CERTIFICATE

This is to certify that Ashish Bansal(7452) and Ojasvi Aggarwal(7448) of Shaheed Sukhdev College of Business Studies have worked on the project titled “SCHOOL MANAGEMENT” and have completed the project according to guidelines under my supervision.

Mrs. Kavita Rastogi

_____

ACKNOWLEDGEMENT

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals. I would like to extend my sincere thanks to all of them.

I am highly indebted to Mrs. Kavita Rastogi for her guidance and constant supervision as well as for providing necessary information regarding the project & also for her support in completing the project.

I would like to express my gratitude towards my parents for their kind co-operation and encouragement which helped me in completion of this project.

I would like to express my special gratitude and thanks to my fellow classmates for giving me such attention and time and helping me throughout the project whenever I got stuck at any point.

TABLE OF CONTENT

- **Introduction** 4
  - Purpose of the project 4
  - Scope of the project 4
  - Overview of the project 5
- **Requirements Analysis & Specification** 6
  - Functional requirements 6
  - Non-functional requirements 11
- **Feasibility study** 13
- **System specification–H/W and S/W requirements** 14
- **Software Design** 15
  - Process model 15
  - Data flow diagram 16
  - Data dictionary 23
- **Project Management** 24
  - Computing FP 24
  - Discussion on computation of effort and size 26
  - Risk Table 27
  - Timeline chart 30
- **Design Engineering** 31
  - Architectural Design 31
  - Data/ Database design 32
  - Component Level Design-cohesion and coupling 34
- **Testing** 36
  - Test plan 36
  - Test-procedure specification-basis path testing 37
  - Test-case specification 43
- Bibliography 44

SRS (SOFTWARE REQUIREMENT SPECIFICATIONS)

INTRODUCTION

The introduction of the Software Requirements Specification (SRS) provides an overview of the entire School Management System with purpose, scope, definitions, acronyms, abbreviations, references and overview. The aim of this document is to gather, analyse and give an in-depth insight of the complete ONLINE SCHOOL MANAGEMENT SYSTEM by defining the problem statement in detail. Nevertheless, it also concentrates on the capabilities required by stakeholder and their needs while defining high-level product features. The detailed requirements of the online portal are provided in this document.

- **Purpose of the project**

  The project entitled SCHOOL MANAGEMENT SYSTEM has been designed and developed in such a way that any school may use it. The aim of the software is to automate various functions that are being performed in most of the schools in general like assignment submission, internal marks updating etc. Forging ahead to next generation of technology, information related to school management i.e. various kind of functions or documents that are needed to be passed to the students, to the teachers or within the school. This software brings all school management processes, from assignment submission to generation of scorecards of the students and their record graphs.

- **Scope of the project**

  The main aim of this project is to develop a software to overcome the limitations of the present system. Most important feature of this software is online exam department that will keep students updated about coming exams, previous year papers etc.

This software also provides security with the help of logins, passwords. A website management department have all the accesses to add or delete information, update information in the website etc.

- **Overview of the project**

The developer is responsible for:

- Developing the system
- Conducting any user training or the demonstration for using the software.
- Maintaining the system for a period of one year after installation.

Requirement Analysis and Specification

❖ Functional Requirements

The idea is to develop a web application for a school management. The web application will be designed in a way to satisfy the desired needs of teachers, students and parents. This will be developed to maintain the records of the students (score records, teachers feedback) etc.

The general layout of the website is as below and is further described.

- Student information- This section will contain various information or records that are important for school regarding a student. The basic records to be maintained about a student will be:-

  - Name
  - Father's Name
  - Mother's Name
  - Address
  - Contact
  - Admission Number
  - Admission Year
  - Fees
  - Mode of transport

The above information would have to be recorded at the time the student gets admission in the school. This information is required when exam forms are filled and details have to be validated.

The database will be created and maintained by the school in charge at the time any student gets admission in the school.

- Login- In this section, there would be four different types of login options: - 1) Student login, 2) Teacher login, 3) Website Management Dept. login, 4) Exam Dept. login.

  If any of the above 4 groups want to upload anything or view any information, they would have to login first and then enter the website.

  Four databases would be created for this section. 1) Student Login (containing student admission number as username and password), 2) Teacher Login (containing teacher id as username and password), 3) Website Management Department Login (containing Wmember id as username and password), 4) Exam Department Login (containing Emember id as username and password).

  This section would also be maintained by the website management department. For ex: every year, new students will get admission and new accounts would have to be created, which would be done by website management department. Whenever a new teacher or a new member in website management department or exam department would join the school, they would get a respective id which will be used as their usernames for logging into the website. And their accounts will again be created by the website management department.

