

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



Progress

Stakeholders

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

- Operational use creating tangible benefits
- Return on investment profile at least as good as anticipated

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?



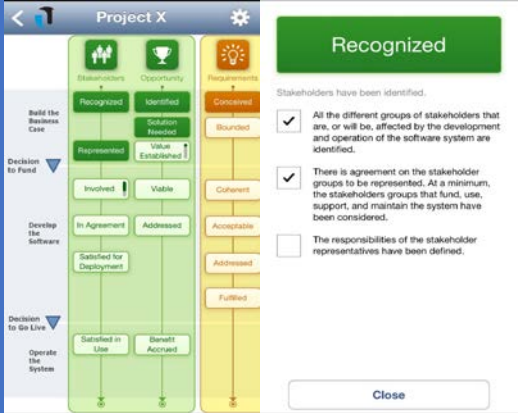
- Is the implementation satisfying the requirement?
- Is the work of the members going well?

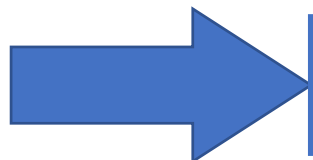
- Are stakeholders satisfying?
- Is the system properly operated?



Project Manager

Background- Existing Tools Analysis

	<h2>EssWork Practice Workbench</h2> 	<h2>SEMAT Accelerator</h2> 	<h2>Alpha State Explorer</h2> 
<p>What can do?</p>	<ul style="list-style-type: none"> • Customizing SEMAT Essence 	<ul style="list-style-type: none"> • Saving the status of alpha or states • Working on the internet 	<ul style="list-style-type: none"> • Saving the status of alpha, states and check items
<p>What can't do?</p>	<ul style="list-style-type: none"> • Saving the status of SEMAT Essence 	<ul style="list-style-type: none"> • Saving the status of check items 	<ul style="list-style-type: none"> • Only use on the iPhone or iPad



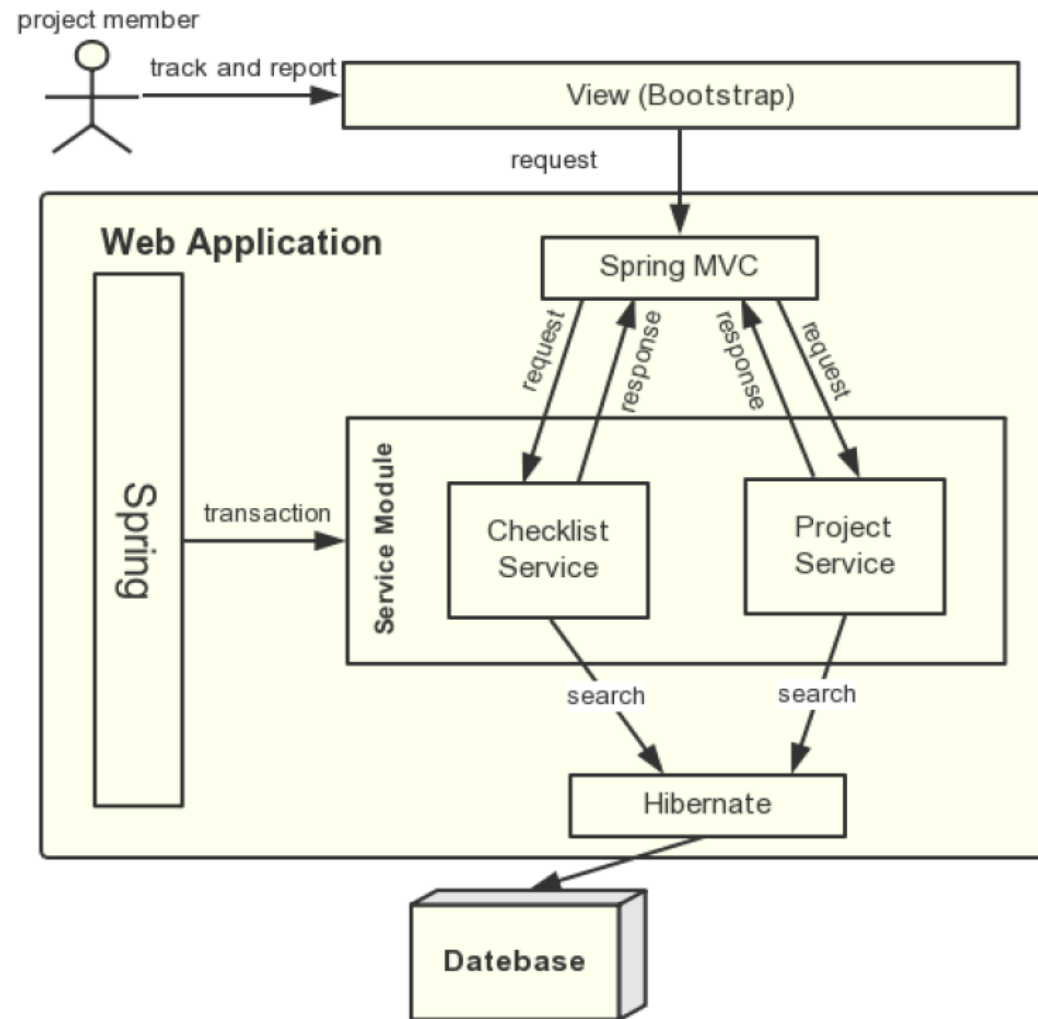
When we use SEMAT Essence in a software project, a useful single tool does not exist.

