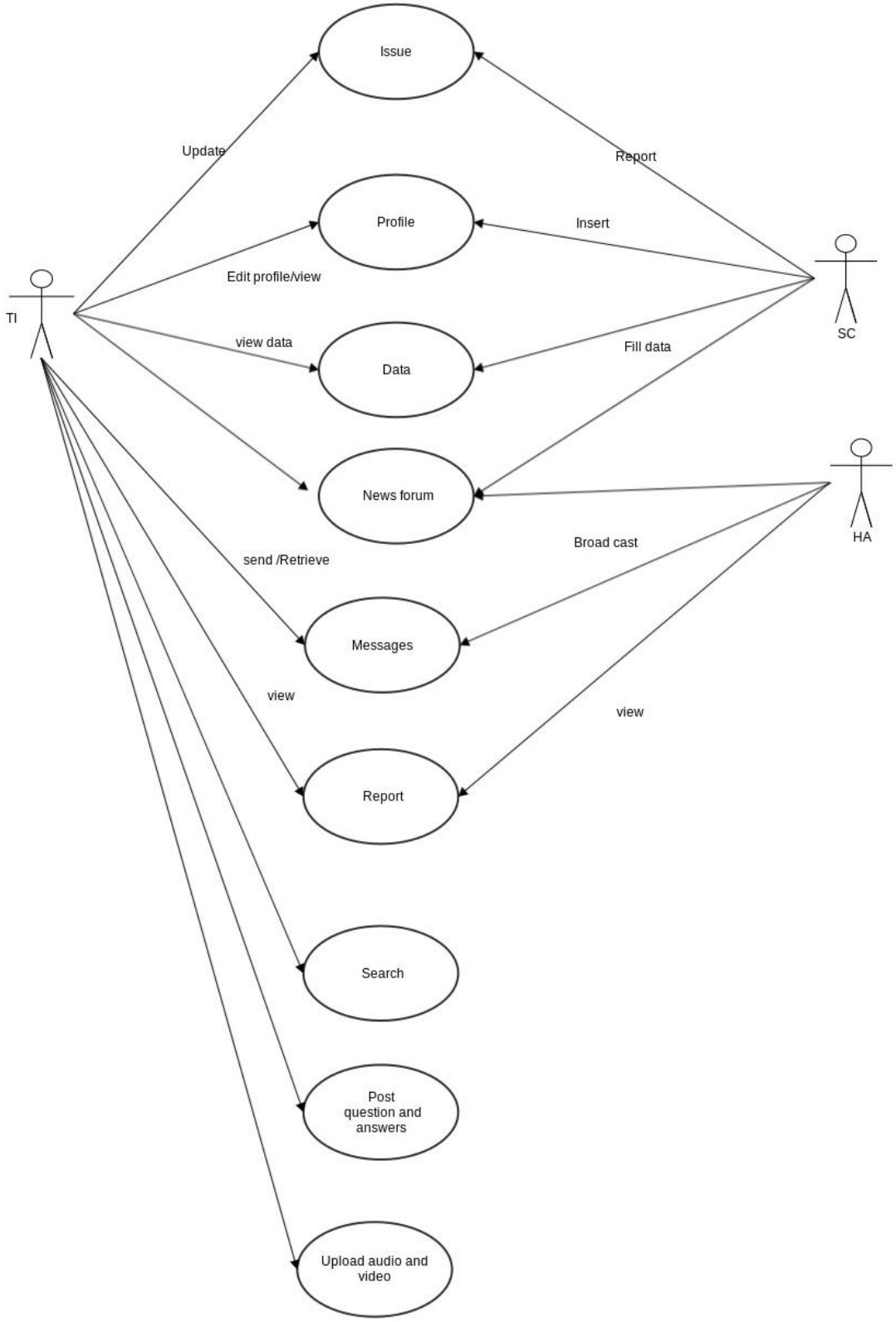
Id	R 4.0
Ref	S.3
Title	TI Interconnection.
Description	The system connects all the TI's on one platform where the post made my one TI is visible to all TI.
Input	The message by TI.
Output	Message visible to all TI.
Id	R 4.1
Ref	S.3
Title	TI connection with school coordinator.
Description	The message sent by TI is visible to all school coordinators under him.
Input	The message by TI.
Output	Message visible to all school coordinators under the TI.

Id	R 4.2
Ref	S.5
Title	TI Attendance
Description	In the report the attendance of all the TI is there.
Input	Daily attendance of TI.
Output	Monthly report of the attendance.

