Web Application to Manage and Improve Software Development Projects by SEMAT Essence

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Abstract

- Using SEMAT Essence, developers can track the progress and health of a project.

- OCMS(Online Checklist Management System) is a tool to trace the progress of a project based on SEMAT Essence.

- We evaluate the OCMS in the experiments of student software development project.

Introduction-SEMAT Essence

SEMAT Essence

Customer

Opportunity

1. Identified
2. Solution Needed
3. Value Established
4. Viable
5. Addressed
6. Benefit Accrued
   - Operational use creating tangible benefits
   - Return on investment profile at least as good as anticipated

Progress

Stakeholders

1. Recognized
2. Represented
3. Involved
4. In Agreement
5. Satisfied for Deployment
6. Satisfied in Use

Check items to identify whether the state is completed or not.

Solution

Requirements

Software System

Endeavor

Team

Work

Way of Working

Example of using SEMAT Essence

Ex)Stakeholders reach Represented
Opportunity reach Value Established

Ex)Stakeholders reach Satisfied for Deployment
Opportunity reach Addressed

Project kickoff   Developing   Project closing

- Are stakeholders clear?
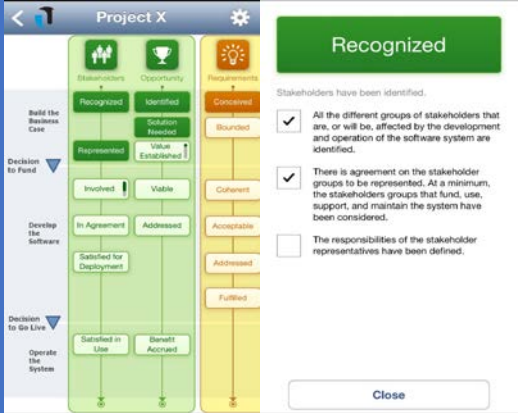- Is the issue clear?
- Is the team member ready?

- Is the implementation satisfying the requirement?
- Is the work of the members going well?

- Are stakeholders satisfying?
- Is the system properly operated?

Project Manager

Background- Existing Tools Analysis

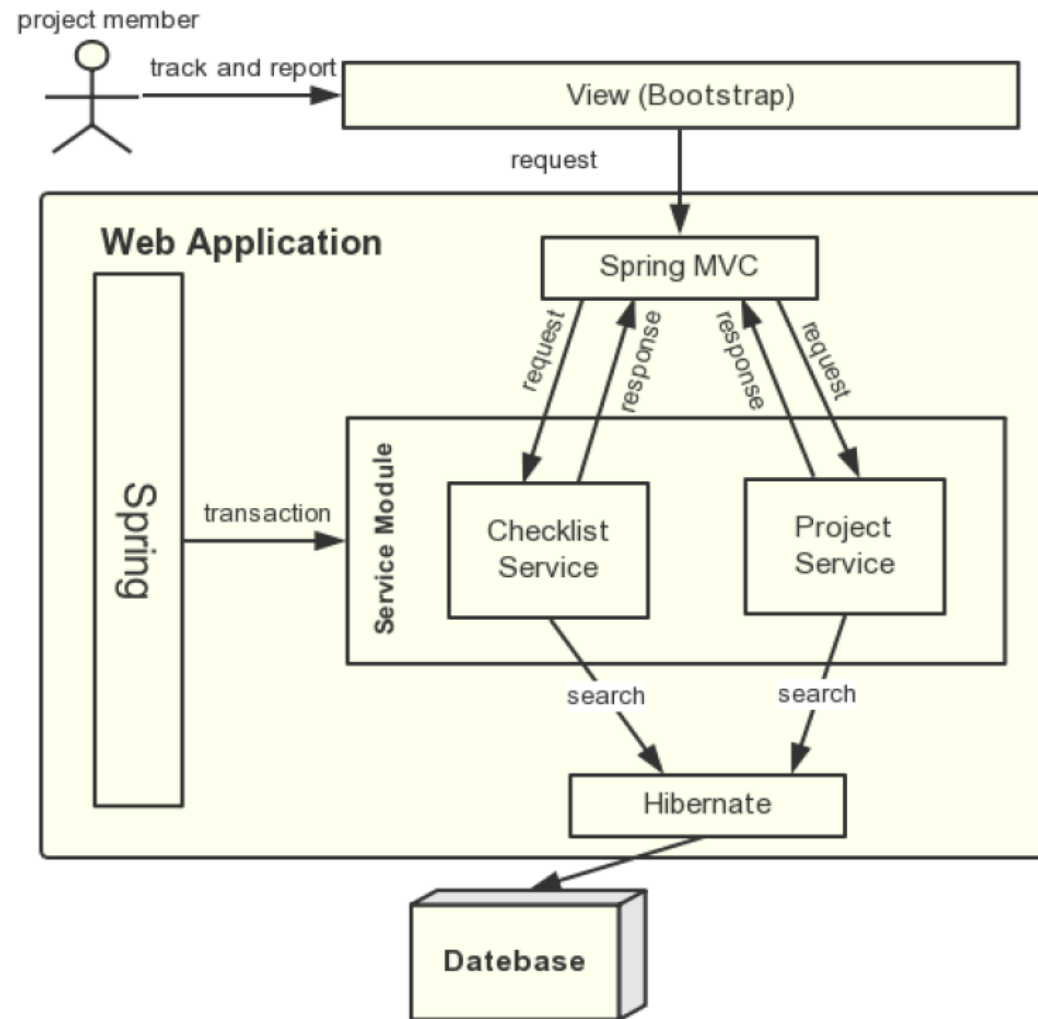|	EssWork Practice Workbench	SEMAT Accelerator	Alpha State Explorer
What can do?	• Customizing SEMAT Essence	• Saving the status of alpha or states • Working on the internet	• Saving the status of alpha, states and check items
What can't do?	• Saving the status of SEMAT Essence	• Saving the status of check items	• Only use on the iPhone or iPad
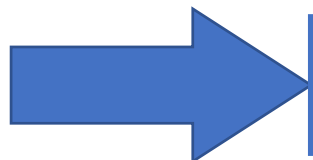
When we use SEMAT Essence in a software project, a useful single tool does not exist.
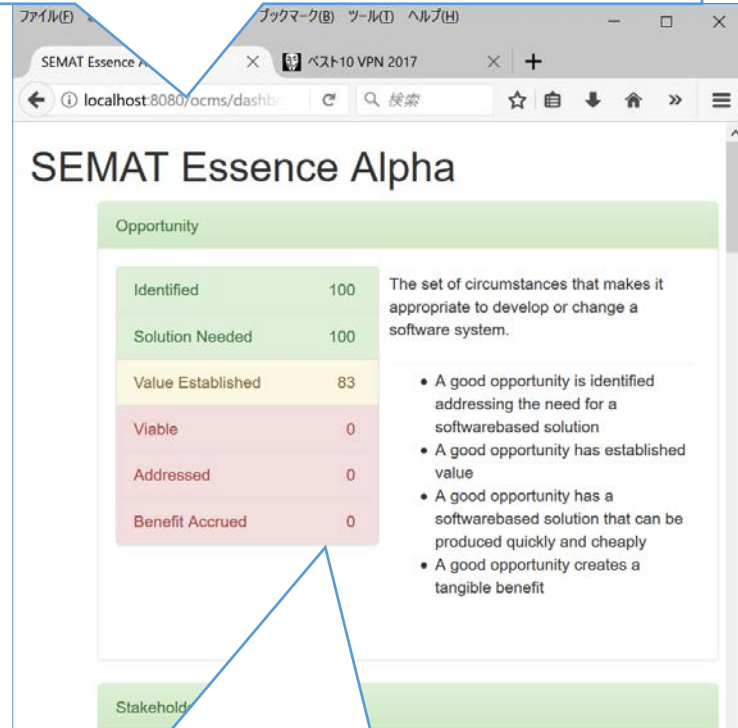
Proposal

