NANYANG TECHNOLOGICAL UNIVERSITY

LABORATORY MANUAL

SC3040 / CZ3002 : Advanced Software Engineering

2023~2024 Semester 1

Version 2.1.7

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
NANYANG TECHNOLOGICAL UNIVERSITY

Descriptions of Five Labs

Lab 1: Project Proposal and Project Requirements

1. OBJECTIVE

1) Form your team and establish your group members' roles and responsibilities.
2) Set up a MediaWiki site for group project, it will be used for collaborative work, e.g. sharing, updating knowledge.
3) Decide on what to build and write up the project proposal.

2. LABORATORY

This lab will be conducted in the Software Lab 3 (N4-B1C-14) in SCSE.

3. EQUIPMENT

PCs (Windows OS)

- MediaWiki
- Version Control System, e.g., Github

4. INTRODUCTION and SCOPE

In this first lab, the scope is for you to build your team and propose your own software development project for the module. Below, we give an introduction on the supporting software that you will have to make use of in all the follow labs. Get familiar with these supporting software in class. Your in-class discussions on team building and project to be proposed will be recorded in meeting minutes. You will continue to fix more details of your project proposal after class. Pay attention to the items that are to be delivered before the next lab in section 6.

4.1 Tools: Wiki

A **wiki** is software that allows users to create, edit, and **link** web pages easily. Wikis are often used to create **collaborative websites** and to power community websites. They are being installed by businesses to provide affordable and effective **Intranets** and for **Knowledge Management**. **Ward Cunningham**, developer of the first wiki, **WikiWikiWeb**, originally described it as "the simplest online database that could possibly work". One of the best known wikis is **Wikipedia**.

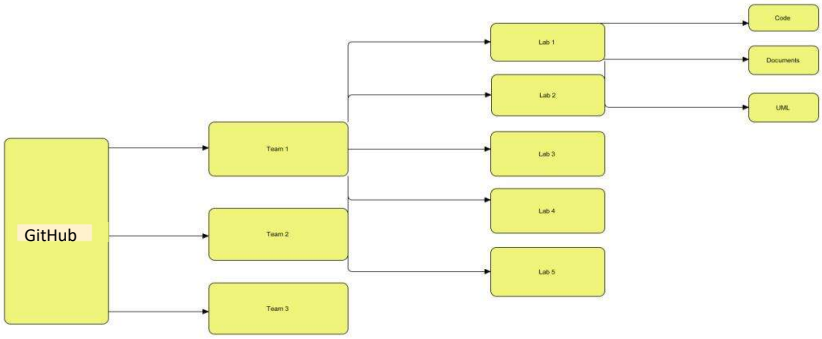
MediaWiki is **free** server -based software which is licensed under the **GNU General Public License** (GPL). It's designed to be run on a large server farm for a website that gets millions of hits per day. MediaWiki is

extremely powerful, scaleable software and a feature-rich wiki implementation, that uses **PHP** to process and display data stored in its **MySQL** database.

When a user submits an edit to a page, MediaWiki writes it to the database, but without deleting the previous versions of the page, thus allowing easy reverts in case of vandalism or spamming. MediaWiki can manage image and multimedia files, too, which are stored in the file system. For large wikis with lots of users, MediaWiki supports caching and can be easily coupled with Squid proxy server software.

4.2 Tools: Github

GitHub Desktop is an application that enables you to interact with GitHub using a GUI instead of the command line or a web browser. GitHub Desktop encourages you and your team to collaborate using best practices with Git and GitHub. You can use GitHub Desktop to complete most Git commands from your desktop with visual confirmation of changes. You can push to, pull from, and clone remote repositories with GitHub Desktop, and use collaborative tools such as attributing commits and creating pull requests.



4.3 Backlog

A backlog is a list of features or technical tasks which the team maintains and which, at a given moment, are known to be necessary and sufficient to complete a project or a release:

- if an item on the backlog does not contribute to the project's goal, it should be removed;
- on the other hand, if at any time a task or feature becomes known that is considered necessary to the project, it should be added to the backlog.

These "necessary and sufficient" properties are assessed relative to the team's state of knowledge at a particular moment; the backlog is expected to change throughout the project's duration as the team gains knowledge. The backlog is the primary point of entry for knowledge about requirements, and the single authoritative source defining the work to be done.