- Class wise record and Information-This section will be developed in order to help the students about what is currently going on in the class. Purpose of the section:-

- Assignment and submission record- This would be helpful to let students know about the assignments they would have to submit and the time limit for that assignment. Student who were absent in the class would be unaware of the physical assignment sheets provided by the teacher in the class. So, teacher would upload an electronic copy of that assignment. Those students who would have lost their physical assignment copy or might not submit their physical assignment in time, may upload an electronic copy of that assignment on the website. Then teacher would make an entry in the database for those students who would have submitted the assignment.
- Class work-If a student has to miss a class due to some reason, then this section will help him/her to come across the work that was held in the class. The teacher would upload classwork and this will be updated regularly by the respective subject teacher.

- Test Schedules and record of current class for internal assessment-This will inform the students about the upcoming class tests and the date assigned for those tests. Also, the track records of the students will be maintained under this section, which will be helpful for teachers to assign internal marks to students through the session. Test schedules will be uploaded and maintained by the subject teacher.

  At the time of final assessment, teacher would analyze the internal assessment list and submit it to the exam department which would be further uploaded and maintained on the website by the exam department itself.

- Attendance- An attendance record of all the students will

be maintained class wise so that the parents may be notified about their child if he is falling short of attendance. The attendance record will be submitted to the website management dept. by the teacher and the dept. will upload it. Another web application will automatically calculate attendance percentage and mark low attendance columns, so that student will know in which subject they have short attendance.

- Previous year papers- Class wise previous year papers will be uploaded, so that at the time of examination students can come to know about the pattern of the exam. This section will be maintained by the exam dept. and will be updated yearly.

- Exam Information- Under this section, students will get help in exam point of view. Such as:-

  - Class wise Datasheets- The datasheets will be uploaded on the website at the beginning of the session so that students may prepare accordingly. Later on the changes would be applicable. The date sheets decided by the exam dept. would be uploaded yearly and changes (if any) would be incorporated at the same time.

  - Score card- After the evaluation of the exam sheets, the final theory and practical score cards of the students will be submitted by the teacher to the exam dept. which in turn would maintain a record for the same and upload it to the website. With this data and the final assessment data, final score card of the students will be automatically generated and uploaded on the website by the exam dept.

  - Record Graph of Students in Previous Year Exams- The

previous year final examination score record of a student will be maintained, which would help the parents and teachers to analyze the performance of a student. With the record maintained above, a record graph of every student will be maintained and updated yearly by the exam dept.

- Time Table- Class wise time table will be uploaded and updates will be done online. The motive will be to inform the student about any changes as soon as possible. The teachers would submit time table to the website management dept. which will maintain and upload the necessary changes timely.

- Upcoming school events, fests and competitions-The students need to be informed about any kind of school events, fest celebration or competitions so that they may show up with proper preparations. For ex:- if an interschool debate competition is to be held, then every information regarding that competition need to reach the student in time, ex Topic of the debate, time limit, venue, no. of participant etc. . The website management dept. will yearly maintain and upload the notices regarding school events and fests as notified by the school in charge.

- Participation and certificates- This kind of record will be maintained about the students who actively or passively participate in any kind of event held in the school and contribute to the school. These kind of students need to be motivated and it is required to up bring their personality by rewarding them on special occasions like annual day celebrations etc. The certificates earned by the students would be given to the website management dept. firstly by the school in charge and then this department would make respective entries in the database.

- Books referred by institution-The students who would be interested in reading the books related to text apart from the reference

books will find this section very useful. This section will mention the books that may help regarding the context. The books that would be freely available by the publisher would also be provided in form of eBook. Teachers will inform the Website management dept. and they would maintain this section and update it if any change occurs in the current curriculum.

- Parent's notice-Parents do need to be informed about various topics. So, they may have a look at this section for such notices. Like the PTM meetings, or if the student has to pay some kind of fees or any other information that is useful and necessary, will be mentioned under this section. The class teacher will submit the parent's notices to website management dept. and they will upload the issued notices for the parents.

- Class wise feedback forms-This section is also important for if the students are facing problem to understand what the teacher is teaching , and they are unable to complain about him/her, then a teacher wise record of feedback forms would be maintained, so that school authority may look into the matter and resolve it. Students will fill the feedback form online and another web application will automatically calculate the feedback percentage, further website management dept. will upload the feedback percentage of the teachers in the feedback database, so that teacher may be evaluated.

❖ Non Functional Requirements

- PERFORMANCE
  - The system should process every query within 10-20 seconds.
  - The database should have sufficient amount of space to store large amount of dynamic data.
  - User should be able to upload a file of size 50K in less

than a second.
- Loading and refreshing the content should take approximately take 1-2 seconds.

- RELIABILITY AND ANALYSIS

  The user can rely on this application as long as:
  - He / She has an active internet connection.
  - He / She follow the user instructions provided for application to work correctly.

- SECURITY
  - Feedback process will be properly secured and authenticated with student login.
  - All the information regarding the scorecard as well as record graphs of the students and the uploaded documents will be secured.

- MAINTAINABILITY
  - The application will be designed in a maintainable manner.
  - It will be easy to incorporate new requirements in the individual modules.

