Project Plan

for

TimeTable Generator

Version 1.0

CS-08

Indian Institute of Information Technology Vadodara

Team Members

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Revision History

Name	Date	Reason For Changes	Version
Kirtika Singhal	8/09/2018	Initiate	1.0

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1. Introduction

1.1 Overview

This document contains the plan which our team will carry forward in each phase of the software development, give a tentative cost estimation and time constraints for the project.

1.2 Skills Required:

- Knowledge of programming language especially javascript.
- Knowledge of web-framework for front-end development - ReactJs.
- Grip over Material Design Convention and solid concepts over the design of UI/UX.
- Environment for back-end development -node.js.
- Familiarity with a cloud platform for deploying the project - Amazon Web Service(AWS).
- Experience in document-based Databases for storage - MongoDB.

1.3 Skill Level of Team Members:

- Aman Yadav: Back-end development, Documentation, Algorithms and data structures
- Dakshkumar Gondaliya: Front-end development, Documentation
- Kirtika Singhal: Front-end development, Documentation
- Mayank Pathela: Back-end development, Documentation
- Nikhil Sachan: Back-end and AWS deployment
- Parmeshwar Kumawat: Unit Testing and System Testing

1.4 Project Deliverables

The Project deliverables will be:

- Feasibility Analysis
- Project Plan

- Software Requirement Specifications
- System Test Plan
- Risk Management
- Testing Report
- Deployment Plan
- User Manual

1.5 Stakeholders

- Team Members
- Intermediate Level School Administration

1.6 Assumptions, Constraints and Risks

The software is designed to solve and generate school timetable. The following is a list of assumptions made:

1.6.1. Assumptions

1. We will collect information about the data needed to generate the timetable.
2. Teachers are assumed to be available all the time, i.e, no preference of time and day will be taken.
3. The complexity of the Algorithm we will design depends on the constraints and scope of the usability.
4. Classes are assumed to have enough capacities.
5. The number of classrooms and labs are assumed to be sufficient.

1.6.2 Constraints

There will be two types of constraints considered:

Hard Constraints

1. No faculty will be allocated two batches for different courses in the same time slot for the same day.

2. No Batch will be given two courses at the same times slot for the same day.

Soft Constraints

1. A Faculty won't have first class in the morning every day.
2. More than two sections can't have the same lab.

1.6.3   Risks

● Generating time-table is an NP-hard problem, therefore finding an optimal solution is not possible.
● It may also happen that no valid solution is generated due to lots of clashes. In that case, the best fit solution will be provided having clashes.
● The time of execution can be quite long like 3-5 minutes.

2. Goals and Scope

2.1 Goal

This project tries to find a solution to the school timetabling problem. The timetabling problem involves scheduling a number of tuples, each consisting of a class of students, a teacher, a subject, to a fixed number of time slots. A number of such tuples may be scheduled in the same time slot providing no class and a teacher appears more than once in the same time slot. Our client(Mahesh Gyan Mandir Senior Secondary School) does not have such software till now and creates time-table manually spending lots of hours. So, we are trying to reduce that work as much as possible within the given time constraints.

2.2 Scope

This software is developed by keeping the general constraints that any school have in preparing timetable. This can be used by any Educational Institute which satisfies our given hard and soft constraints.

3. Organization

3.1 Task Division

The roles and responsibilities have been divided among the team members considering each member's skills, interest and capabilities to ensure smooth and successful completion of the project. The project requires several new technologies and programming languages to be learned. The following is an elaborate distribution of work:

Name	Role	Activities
Aman Yadav	Team Member	Documentation, Algorithm designing and implementation
Dakshkumar Gondaliya	Team Member	Front-end Development, Documentation
Kirtika Singhal	Team Member	Front-end Development, Algorithm designing, Documentation
Mayank Pathela	Team Leader	Back-end Development, Algorithm designing, Documentation
Nikhil Sachan	Team Member	Algorithm designing, Documentation, Deployment
Parmeshwar	Team Member	Documentation, Testing

3.2 Schedule and Milestones

Serial No.	Milestones	Proposed Deadlines

1.	Finalize Project Idea	17 August 2018
2.	Feasibility Analysis	18 August 2018
3.	Plan the different Phases of our project and get the basic understanding of required skills	8 September 2018
4.	Designing Mock-Up and Algorithm	23 September 2018
5	Implementation of the Algorithm, UI designing, and Unit Testing.	21 October 2018
6	Final Testing	26 October 2018
7	Deployment	29 October 2018
8	Final Submission	31 October 2018

4. Cost Estimations

For a given set of requirements, it is desirable to know or estimate: How much it will cost to develop the software to satisfy the given requirements? How much time the development will take?