4.4 Meeting Minutes

Meeting minutes are the instant written record of a meeting. They typically describe the events of the meeting and may include a list of attendees, a statement of the issues considered by the participants, and related responses or decisions for the issues. In details, the meeting minutes should at least include the following items:

- Date, time, venue and duration
- Attendees and non-attendees
- Chair of the meeting being identified
- Check and approve the last meeting minutes
- Topics/issues being discussed
- Solutions/actions being decided
- Who should take what actions
- When should each action be finished
- The next meeting being planed
- The minutes should be agreed by all participants and signed by the chair
- The minutes will be reviewed/checked and approved in the next meeting

5. EXPERIMENT

5.1 Setup Project Team

1. Form a project team with 6-7 students per team. Lab supervisor may adjust the members of the teams based on the specific situation of the lab group.
2. Assign project team roles. Each member may take one or two roles in the list below.
    1) Project Manager (Overall delivery of product),
    2) QA Manager (Overall product and process quality, implementation of QA processes),
    3) QA Engineer (Devise test plans, conduct tests),
    4) Lead Developer (Overall technical lead, responsible for technical aspects of product release),
    5) Front-end Developer (Android front-end programming. Participate in the entire SDLC, generating work products including documentation, source code, unit and integration tests)
    6) Back-end Developer (Server, application and database programming. Participate in the entire SDLC, generating work products including documentation, source code, unit and integration tests)
    7) Release Engineer/Manager (Create baselines and build and integrate changes for delivery. Manage releases of the product prototype.)
3. Register your team online so that the lab technicians will setup lab environment including access right to Wiki and Github accordingly.
4. Please finish the first 3 steps in the first half of the session so that you have time to discuss the project and the project proposal in the team.

5.2 Hold the team meeting and complete the meeting minutes

In the meeting, the deliverables of this lab are discussed. Tasks and deadlines are identified and the tasks should be assigned. By end of the lab session, the minutes should be shown to the lab supervisor and submitted to the Wiki (for the first lab, if the Wiki access is not ready yet, the minutes should be submitted after the access is assigned but the minutes must be assessed by the lab supervisor). In the minutes, the preliminary idea of the system should be addressed and the system architecture should be described.

5.3 Setup Development Platform

1. Identify development platform and runtime platform (if different from the development platform) based on the project proposal
2. Check availability of the required software
3. Install the required software

5.4 Update the wiki page

Different from traditional web pages, only web host is able to modify the webpage contents. Wiki provides a flexible way that all registered users can modify the web contents in a direct way.

By clicking the “Edit” tab at the top of page, you are able to modify the whole page, or by clicking the “Edit” in every paragraph, you are able to modify a single paragraph.

For all the editing issues, please check the help content at [**http://www.mediawiki.org/wiki/Help:Contents**].

Please find the answers for the following questions:
1. how to make headings with different levels
2. how to make italic and bold fonts
3. how to add an image

5.5 Write Project Proposal

Project proposal is a document that is submitted to a business customer or an orginazation for acceptance and approval. The proposal describes the problem to be solved and explains the resulting benefits to the customer or the public.

A use case model (including use case diagram and accompanying use case description) can help you to identify the features and functionalities included in your proposed system.

In addition, innovative ideas that make your system different from existing similar systems, data collection mechanisms and data analysis using the collected data are encouraged to be included in your proposed system.

5.6 Update the backlog excel file

The backlog excel file of the team should be used and updated according to the task assignment and progress of each lab.

6. DELIVERABLES

The following items should be delivered by the end of the in-class lab session:

1. Team registration at the lab computer system
2. Meeting minutes of the in-class discussion

Have the following ready (hosted/uploaded/compiled) by the next lab session:

3. Wiki: Team Information (names, roles, emails, phone numbers)
4. Wiki: Project proposal
5. Wiki: Use case model
6. Wiki: Backlog
7. Wiki: Meeting minutes

7. REFERENCES

[1] MediaWiki: **http://www.mediawiki.org/wiki/MediaWiki**
[2] Github: https://docs.github.com/en/desktop/installing-and-configuring-github-desktop/overview/getting-started-with-github-desktop
[3] Backlog: http://guide.agilealliance.org/guide/backlog.html