- DATA TRANSFER
  - The customer's web browser shall never display a customer's password. It shall always be echoed with special characters representing typed characters.
  - The system's back-end servers shall never display a customer's password. The customer's password may be reset but never shown.
  - The system's back-end servers shall only be accessible to authenticated administrators like website management department.
  - The system's back-end databases shall be encrypted.

Feasibility study

The feasibility of the product is a question that conforms the reality to the ideas. Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of an existing business or proposed venture, opportunities and threats present in the environment, the resources required to carry through, and ultimately the prospects for success. The two criteria to judge feasibility are cost required and value to be attained. Some of the common feasibility factors are -: technical feasibility, economic feasibility and behavioural feasibility.

- **Technical feasibility**

  The end product is an application that requires inbuilt functions and libraries that are programming language specific. The software is workable on any mobile/pc having any operating system and a working internet connection.

- **Economic Feasibility**

  The cost incurred for the developing the software is much less as compared to the manpower employed for handling all the details manually. The cost of the software is the one long time investment for development and some short term investments for managing the website.

- **Behavioural Feasibility**

  Understanding the software is a very simplistic task here. Little special training is required by the user using the application as it is easy to deploy and use. The application is user friendly.

System specification–S/W and H/W requirements

❖ SOFTWARE INTERFACE

- Operating System : Every operating system, every browser
- Front end : HTML, CSS, Java Script
- Back-end : SQL database, PHP

❖ HARDWARE INTERFACE

- Processor: X86 Compatible processor with 1.7 GH Clock speed.
- RAM : 512 MB or more
- Hard disk : 20 GB or more
- Monitor : VGA/SVGA
- Keyboard : 104 Keys
  Mouse : 2 buttons/ 3 buttons

Software Design

❖ Process model

This software uses WATERFALL MODEL which is also known as linear sequential model: Software follows a sequential path, we cannot move back from current phase to the previous phase.

- The customer is completely aware of his requirement and thus, will not interfere in the making of the software much and there will be no need to update the SRS again and again
- Since, there will be lesser user intervention, the software will be made in time.
- Software Making Process will follow a sequential path, and hence, we cannot move back from current phase to the previous phase.

- **Data Dictionary**
  - Student Basic Info Database:
    Name + Father's Name + Address + Contact + Admission Number + Admission Year + Mode of Transport
  - Exam Database:
    Name + Admission Number + Final Scorecard + Final Record graph
  - Feedback Database:
    Teacher ID + Feedback (%) Class wise Database: Name + Class + Roll Number + Admission Number + Assignment Submission + Internal Assessment + Teacher ID
  - Analysis Database:
    Name + Admission Number + Fees + Attendance + Participation Record
  - Student Details (in DFD Level 1):
    Name + Father's Name + Address + Contact + Admission Number + Admission Year + Mode of Transport
  - Attendance Percentage (Process 5.2):
    (Attended classes by student * 100)/ (Total classes held)
  - Feedback Percentage (Process 1.3):
    (∑Marks given to teacher by student)/ (No. of students)*100

Project Management

❖ Computing FP

- Number of external inputs (EIs) - 14 (Student Info, E-Assignment , E-Classwork, Test Schedule, Internal Assessment, Previous Year Papers, Date sheet, Time Table, School Events, Certificate, Books Referred, Parent Notice, Feedback Form)

- Number of external outputs (EOs) - 14 (E-Assignment , E-Classwork, Test Schedule, Internal Assessment, Previous Year Papers, Date sheet, Time Table, School Events, Certificate, Books Referred, Parent Notice, Record Graph, Scorecard)
- Number of external inquiries (EQs) - 1

  (Theory and Practical Marks)

- Number of internal logical files (ILFs) - 5

  (Class wise Database, Feedback database, Exam database, Analysis database, Student Basic Info Database)

- Number of external interface files (EIFs) -0

Information Domain Value	Count		Weighting factor: Simple	Average	Complex		
External Inputs (EIs)	14	×	3	4	6	=	42
External Outputs (EOs)	14	×	4	5	7	=	56
External Inquiries (EQs)	1	×	3	4	6	=	3
Internal Logical Files (ILFs)	5	×	7	10	15	=	35
External Interface Files (EIFs)	0	×	5	7	10	=	0
Count total							136

