Reflection and Traceability Report on Software Engineering: Alkalytics

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1 Changes in Response to Feedback

This section summarizes the feedback received on various documents throughout the course of the project as well as feedback on the product itself.

This information is summarized in tables, with a summary of the feedback in one column, the source of the feedback in the next column, the change made in response to the feedback in the third column, and a link to the issue in the last column.

For documentation related sections, each item of feedback has a link to the issue that addresses the change wih a link to the specific commit. For feedback and changes related to code, specific commits or issue links are not provided.

1.1 Problem Statement and Goals, Development Plan Documentation

Table 1 summarizes all feedback received on the Problem Statement and Goals and Development Plan documents and the changes made in response to the feedback.

Summary of Feedback	Source	Summary of Change	Issue Link
Development Plan lists software without describing or justifying their use.	TA	Added justification for the software used in the development plan.	Issue 146
Unclear what the product does from the problem description. Start with the problem and state what you will do to fix it.	TA	Added more detail about the problem and what the product would do to solve it.	Issue 147
Team charter should have quantifiable goals for, e.g. meeting attendance, etc, and describe ways you will remediate or discipline if necessary.	TA	Added quantifiable metrics and detailed remediation method and potential disciplinary action.	Issue 148

Table 1: Feedback and Changes Made for Problem Statement and Goals, Development Plan Documentation

1.2 SRS Documentation

Tables 2 and 3 summarizes all feedback received on the SRS document and the changes made in response to that feedback.

Summary of Feedback	Source	Summary of Change	Issue Link
Should not have figures without referring to it and explaining it in the document.	TA	Added references to all figures.	Issue 149
Use symbolic parameters all listed in a certain section instead of "magic numbers".	TA	Added section for symbolic parameters	Issue 149
Small grammar/spelling errors	TA	Fixed grammar/spelling errors	Issue 150
Diagrams should be PDFs.	TA	Changed diagrams to PDFs	Issue 150
Instead of saying "traceability" say something more descriptive, like "related requirements".	TA	Reworded to use "related requirements"	Issue 151
Must check all requirements and assess them for verifiability.	TA	Added verifiability assessment for all requirements.	Issue 152
Priority and date on the same line is confusing. Try to make it a bit clearer.	TA	Separated priority and phase-in date into two distinct fields.	Issue 153
Data privacy requirements for research data? Or general laws/privacy standards for web applications?	TA	Added more detail about data privacy requirements and web application standards.	Issue 154
No formalized part of the document.	TA	Added formalization for validation	Issue 155
Maintenance Requirements: Will there be training and continuity consideration in addition to documentation for my lab and other users?	Dr. de Lannoy	Rephrased maintenance requirements for clarity	No issue link available.

Table 2: Feedback and Changes Made for SRS Documentation, Part 1

Summary of Feedback	Source	Summary of Change	Issue Link
Missing stakeholder: Developers/Testers are considered other stakeholders	Team 1	No changes made. Refer to issue comments for justification.	Issue 88
Missing customer: For in house development the customer and client are often the same person. In this case, the initial customer would be the client.	Team 1	Identified client as a customer	Issue 89
Missing business process models: Lack of business process models as suggested in the volere template guidance.	Team 1	No changes made. Refer to issue comments for justification.	Issue 90
Inconsistency between UHR requirements: Should be specifying same percentage of users	Team 1	Changed UHR-1 percentage to 85% to ensure consistency with UHR-4.	Issue 91
OER-5 not verifiable	Team 1	Added testing percentage metric for verifiability	Issue 92
Inputs and outputs missing in use case diagram	Team 1	No changes made. Refer to issue comments for justification.	Issue 93

Table 3: Feedback and Changes Made for SRS Documentation, Part 2

1.3 Hazard Analysis Documentation

Table 4 summarizes all feedback received on the Hazard Analysis document and the changes made in response to that feedback.

Received Feedback	Source	Summary of Change	Issue Link
Table doesn't have title or reference in the body of the document.	TA	Added title and reference to the table.	Issue 156
Scope of what's being considered in the hazard analysis isn't clear.	TA	Clarified scope	Issue 157
Be more specific with some. E.g. H2-2, what exactly happens if it does fail halfway through?	TA	All requirements re-reviewed and made more specific	Issue 158
Critical Assumption could be a failure mode	Team 1	Removed the critical assumption	Issue 106, Issue 108
Inconsistency between FMEA and assumptions: Assumes internet connection will be available, but "network issues, server downtime" listed as cause of failure.	Team 1	Modified critical assumption to only consider local server infrastructure.	Issue 107, Issue 110
Inconsistency between assumption and requirement: Assumes system will have enough resources, but SR-17 states there must be monitoring and optimization to prevent crashes from too many resources being used.	Team 1	Removed assumption.	Issue 109
Authentication effect of failure is unclear: Should clarify what "loss of productivity" exactly means	Team 1	Clarified loss of productivity is for users	Issue 111

Table 4: Feedback and Changes Made for Hazard Analysis Documentation

1.4 Design Documentation

Tables 5 and 6 summarizes all feedback received on the Design document and the changes made in response to that feedback.

