5) Development of flowcharts and front-end platforms
6) Programming the software

3.2.1 Teacher and Student User requirement specification (URS)

During this stage, through discussion and review specification of the multimedia requirement is derived. The needs of the context, the needs of the teachers, students and multimedia generation process for open source material are perused.

User Requirements are essential to determine what the customer/system user and application requires from the software. User requirements provide an overview of what software capabilities are necessary. Here the users are Teachers, Learners and Educational practitioners. The software needs to be developed to these needs. The software should have the facilities that are helpful to teachers and learner to access the resource that are not available in traditional system By keeping in view these points and criteria researcher outlined user requirement specifications.

3.2.2 Administrative needs software requirement specification (SRS)

The software has two sections. The first one is the admin section which can be accessed by the administrative personnel with the help of password. The admin will provide facility to build content of the units to be taught with standard, unit number of teaching points and teaching objective. In this section the admin will be a teacher (Master entry).

The software requirements specification outlines plans of the researcher for the software functioning and its processes. Also provides revision level and any patches that can be used etc. In essence, the SRS shall outline the intended use of the software. Coupled with the software risk analysis, the SRS will show that a manufacturer has addresses all potential risk factors associated with software performance. The researcher has considered the needs of resource management of unit such as state education body, role of teachers who involve in national development. The managing the resources evolved by various teacher, pooling, sorting are some of the activities that need to be incorporated.

3.2.3 Application of Teaching-Learning principles

The educational principles cannot be scarified while preparing software. The
teaching learning dimensions are to be essentially incorporated. They are detailed herewith:

A. Every specific objective requires a specific content part and explaining media presentation..

B. Student learns with differential abilities in relation to media, like text, pictures, animation etc. Suitable media should be provided to cater to the need of different ability learners.

C. Teacher should have freedom to recognise content point and media as per the temporal context and the resources should be flexible to that extent.

D. Linkage of objectives, content learning experience with evaluation slab can be pre-planned and used in class.

E. Learners expected resources can be provided with expository learning with open source web-cites.

3.2.4 Teaching- Learning component coverage /Design Specification (DS)

Under this stage the researcher designed various inputs of teaching learning through review. It is felt that the software should have components namely, descriptive text, power point presentation audio presentation and video presentation. The various possibilities including to linking with web resources is also used.

3.2.5 Development of flow charts and front-end plat forms

All the aspects that are described based on the above four steps were used to form a logistic flow chart, that will describe comprehensively the total software programme components and functioning. The researcher interacting with computer programmer worked out the flow chart. The flow chart represented is as detailed below;

Flow Chart representing various Functions of Teacher and user:
3.2.6 **Programming the software;**

The programme experts with continuous interaction evolved draft software that is functional and fit to try out.

The programme preparation has used operating system windows, with front-end tool, visual studio c++, Back-end tool used is MS Access

**3.3 PHASE-II: INTERNAL VALIDATION**

3.3.1 **Compatibility and Installation testing [IQ or QD experts]**

The programme will run by installing into different computers with different windows version and will be tried for its correct installation .hard disk setting
the base management and other requirements. The programme was installed in
to different models of desktops and laptops. The software was installed to
various version of window. The bugs were identified and eliminated by
debugging with the help of programmer.

3.3.2 **Admin comfort testing with teachers**

The admin user tried out to identify the functional objectives by teachers and
content material infusers. The programme was introduced to the admin target
group and is constantly interacted to understand the difficulties faced by them.
The admin group was also support by assisting with required PPT Text material,
video clipping so that they can also be uploaded and tried out. The sample
content programmes prepared by the admin group were studied for their
functionality. The errors identified were debugged with the help of programmer.

3.3.3. **Field based use by practicing Teachers**

The school teachers with computer friendliness are identified and the draft
programme prepared with content is provided. The teachers are asked to use it in
classroom teaching. The teacher tried out the material in their day to-day
practice. The researcher constantly kept in touch with teacher. The difficulties
faced by the teachers are listed and with the help of programmer the debugging
process is done. The suggestion provided by teachers regarding the use of fonts,
coloring were also incorporated.

Some of the students were also provided the programme, to use at home
as study material, some of them used independently and some with the help of
parents and support facilities. The difficulties faced by the learners were also
taken to the programmer and are incorporated.

3.3.4 **Lab-try out with students**

A group of students from 9th standard of a school were oriented with
the computer software, after the teach of content, they were asked to use in the
school lab the material as remedial teaching. The group was supervised by the
teacher and researcher regarding its usability and learning capacity. The
feedback gained during this stage is also used for adopting and improving the
software.
3.4 PHASE-III: EXTERNAL VALIDATION

The researcher designed for a parallel group as appropriate for internal validation. The developed material is to be tested in real school situation. Two classrooms of standard 9th having equal competencies and achievement are required for this purpose. The teacher teaching in these sections should have positive attitude towards using ICT material instructional system.