UFP = 136

Fi: - Complexity

1. Does the system require reliable backup and recovery? 4

2. Are specialized data communications required to transfer information to or from the application? 3

3. Are there distributed processing functions? 2

4. Is performance critical? 2

5. Will the system run in an existing, heavily utilized operational environment? 3

6. Does the system require online data entry? 5

7. Does the online data entry require the input transaction to be built over multiple screens or operations? 3

8. Are the ILFs updated online? 4

9. Are the inputs, outputs, files, or inquiries complex? 2

10. Is the internal processing complex? 3

11. Is the code designed to be reusable? 4

12. Are conversion and installation included in the design? 2

13. Is the system designed for multiple installations in different organizations? 5

14. Is the application designed to facilitate change and ease of use by the user? 5

$\sum$fi = 47

CAF = 0.65 + 0.01*47

CAF = 1.12

$$FP = UFP * [0.65 + 0.01 * (\sum Fi)]$$

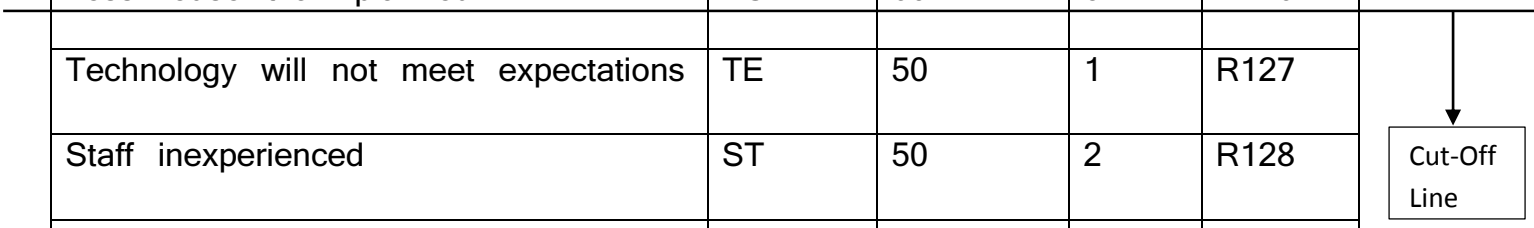
FP = 136 * 1.12 = 152. 32

❖ Effort and Size

From the data about FP computed by us and computed FP from previous projects of the same type, we can estimate the size of the project and effort (in terms of person hours) can be estimated.

❖ Risk Table

Risks	Category	Probability (%)	Impact	Risk Id
Lack of training on tools	TE	70	3	R123
Staff turnover will be high	ST	60	2	R124
Customer will change requirements	PS	60	2	R125
Less reuse than planned	PS	60	3	R126
Technology will not meet expectations	TE	50	1	R127
Staff inexperienced	ST	50	2	R128
Delivery deadline will be tightened	BU	50	2	R129
Larger number of users than planned	PS	50	4	R130
Funding will be lost	CU	40	1	R131
Size estimate may be significantly low	PS	40	2	R132



Impact:-

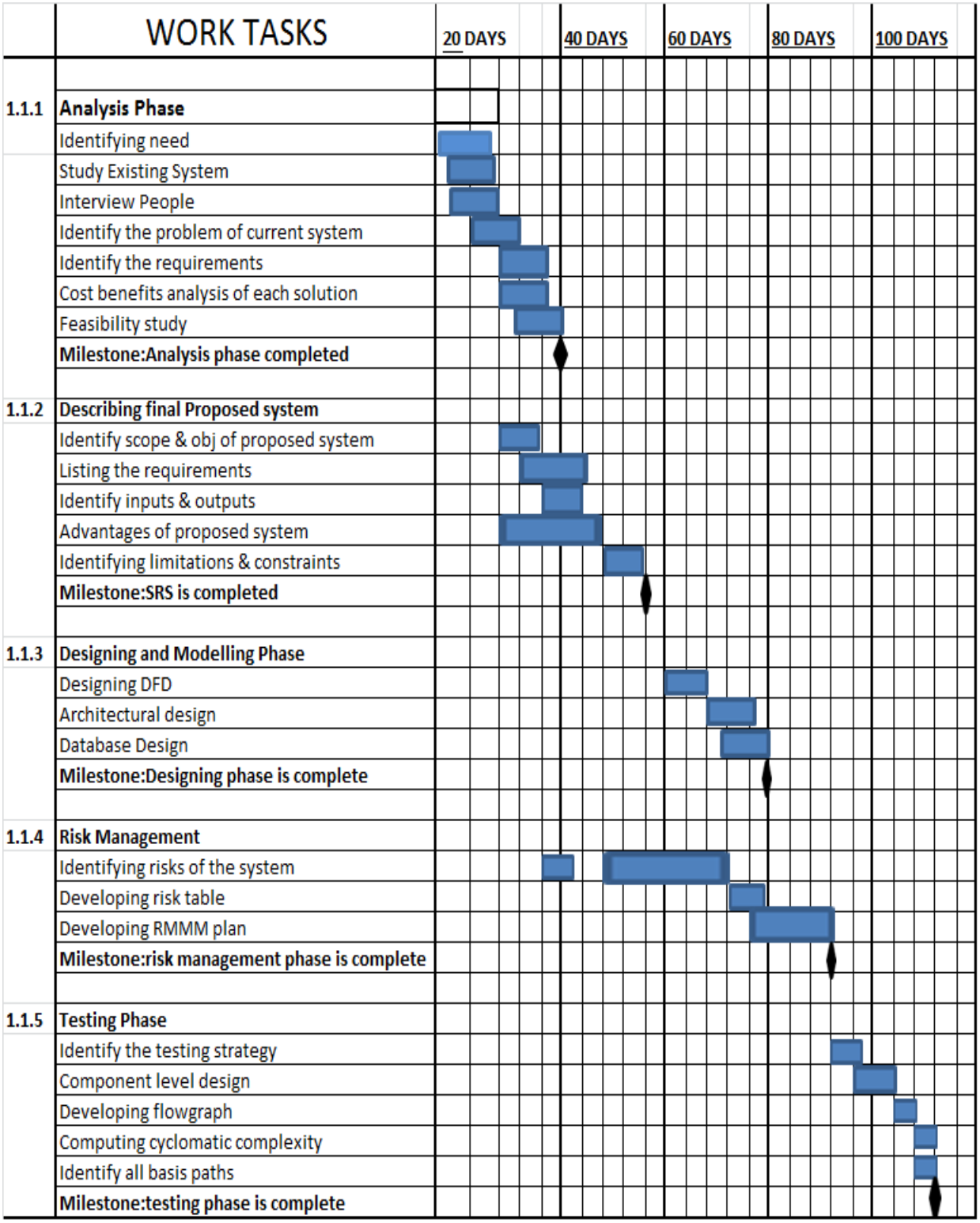
Category	Value
Catastrophic	1
Critical	2
Marginal	3
Negligible	4