We set five requirements
- OCMS should be applicable to diverse environments.

- The results of SEMAT Essence should be shared rapidly.

- Alphas and states should be customizable.

- Each project should save its own SEMAT Essence results.

- OCMS should be extendable with other checklists.

OCMS Architecture Overview

OCMS Dashboard screen

Previous Sprint
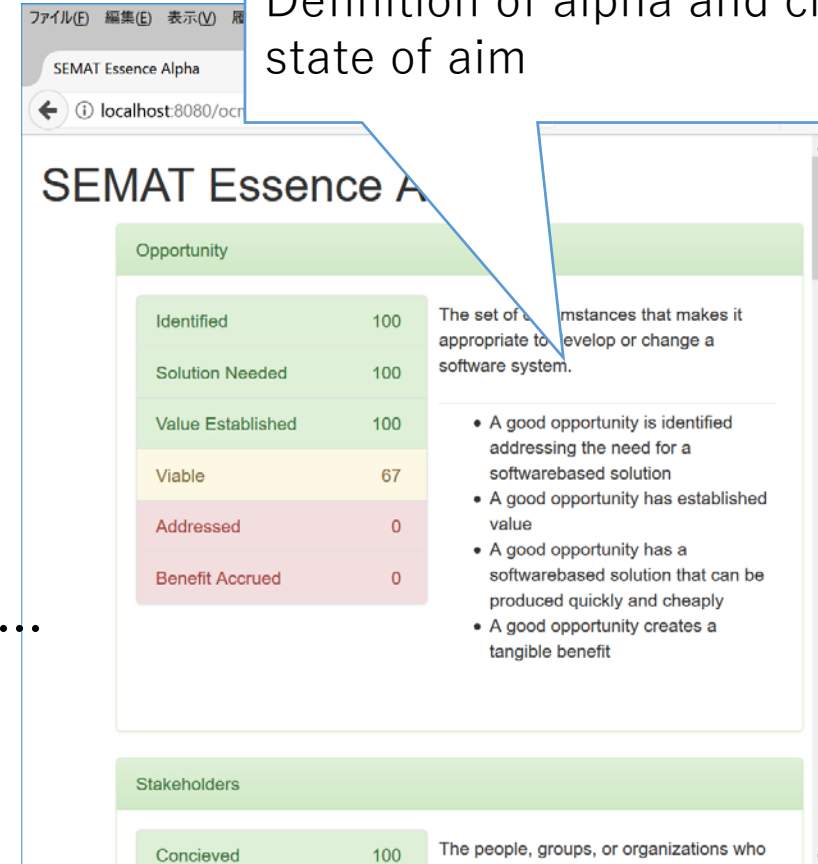
Next Sprint

OCMS Check screen

Tool Demo

Evaluation and Experiment

- **<u>RQ1:</u>**
  Does OCMS effectively improve a development?