Following is the research design adopted for the study:

![Experimental Design](image)

3.5 TOOLS USED AND PREPARED:

3.5.1 Pre test

As per the syllabus the unit of Shivaji the Emperor is taught to the 9th standard students which appear before Mogul dynasty unit under social science subject. A unit
test is prepared based on the content. Teachers are consulted to get clarity on the relative importance given to different sub unit and learning objective.

A blue print is worked on the available information. A question paper with 50 marks with questions, objective, short answer and two to three sentence response questions, long answer with not more than five sentence response are framed. The purpose of this test was to understand relative competence of learners to comprehension and achievement ability. The achievement also aids to form two equal groups for experiment.

3.5.2 Post treatment Achievement Test

The content selected for the experiment is on Mogul dynasty, a unit from 9th standard social science book prescribed by DSERT, State Government of Karnataka. The unit has 8 sub units. The importance to the various sub aspects were divided based on the content description provided. A blueprint is prepared and achievement test is prepared following similar procedure as fallowed for pre-test. The purpose of the question paper was to find out the relative effectiveness of two instructional systems under experiment. The question paper is initially tried on set of student in a different school to ascertain its reliability and validity. The reliability was found by test-retest method with a gap of twenty days and was found to be r=0.83

The validity was ascertained by comparing scores of achievement with a similar question paper prepared by class room teacher and administered to the some set of students.

3.5.3 Multiple Intelligence Test (MI Test)

The researcher decided to use multiple intelligence test, as one of the criteria to equating the group. The reasons are as below.

1) The MI test presumes that learning is boredom pre capacity such as visual, audio, spatial, etc. The software presently evolved has multimedia approach.

2) The MI presumes intelligence as a biological and psychological potential

3) MI is the neutral on the questions of heritability of specific Interaction and underscores environmental interaction as major factor.
4) The authors propose that intelligence is a set of talents in the linguistic or logical mathematical phases.

The MI test prepared by Howard Gardner used has following specificity. The tool standardized and reported that it has seven dimensions of the multiple intelligences profiling questionnaire (MIPQ VII) based on Gardner’s MI theory (2006). Operationalization of the seven MI dimensions was tested with an empirical sample of finish preadolescents and adults (N=410): firstly, internal consistency of the MIPQ VII was tested; secondly, correlations between the seven MIPQ VII dimensions and the background variables (age, gender) were analyzed; fourthly, the external validity of the seven MI dimensions was studied with a confirmatory factor analysis (CFA), results of the internal consistency analysis showed that the seven MIPQ VII dimensions had satisfactory reliability coefficients with both sub sample. The results of CFA showed good generalize ability characteristics of the scales. Combined sample (N=410) did fit the model better than the two sub samples, indicating good generalized ability of the model. Results of the MIPQ VII inter-scale correlation analysis showed that logical mathematical intelligence correlated positively with spatial intelligence in both samples and linguistic correlated positively with intrapersonal intelligence. The further details of the validity and reliability are available at Howard Gardner Multiple intelligence test: SENSE Publisher: ROTTERDAM/BOSTON/TALPEI.

Reaction scale /Opinionnaire;

The study required a set of tools as dependent variable measuring important determinants that affect the study. A set of tools were prepared. Three rating scales were prepared to collect the opinions regarding MMLP and its applications as listed below;

a) Student Reaction Scale/Opinionnaire; The Student reaction scale in using computer software for CA-MMLP was prepared using 5 categories responses for three parts. The items under parts are as below:

1) MMLP software user friendly
2) MMLP software flexibility.
3) MMLP software acceptance
This Opinionnaire consisted 32 statements/items Constructed using a five point scale which ranged from Strongly Agree, Agree, Neutral, Disagree, and strongly disagree.

b) Teacher reaction scale /Opinionnaire; The Teacher reaction scale in using computer software for CA-MMLP was prepared by using 5 categories responses for 3 different parts. The items under parts are as below:
   1) MMLP software user friendly
   2) MMLP software flexibility
   3) MMLP software acceptance

This Opinionnaire first part has 10 items, second part has 9 items and third part has 12 items to express. A total of 32 items were constructed using a five point scale which ranged from Strongly Agree, Agree, Neutral, Disagree, and strongly disagree.

c) Resource persons reaction scale/ Opinionnaire ;The Resource persons reaction scale in using computer software for CA-MMLP was prepared using 5 categories responses for 3 different parts. The items under parts are as below:
   1) MMLP software user friendly
   2) MMLP software flexibility.
   3) MMLP software acceptance.