Category:-

Category Name	Category
CU	Customer May Change Requirements
TE	Technological Risk
ST	Staff risk
BU	Business Risk
PS	Project Size Risk

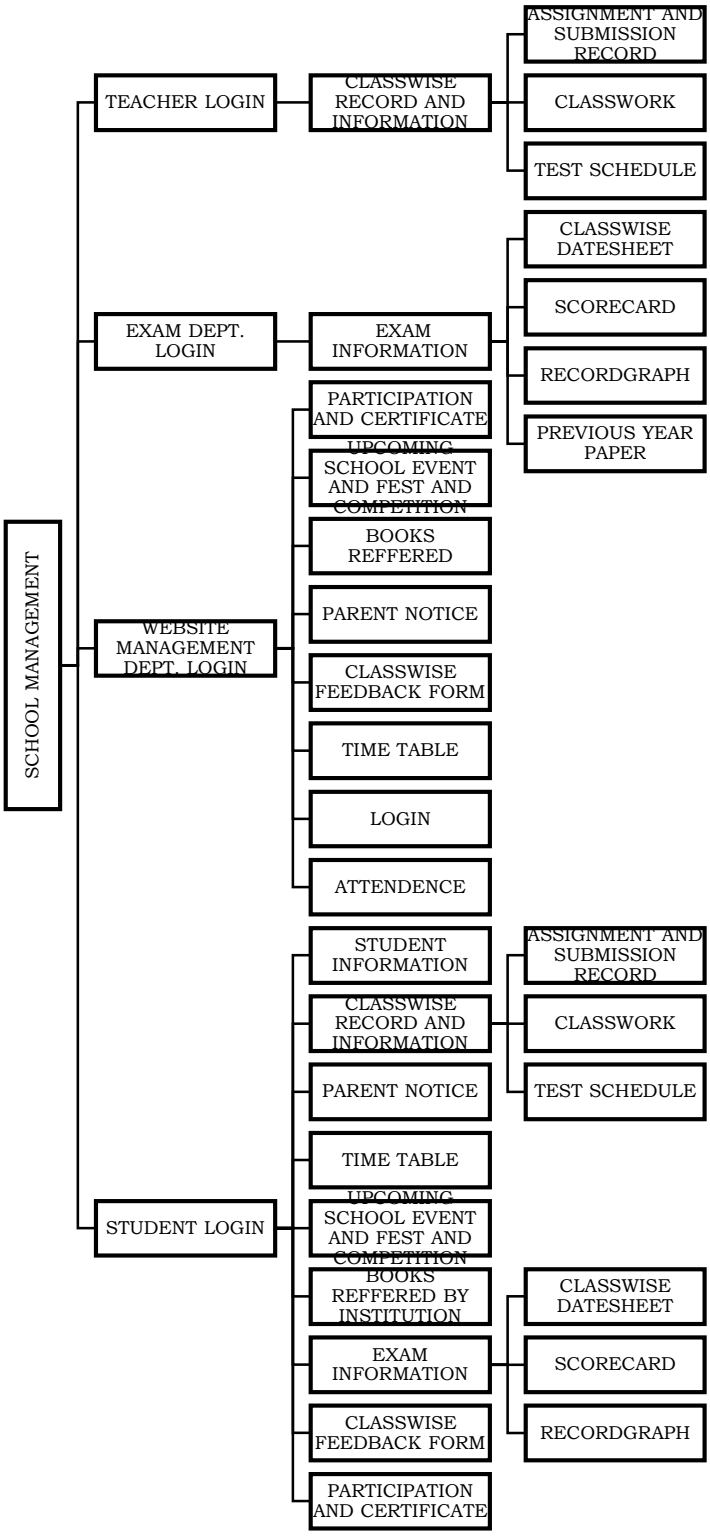
Risk Information Sheet			
Risk ID : R124	**Date** : 10/3/2015	**Probability**: 60%	**Impact** :critical
Risk: Less reuse than planned.			
Description: As a project progresses, issues that are not identified earlier can create a last-minute hurdle to meeting deadlines.			
Mitigation: At the beginning of the project, proper planning should be done such that it is possible to break the modules into simpler and simpler parts so that code for simpler modules can be reused for other modules too.			
Monitoring: While judging/viewing the project code, a counter can be applied to check the number of times a code can be reused.			
Management: If the risk occurs in reality, we would implement the backup code which would have been maintained from starting of the project which would not have any problem if code is reused less.			
Current Status: Mitigation in Progress			