- **<u>RQ2:</u>**
  Does OCMS suggested make SEMAT Essence easier to use?

Experiment Target

ET Robot contest Team
- Four students
- Develop software systems

Experiment has four steps:
1. Introduce SEMAT Essence, OCMS and experiment
2. Answer the Before Questionnaire(BQ)
3. Save the status of project by using OCMS each week for a month
4. Answer the After Questionnaire(AQ)

Questionnaire

- BQ1~6 asked their current status of the project for each area of concern

- AQ1~6 asked the effectiveness of the improvement (compared with BQ1~6)

- AQ7 and 8 asked the feeling of use of OCMS

- Each questionnaire is answered on a four-point scale.

Results

- RQ1:Does OCMS effectively improve a development?
  - ➢Student thought their project was improved(BQ1~6,AQ1~6)
- RQ2:Does OCMS suggested make SEMAT Essence easier to use?
  - ➢OCMS made it easier to use SEMAT Essence(AQ7,8)
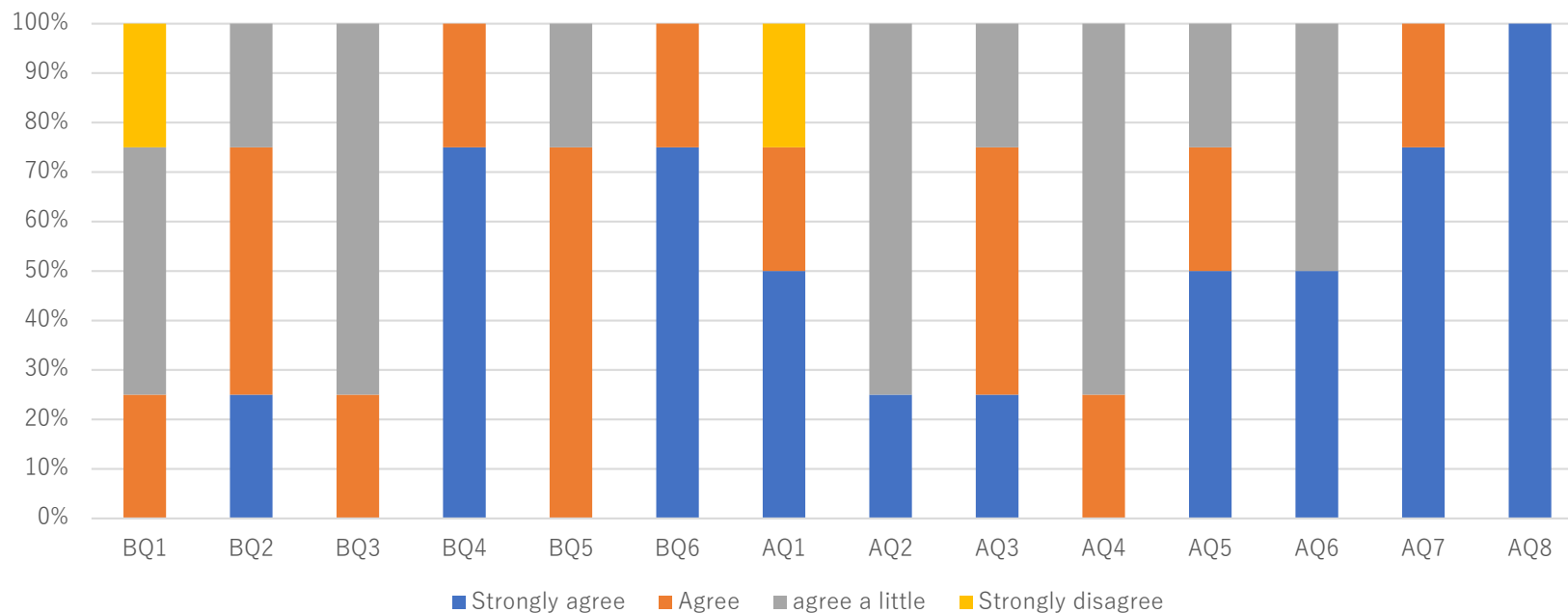
Conclusion and Future Work

- **Conclusion**
  - ➢ SEMAT Essence can track the progress of project

  - ➢ We developed a tool called OCMS to make SEMAT Essence more useful

  - ➢ The experiment reveals that OCMS have some effective for software development.
- **Future Work**
  - ➢ OCMS should be implemented other functions to be more user-friendly

  - ➢ OCMS also should collaborate other methods