This openionnaire second part, user friendly, flexibility has 10 items and another part acceptance has 9 items to express. A total of 29 items were constructed using a five point scale which ranged from Strongly Agree, Agree, Neutral, Disagree, and strongly disagree.

d) Students Learning Competency Scale: The Student learning competency scale in using computer software for CA-MMLP was prepared seventeen statement/items to express are constructed using a three point scale which ranged from Agree , Disagree, and not sure .

3.6 PROCEDURE USED FOR SCALE DEVELOPMENT;

A brain storming session was conducted with fifteen research scholars for each of the tools. Before the session the conceptual idea of the construct was explained to the group. The group was then called upon to suggest the activities,
tendencies, feelings, and behaviors that will either express the pro action towards or anti stand of the individual. A large number of items were collected. During the green signal session each of the items were critically analyzed.

For its scope to use and limitations.. The group provided items for field tryout. The available items were then placed in the attitude scale format and were administered to a sample of 50 students centering on software that was introduced to them earlier and were allowed to use. The data collected was further statically analyzed with item analysis and items with high correlation were selected for inclusiveness was selected for the tools. Same procedure was followed for all the three tools.

3.7 THE RESEARCH DESIGN AND SAMPLE

The researcher designed for a parallel group to be appropriate for study. The developed material should be tested in real school situation. Two classrooms of standard 9th having equal competencies and achievement are required for this purpose. The teacher teaching in these sections should have positive attitude towards using ICT material instructional system.

Following is the research design to adopted the study;

3.8 SCHEME OF EXPERIMENTAL DESIGN

Step-1
Selection of the classroom as units of teaching, two classrooms rooms from the researcher locality.

Step-2
Equating the two groups for their pre entry behavior to experiment.
   i) Administration of Multiple Intelligence Tests
   ii) Administration of content specific achievement test as previous chapter of History unit social science
   iii) Administration of computer competency test.

Step-3
Sorting two classes with students N=40 carefully selected, by equating on the administered test.
Step-4
Random selection one class for experimentation and another class is control group. Here the control group teacher is informed that he is to teach in his usual practice and use all text, map resources that usually used in the class. The experimental group teacher is oriented and trained to teach with software.

Step-5
Orientation to the two subject teachers regarding their work for two week instruction.

Step-6
Providing treatment to the two groups as per the design.

Step-7
Administration of post-test with following test.
- Content specific achievement test for Mughal History on selected portion.

Step-8
Administration of reaction scales to the teachers and other CAI users.
- i) Teachers reaction scale
- ii) Teacher Educators reaction scale

3.9 SAMPLE

The researcher at his locality in the Bellary city of Karnataka India identified two schools that are suitable for the study. Both are English medium schools and are motivated for taking the work.

The schools selected are; in Bellary district, Bellary of Karnataka state in India;
- i) Narayan Techno School, Bellary nearby Kuvempu Nagar,
- ii) Adrash School. Bellary, Parvathi Nagar

The schools have one section each for the standard 9th with 40 students.

3.10 PRE EXPERIMENTAL OPERATIONS

Before experiment the researcher administered the pre experimental tools to both sections of two schools. The tools used are;
- 1) Multiple Intelligence test.
- 2) Specific achievement Test as previous chapter of history unit in social science.
- 3) Computer competency test
The data available on each of the tools are listed. Best efforts were made to evolve pairs having one student of a school with another student of the other school with similar scores on all the three test scores. The researcher was able to identify number of student pair with almost equal scores. The students who were not able to pair are considered as proxy students in the class. However student were not informed regarding they are included in the research design are not.

3.11 EXPERIMENTATION:

The researcher installed the software in the lab tops and provided the software with content to experimental groups teachers. He is given sufficient time to familiarize with software and content. He is guided to prepare a plan of instruction for the unit with ICT mediation. The treatment was for 15 periods and was prepared to take as per school time table with the help of Head master/coordinator. The classroom was setup with LCD projector that can be used during specific period. Students interested to use the ICT mediation software were provided with facility to use at home.

The control group teacher was provided with text print of all the material available in the software. The researcher supported the teacher to prepare a plan of teaching for fifteen period with all the competencies of teachers. The historical maps of Mughal dynasty and picture of kings etc, were made available from the school as well from researchers resource collection.

Both the teachers experimented teaching for fifteen days. There was no contamination between the two groups as they belong to two separate schools and were apart from five kilometers.