Proposal

We set five requirements

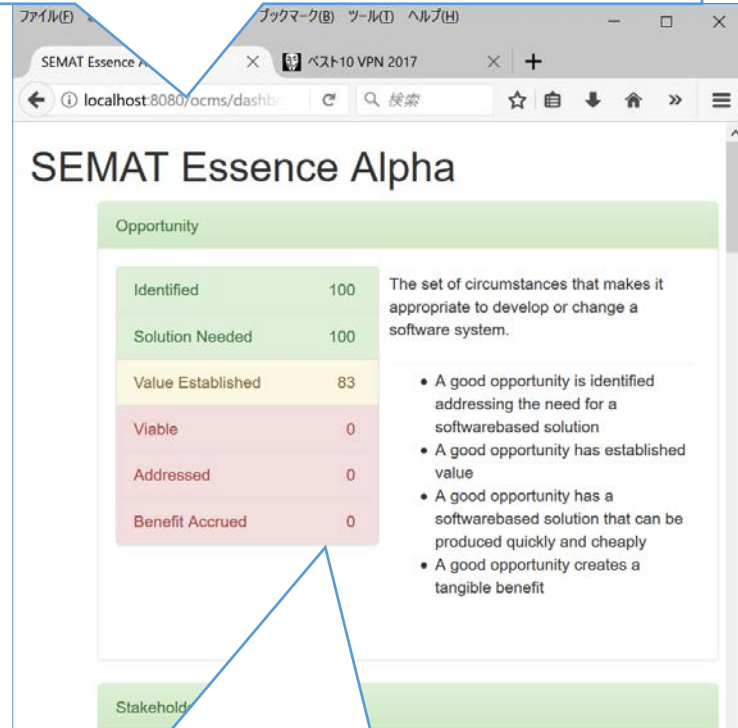
- OCMS should be applicable to diverse environments.
- The results of SEMAT Essence should be shared rapidly.
- Alphas and states should be customizable.
- Each project should save its own SEMAT Essence results.
- OCMS should be extendable with other checklists.

OCMS Architecture Overview



OCMS Dashboard screen

A Web application that can be used anytime anywhere



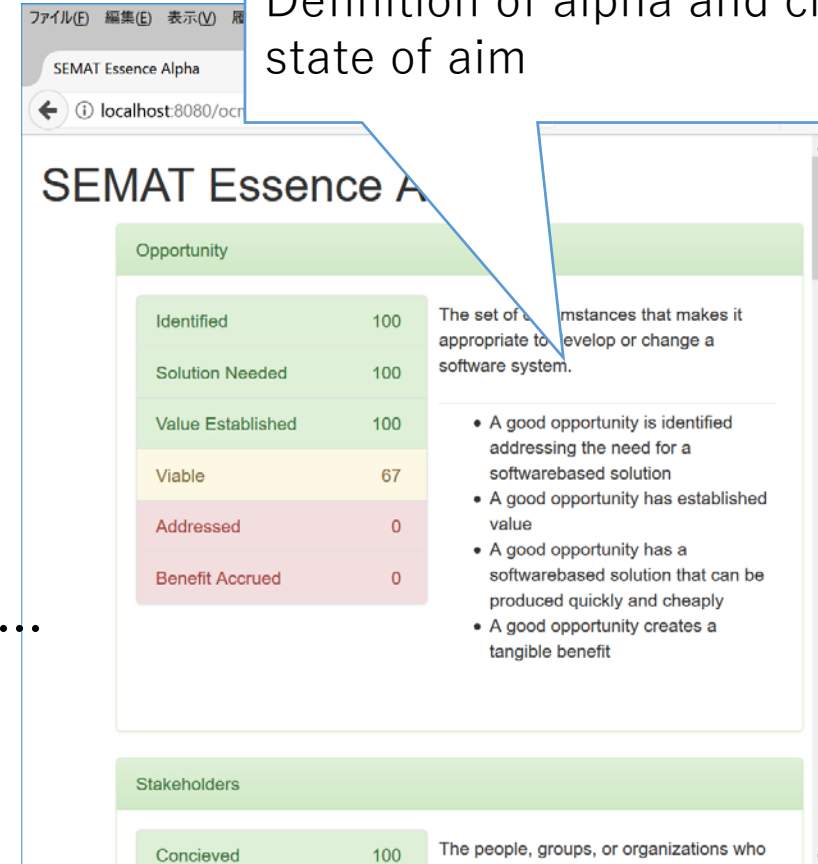
A dashboard that shows the status of each alpha at a glance

Previous Sprint



Project progress...