❖ Timeline Chart



Design Engineering

❖ Architectural Design



❖ Data / Database Design

- Student Basic Info database (By School In charge)

Attribute Name	Type	Key	Default Value
Name	Character	-	NULL
Father's Name	Character	-	NULL
Address	Character	-	NULL
Contact	Integer		NULL
Admission Number	Integer	Primary Key	-
Admission Year	Integer	-	NULL
Mode of Transport	Character	-	NULL

Name	Father's Name	Address	Contact	Admission Number	Admission Year	Mode of Transport

- Class wise database(By Teacher)

Attribute Name	Type	Key	Default Value
Name	Character	-	NULL
Class	Integer	-	NULL
Roll Number	Integer	-	NULL
Admission Number	Integer	Primary Key	-
Assignment Submission	Character	-	NULL
Internal Assessment	Integer	-	NULL
Teacher ID	Integer	Foreign Key	-

Name	Class	Roll Number	Admission Number	Assignment Submission	Internal Assessment	Teacher ID

- Analysis database(By Website Management Department)

Attribute Name	Type	Key	Default Value
Name	Character	-	NULL
Admission Number	Integer	Primary Key	-
Fess	Integer	-	NULL
Attendance	Integer	-	NULL
Event	Character	-	NULL

Name	Admission Number	Fees	Attendance (%)	Event participation and rewards

- Exam database (By Exam Department)

Attribute Name	Type	Key	Default Value
Name	Character	-	NULL
Admission Number	Integer	Primary Key	-
Final Scorecard	Integer	-	NULL
Final Record Graph	Imgfile	-	NULL

Name	Admission Number	Final Scorecard	Final Record Graph

- Feedback database (By Website Management Department)

Attribute Name	Type	Key	Default Value
Teacher ID	Integer	Primary Key	-
Feedback (%)	Integer	-	NULL

Teacher ID	Feedback (%)

❖ Component Level Design-cohesion and coupling

- Coupling

Coupling between modules is the strength of interconnection between modules or a measure of interdependence among modules. Coupling increases with the complexity and obscurity of

the interface between modules. Complexity of interface is another factor affecting coupling. The more complex each interface is, the higher will be the degree of coupling.

For ex: - if we see in the architectural design, the atomic process/ modules like scorecard or recordgraph are least connected with each other. So we can say that lower the level of coupling, lower is the complexity.

- Cohesion

Cohesion of a module represents how tightly bound the internal elements of the module are to one another. The greater the cohesion of each module in the system, the lower the coupling between modules is.

For ex: - if we see feedback (%) calculation from feedback form, then we come to know that the module is greatly interconnected and no intervention from any other module is there. So we can judge that there is high level of cohesion and hence low level of coupling.

Testing

❖ Test Plan

- Two types of testing is used in testing the developed software:-
  - Black box testing

    In this testing functionality of a program is tested. The process of this testing involves observing the output depending upon certain input. No attempt is made to analyze the source code. The program is treated as a Black Box where input will be given and output will be received without observing the internal processing of the program.

  - White box testing

    White box testing of software is predicted on close examination of procedural detail. Providing test cases that exercise specific conditions or loops tests logical paths through the software.

- TESTING PROCEDURES

  There are three testing procedures that we use to test our software: -

  - UNIT TESTING: - This is the testing of an individual module and is usually carried out to ensure the validity of a particular module. It makes use of white box testing technique.

- INTEGRATED TESTING: - Integrated testing is the testing of the system modules. This is done to identify errors, which relate to the interaction of different module, which cannot be found by unit testing but only through an interactive testing. It makes use of black box testing technique.

- SYSTEM TESTING: - System testing is the testing of the system against its initial objectives. It is done either in a simulated environment or in a live environment.