3.12 POST EXPERIMENTAL OPERATIONS

After completion of the treatment phase the students of both the groups were administered with, achievement test on the unit Mughal dynasty specifically to the content taught.

The experimental group students were administered with additional student response scale sheet. Teachers involved as sample in experiment and others who used it as sample try out in their respective class were administered the response sheet on quality of software.

Researcher had opportunity to attend a teacher educators workshop. at DIET. Bellary. The group consists of 40 teachers educators from various teacher educators District of Hyderabad and Karnataka region. The groups were oriented to the software
for an hour and were provided, with hands on experience in the ICT lab. They were individually attended as and when required. They had small group discussion on the merits and demerits of the software. The group was administered with the response scale prepared for teacher educator.

3.13 DATA ANALYSIS

The achievement score available for the two groups on pre test and post test were used for testing hypothesis with t-test. The mean achievement scores, standard deviations are compared with the computer.

The responses of various stake holders normally students, teachers, teacher educators were analyzed using graphical representation and percentage analysis.
CHAPTER –IV

NATURE OF MMLP-WEB LEARNING SOFTWARE

4.0 Introduction
4.1 Software Configuration
4.2 Modules of the Project
4.3 Flow chart: Function Descriptive
4.4 DFD Symbols
4.5 Data Flow Diagram
4.6 Front-End Plat Forms
4.7 Part-A: Teachers Screen Show
4.8 Part- B: Student Page/Learner Screen-Show
CHAPTER -IV
NATURE OF MMLP-WEB LEARNING SOFTWARE

4.0 INTRODUCTION

This software is to systematically store the resources in the form of text material, audio, video, power point related to specific content corresponding to each of the learning. The software supports quick move from on content specifically to another.

In this software teacher can load topics details about any subjects that is text file, ppt file, audio file, video file and images also. This software supports to effectively use variety of resources in classroom effectively. The software also supports students to use as self learning material.

The software is widow based hardware configuration is as below;

- Processor with 1.3GHz Speed
- 512 MB DDR RAM
- 40 GB Hard Disk
- 52X LG CD R/W
- Logitech Mouse
- Keyboard

The software support required is;

4.1 SOFTWARE CONFIGURATION

i) Operating System: Windows XP Service Pack 3 or its equivalent

The software is used with the help of visual studio c++ as front end tool is MS Access or its equivalent.

ii) Front End Tool: Microsoft Visual Studio.NET 2010 C#

iii) Back End Tool: MS Access

4.2 MODULES OF THE PROJECT

There are two modules of the project;

1. Admin Module

The software has two modules Admin is for teacher to operate and store the data for each of the specific objectives and corresponding content points. This can edit and used in the classroom. The user can open for learning. The details are as
below;

- Add Master Data
- Delete Teaching Point Records
- Delete Activity Details
- Change Password
- Unit Entry
- Data Entry
- Add New User

2. **Student Module**

- Change Password
- View All Teaching Points (Word file, ppt file etc)
- Submit Answers

**4.3 FLOW CHART: FUNCTION DESCRIPTIVE**
Flow Charts

Admin Login

Add Master Data
Unit Entry
Data Entry

New User Registration
Delete teaching Point
Delete activity Details
Change Password
Log Out

User/Student

Change Password
View All Teaching Points
View Questions
Submit Answer
View All Activities
Log Out

Data Flow Diagram Description:
The data flow diagram (DFD) is one of the most important tools used by system analysts. Data flow diagrams are made up of a number symbols, which represent system components. Most data flow modeling methods use four kinds of symbols. These symbols are used to represent four kinds of system components. Processes, data stores, data flows and external entities. Processes are represented by circles in DFD. Data Flow represented by a thin line in the DFD and each data store has a unique name and square or rectangle represents external entities.

Unlike detailed flowchart, Data Flow Diagrams do not supply detailed description of the modules but graphically describes a system’s data and how the data interact with the system.

To construct a Data Flow Diagram, we use,
- Arrow
- Circles
- Open End Box
- Squares

An arrow identifies the data flow in motion. It is a pipeline through which information is flown like the rectangle in the flowchart. A circle stands for process that converts data into information. An open-ended box represents a data store, data at rest or a temporary repository of data. A square defines a source or destination of system data.

Six rules for constructing a Data Flow Diagram
- Arrows should not cross each other.
- Squares, circles and files must bear names.
- Decomposed data flow squares and circles can have same names.
- Choose meaningful names for data flow
- Draw all data flows around the outside of the diagram.

4.4 DFD Symbols

In the DFD, there are four Symbols

1. A square define a source or destination system data