Definition of alpha and clear state of aim



Next Sprint

OCMS Check screen

Supplementary explanation of deliverable etc. necessary for item achievement

Various statuses not limited to achievement or not achieved

Save alpha status to database

Display from alpha or region of interest to which it belongs

Why the item can be said its status, its judgment basis

Achievement display showing the status progress at a glance

Area of Concern Alpha		State	Reach Rate	Check Item	Explanation	Status	Comments
		Identified	100	Opportunity identified that could be addressed by a software-based solution		Finished	We are able to share the task of "CS competition entry" within the team
		Identified	100	A stakeholder wishes to make an investment in better understanding potential value		Not Covered	
		Identified	100	Other stakeholders who share opportunity identified		Not Started	
Customer	機会			Need for software-based solution		Finished	Request definition
Customer	機会			Stakeholders needs identified		Finished	
Customer	機会	4/19	100	Underlying problem and root causes		Finished	
Customer	機会			At least 1 software-based solution		Finished	

Tool Demo

Evaluation and Experiment

- **RQ1:**
Does OCMS effectively improve a development?
- **RQ2:**
Does OCMS suggested make SEMAT Essence easier to use?

Experiment Target

ET Robot contest Team

- Four students
- Develop software systems

Experiment has four steps:

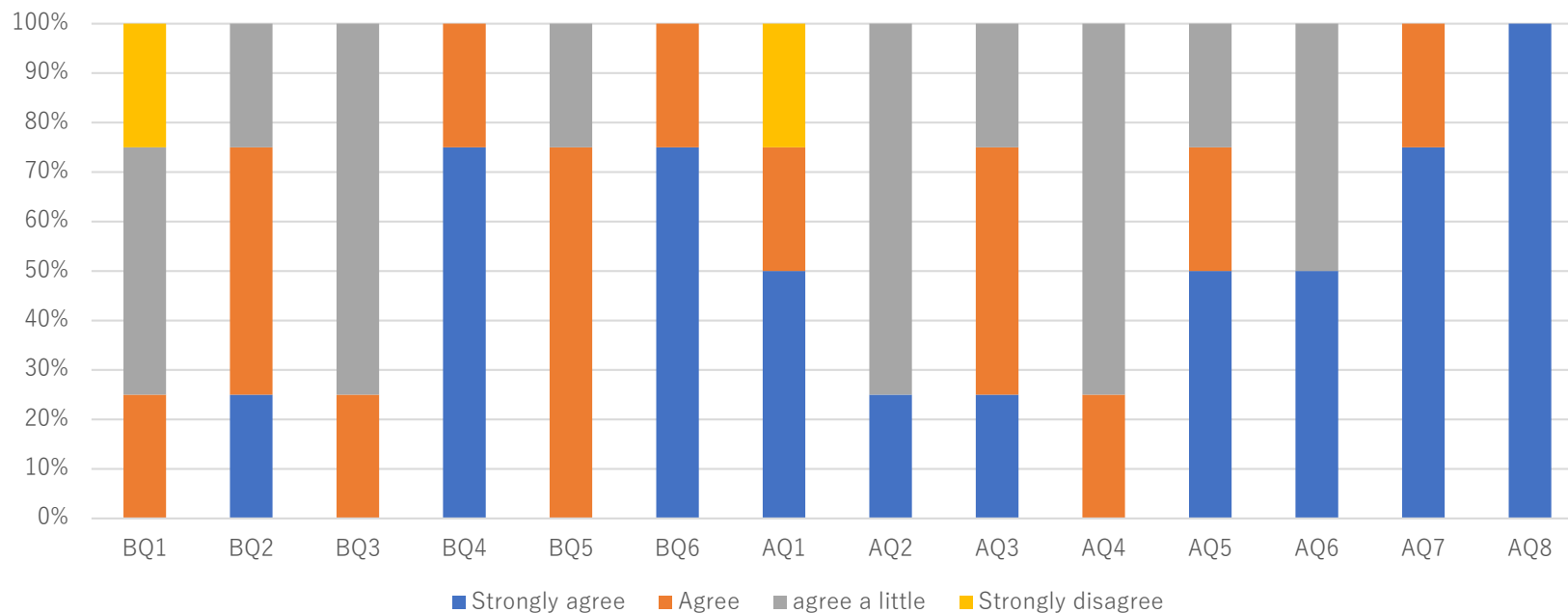
1. Introduce SEMAT Essence, OCMS and experiment
2. Answer the Before Questionnaire(BQ)
3. Save the status of project by using OCMS each week for a month
4. Answer the After Questionnaire(AQ)

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