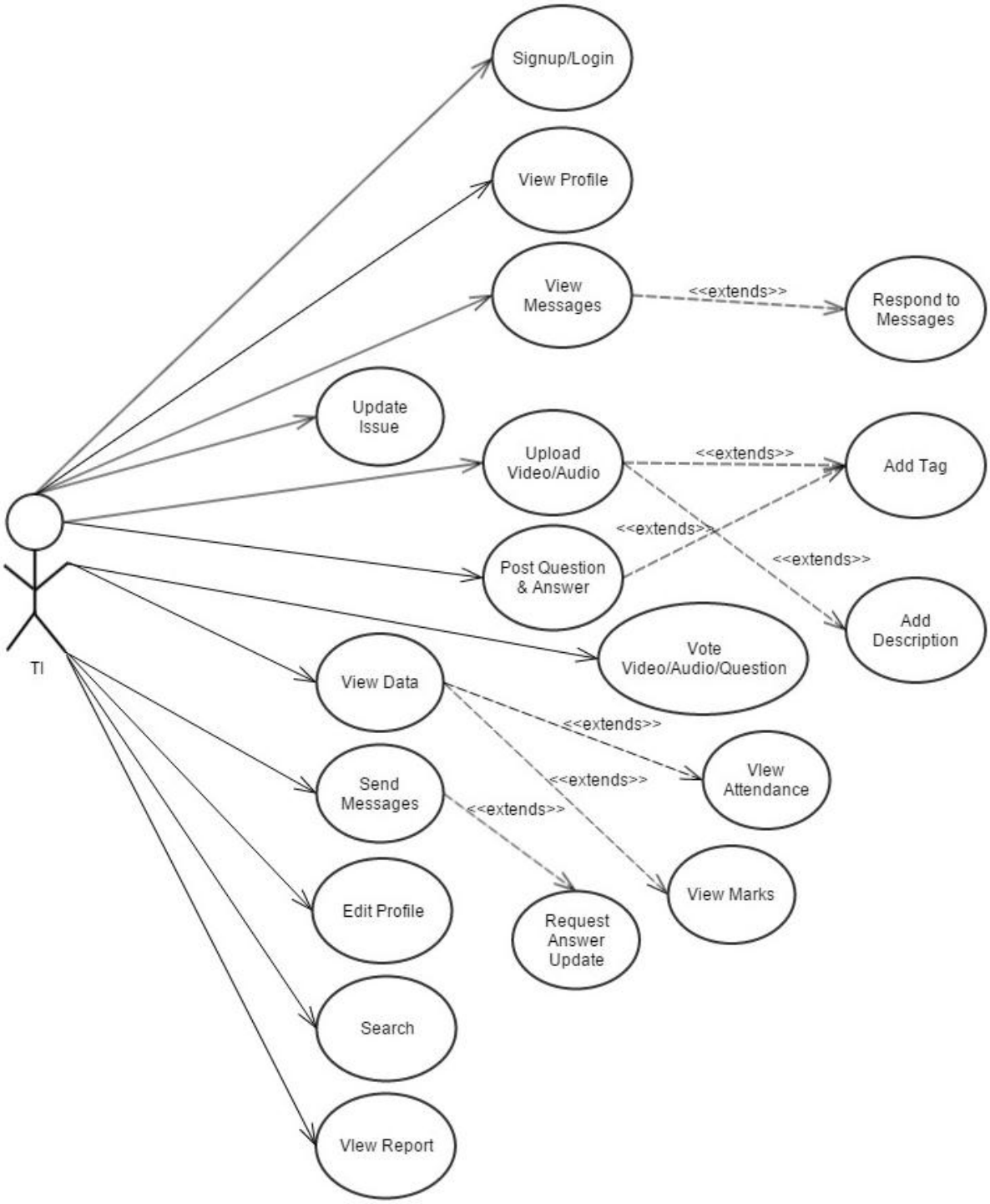
Id	R 5.0
Ref	S.5,S5.1,S.2
Title	Monthly/ Bi Weekly Report
Description	The monthly report generated for all data.
Input	The data that is collected on weekly or daily basis.
Output	The report generated from all data.