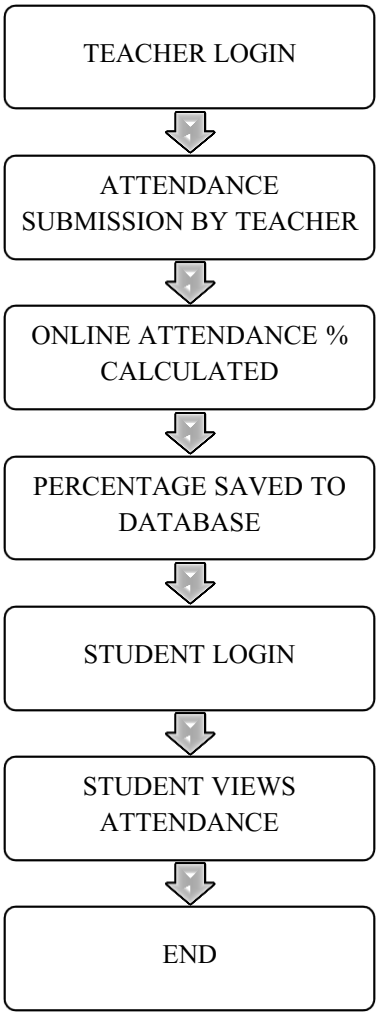
❖ Test Procedure Specification- Basis Path Testing

- Cyclomatic complexity

The value computed for cyclomatic complexity defines the number of independent paths in the basis set of a program and provide us with an upper bound for the number of test that must be conducted to ensure that all statements have been executed at least once.

❖ Flow chart

- Input Flow Chart

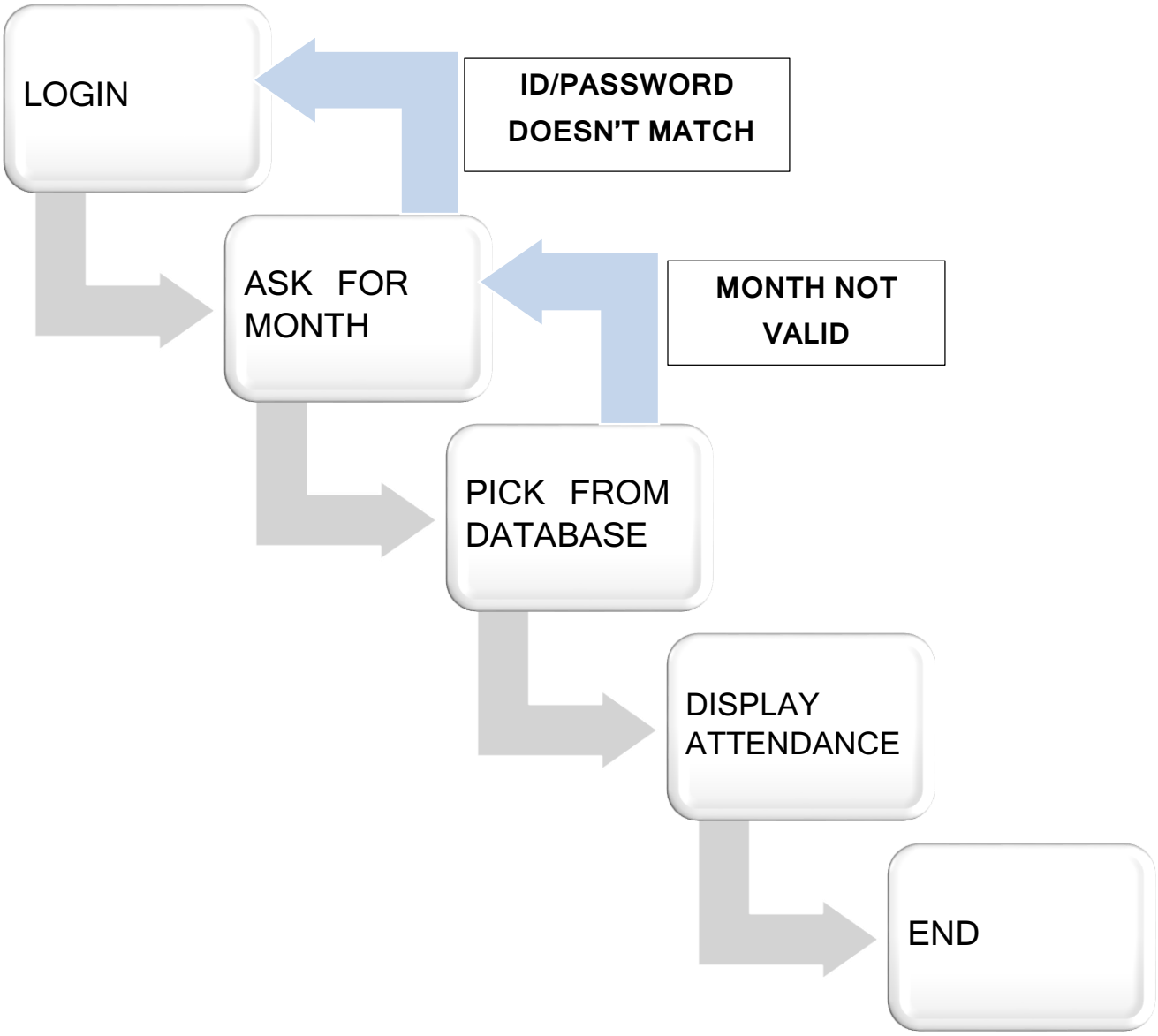


Input flowchart depicts the basic input operations in the system.