For determining the cost we are using basic *Constructive Cost Model(COCOMO)* which determines cost in terms of efforts expressed in person months. The total Lines of Codes in the project will be in the range of 5000-5500. By using these values in terms of KLOC and as our team members have a nominal experience regarding the problem which has been solved in the past by others, our project will be characterized as *Organic Model.* By using these values, the range of Effort and Development Time are calculated:

Effort = $a(KLOC)^b$, where a = 3.2 and b = 1.05
The Range of Efforts = 17.34 - 18.374 person months

Development Time = $c(Effort)^d$, where c = 2.5 and d = 0.38
The range of Development Time = 7.4 - 8 months

Schedule = Efforts/ Actual Team Size
Estimate of Schedule = 3 - 4 months

5. Software Development Lifecycle Model

We will follow the *Iterative Model* for our application.

Iterative Model: An iterative lifecycle model does not attempt to start with a full specification of requirements. Instead, development begins by specifying and implementing just part of the software, which can then be reviewed in order to identify further requirements and improving in each iteration. This process is then repeated, producing a new version of the software for each cycle of the model.

Diagram Of Iterative Model:
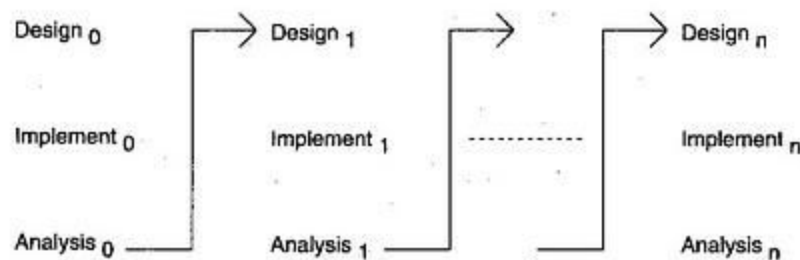
Why Iterative Model?
The main aim of the software is to give a valid time-table solution for school which can be done through the iterative model. We will design an algorithm and will keep improving it in terms of the time taken. Also for web design part we have fixed functionalities whose user interface we will keep improving with time to make it more user-friendly.

Advantages of the Iterative model:
- In the iterative model, we can only create a high-level design of the application before we actually begin to build the product and define the design solution for the entire product. Later on, we can design and built a skeleton version of that, and then evolve the design based on what had been built.
- In the iterative model, we are building and improving the product step by step. Hence we can track the defects at early stages. This avoids the downward flow of the defects.
- In the iterative model, we can get reliable user feedback. When presenting sketches and blueprints of the product to users for their feedback, we are effectively asking them to imagine how the product will work.

6. Communication and Reporting

The team will be discussing every problem they face in completing the task assigned to them and in understanding any part of the software development we will carry forward. We will have a meeting after the completion of the task assigned and discuss the next part that we would initiate. We will keep informing our progress to each other. Documentation of every meeting will be maintained so that if any member is not able to attend the meeting due to some reasons can walk through whatever we will discuss.

7. Project Monitoring and Quality Control

After every module is completed, unit testing will be done by team members in order to keep track of any error if occurred. After the final Merging and Completion of the coding part, we will take different test cases to verify that our software is working properly.

8. Evaluation

There will be four major stages of evaluation as the project progresses:

• The first evaluation will be done post the requirements phase. The evaluation will be done by the project manager [TA] and a representative of the client. During this evaluation process, the main objective will be to make sure that we have understood and addressed all the requirements of the client. After passing this evaluation process we will be able to advance to the next phase of the project i.e. Design phase.

• The second evaluation will be done post the design phase. The evaluation will be done by the project manager [TA] and a representative of the client. The objective of this evaluation will be to make sure that all the requirements of the clients as decided during the requirements phase are addressed in the design of the project. There should be no gaps between the designed and the desired aspects of the project, and the plans are made accordingly.

• The third evaluation will be done post Implementation phase, i.e. after the coding and unit testing, and the testing phase. The evaluation will be done by the team members. The main objective of this evaluation will be to make sure that everything that was decided upon in the design of the project is implemented in code and the final project is as expected and promised.

• The fourth and final evaluation will be carried out after the deployment of the final website. The evaluation will be done by the Professor. The main objective of this evaluation will be to verify that all the deliverables of the project as proposed in the proposal are met in the final product.