9. Use Cases

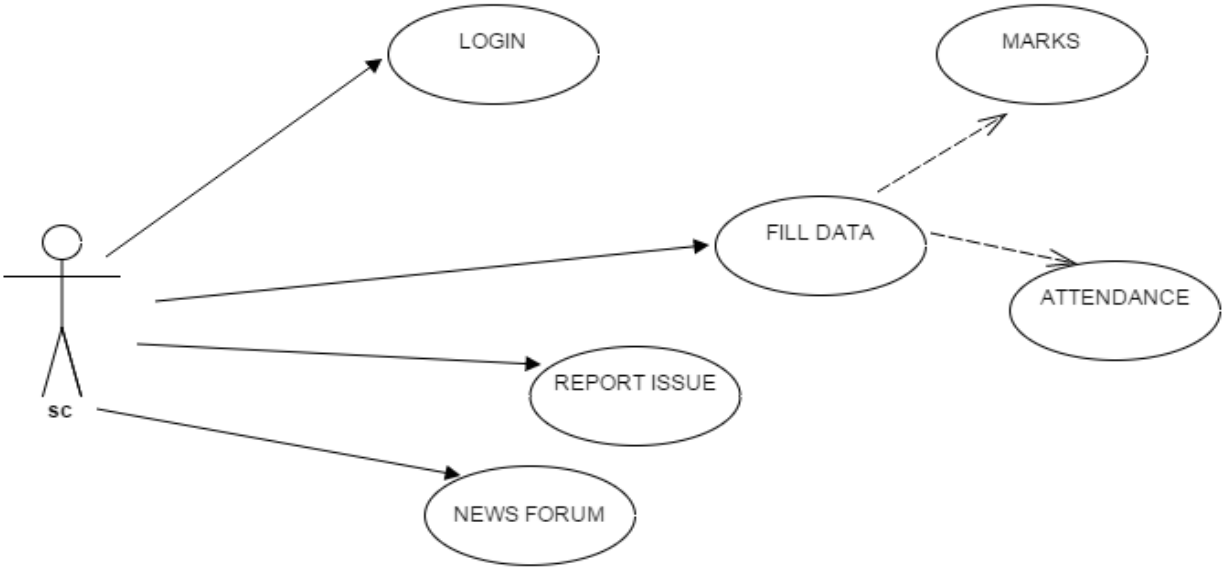
9.1 Combined System Use-Case



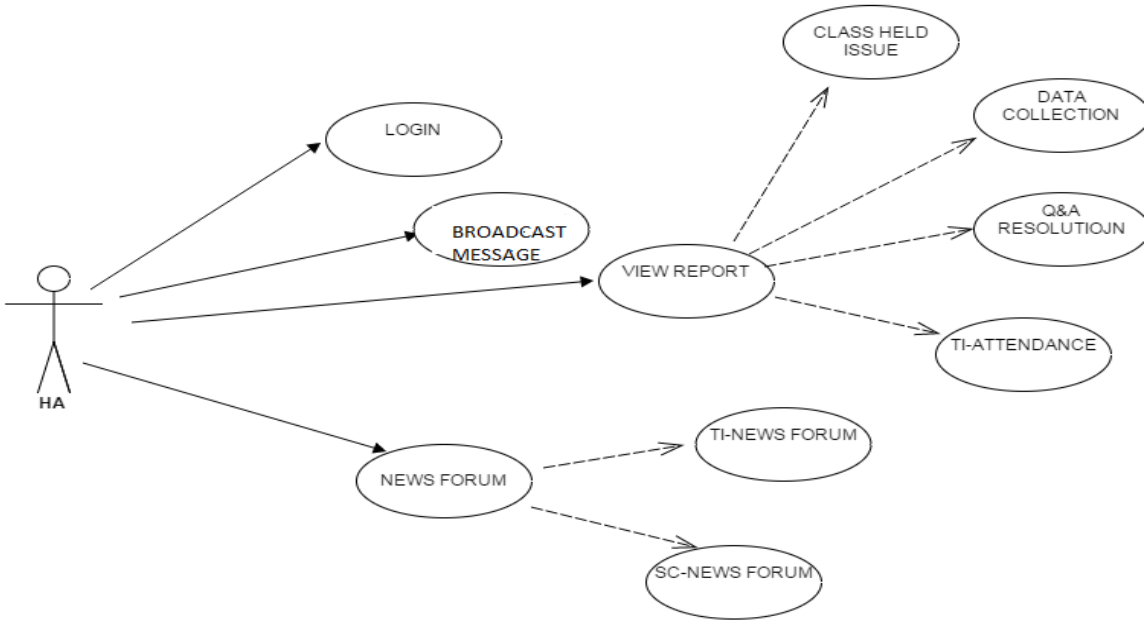
9.2 TI (Teaching In-charge)



9.3 SC (School Coordinator)



9.4 HA (Higher Authority)



10. Software and Hardware Requirements

10.1 Software Requirements

1. Operating System : Windows XP/7/8/10 , Ubuntu , Mac.

2.Browser : IE , Chrome , Firefox, Safari.

10.2 Hardware Requirements

1.Processer : Dual Core.

2.RAM : 2 GB .

3. Display Resolution: 1024 x 768 .

4. HDD : 250 GB.

11. Glossary:

Term	*Description*
TI	Teacher In-charge
SC	School Coordinator
ST	School Teacher
NE	Nodal Executive
HA	Higher Authority
System	Instrument setup and their working