- Steps:-
  - "Teacher Login" details including Username and password.
  - Teacher submits monthly attendance.
  - Attendance % is being calculated online by a web application.
  - Student attendance percentage is saved to the database.
  - "Student Login" details including Username and password.

- Students check his/her attendance and exits from the interface.

- **OUTPUT FLOW CHART**



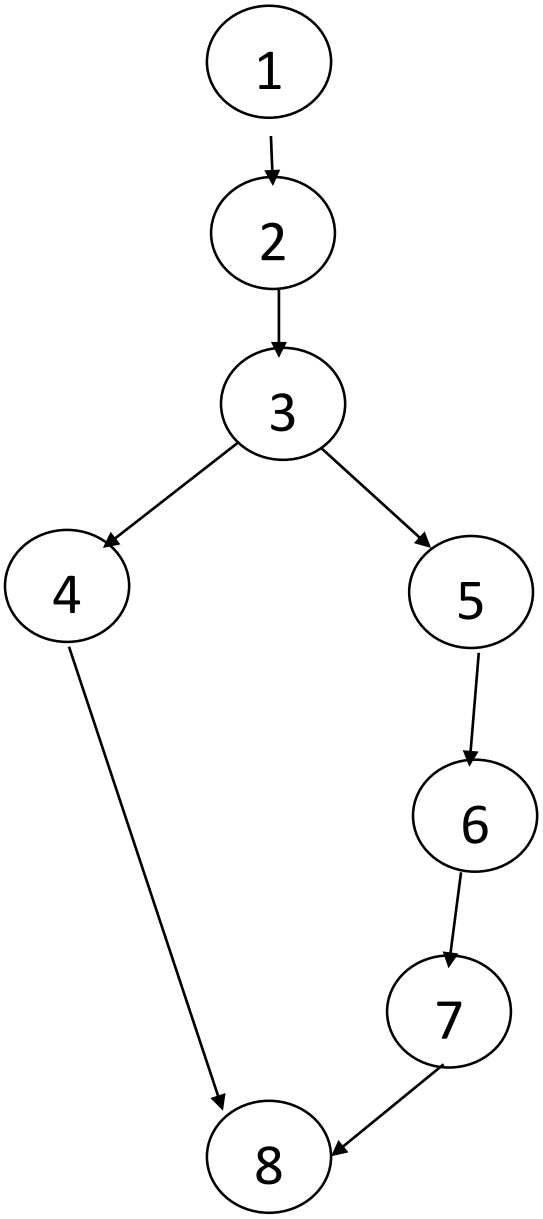
Output flowchart depicts the basic output operations in the system.

- Steps:-
  - The user is required to enter the his/her id and password if they matches then we move to next step
  - If user selects attendance then he need enter the month of whose attendance he/she wants to see.
  - If the entered month is valid then attendance of that month is picked from the database else it will again ask for the month.
  - After getting data from database it will be displayed to the user.
  - Program finishes.

- PSEUDOCODE (Code for calculating attendance %)

```
1. Total <- Total number of classes held
2. Attend <- Classes attended by student
3. If(total == 0)
4.         Print(”Error:- divide by zero “);
5. Else
6.         Percentage = (attended/ total)*100;
7.         Upload Percentage
8.   Exit
```

- Flow Graph



- Cyclomatic complexity

  No. of vertices = 8

  No. of edges = 8

  Cyclomatic complexity = edges - nodes + 2

  = 8 - 8 + 2

  = 2

  Total no. of independent paths = 2

- Independent paths:

  Path 1: 1 -> 2 -> 3 -> 4 -> 8

  Path 2: 1 -> 2 -> 3 -> 5 -> 6 -> 7 -> 8

❖ **Test case specification**

User requirements	**Case**	**Consequences**
Total classes held.	Total classes held=0	Division error.
Total classes held.	Total classes held<0	Invalid input(as total classes held cannot be less than 0.)
Total classes held.	Total classes held>0	Program runs correctly.
Classes attended.	Classes attended>total classes held	Invalid input(as attendance(%) cannot be greater than 100.)

Bibliography

❖ References

- http://en.wikipedia.org/wiki/Feasibility_study
- http://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database
- R.S. Pressman, Software Engineering: A Practitioner's Approach, McGraw-Hill, Ed 7, 2010.
- P. Jalote, An Integrated Approach to Software Engineering, Narosa Publishing House, Edition 3, 2011.