Received Feedback	Source	Summary of Change	Issue Link
AC5 and UC1 seem to be contradictory to one another.	TA	Removed	Issue 250
Change project name and provide description in abbreviations table	TA	X	Issue 251
Use PDF figures.	TA	Changed figures to PDF	Issue 251
List possible exceptions for each method in syntax table. Environment vars should be actual vars (with names) that represent things like the local filesystem and should be used by the semantics.	TA	X	Issue 252
Data validation module: should be, e.g. "output := MIN VOLTAGE $\leq$ v $\leq$ MAX VOLTAGE", no need for words.	TA	X	Issue 252
Output and exceptions are different, should be their own bullet points. Different modules are using different formatting. "Output" labels are completely omitted in the data validation module.	TA	X	Issue 253
More general validations you may need to do, like if something is the right datatype, format, etc. This module could be more generic.	TA	X	Issue 254
Limitations hould be more specific and detailed. Focus on se principles (encapsulation, information hiding, modularity, etc)	TA	X	Issue 255

Table 5: Feedback and Changes Made for Design Documentation

Received Feedback	Source	Summary of Change	Issue Link
Exported Constants Implementation not very clear	Team 1	X	Issue 173
Unnecessary state variable	Team 1	X	Issue 174
Consider defining types for access routines	Team 1	X	Issue 176
Inconsistent outputs in UI Module	Team 1	X	Issue 177
Inconsistencies between anticipated change descriptions and traceability matrix	Team 1	X	Issue 178

Table 6: Feedback and Changes Made for Design Documentation

1.5 VnV Plan and Report Documentation

Table 7 summarizes all feedback received on the VnV Plan document and the changes made in response to that feedback, Table 8 does the same for the VnV Report document.

Received Feedback	Source	Summary of Change	Issue Link
Sentence structure/flow problems, reference tables.	TA	Fixed sentence structure and added references to tables.	Issue 246
System tests should be more specific about what kinds of errors you will detect.	TA	X	Issue 247
Not clear how survey data will be collected and analyzed for validation.	TA	Clarified structure for survey data and how it would validate	Issue 248
Include traceability inside the tests instead of outside. Tests should be made more granular.	TA	X	Issue 249
Change traceability table to a matrix.	TA	Converted to matrix.	Issue 249
Design verification plan should only include verifying design documents and overall system design, not code-related.	Team 1	Rephrased verification method	Issue 135
Make NFR-LF2 test more specific by mentioning what devices will used to test device compatibility	Team 1	Specified specific devices and dimensions that would be used to test.	Issue 136
FR-ST1 corresponds to 4 different FRS, should split this test in to two, more specific, tests.	Team 1	Added FR-ST1.1 to make the two tests more specific and granular	Issue 137
Specified output for FR-ST1 is not really an output, but rather a process that is supposed to happen.	Team 1	Updated output to be more clear	Issue 138
All of the tests for functional requirements are manual.	Team 1	No changes made. Refer to issue comments for justification.	Issue 139
No test for ensuring scenario where incorrect credentials are provided.	Team 1	No changes made. Refer to issue comments for justification.	Issue 141

Table 7: Feedback and Changes Made for VnV Plan Documentation

Received Feedback	Source	Summary of Change	Issue Link
Expand user pool for usability testing: 2 users is a relatively small user group	Team 1	No changes made. Refer to issue comments for justification.	Issue 235
Clarify test result: Should modify the test plan to match the new requirement and mark the new test as pass/fail instead of neutral.	Team 1	No changes made. Refer to issue comments for justification.	Issue 236
Web browser tests: For NFR-OE1, mention which web browsers the system was tested on for clarity. Suggest adding a test for Opera as well.	Team 1	Clarified which browsers system was tested on for NFR-OE1	Issue 237
Make list of tasks for users to complete to be more concrete.	Team 1	Updated to include this information.	Issue 238
Explicitly state the input period of inactivity and the expected period inactivity to cause the user to be logged out.	Team 1	Updated to include this information.	Issue 239
Include number of sample uploads that were completed to get the average upload time	Team 1	Updated to include this information.	Issue 240

Table 8: Feedback and Changes Made for VnV Report Documentation

1.6 Supervisor Feedback

Table 9 summarizes the feedback received by the supervisors regarding the actual product and the changes made in response to that feedback.

Received Feedback	Source	Summary of Change
X	Bassel Adbelkader	X
Should be able to compute efficiency factors	Dr. de Lannoy	Feature implemented.
Should be able to filter through the data based on certain criteria, as just selecting data to plot by the experiment's date is not helpful.	Dr. de Lannoy	Feature implemented.
Various UI changes	Dr. de Lannoy	UI changes made. Refer to Usability Testing Report for more details.

Table 9: Feedback and Changes Made for Application

2 Challenge Level and Extras

This section outlines the challenge level and extras for the project.

2.1 Challenge Level

The challenge level for this project is general.

2.2 Extras

The extras completed for this project were:

(a) A usability testing report. This provides documentation for how usability was assessed, the results of the usability testing sessions conducted, and the changes proposed and implemented in response to the feedback received.

(b) A user guide/manual. This provides documentation for users of the product on how to use the application and troubleshoot common issues.

3 Design Iteration (LO11 (PrototypeIterate))

[Explain how you arrived at your final design and implementation. How did the design evolve from the first version to the final version? —TPLT]

[Don't just say what you changed, say why you changed it. The needs of the client should be part of the explanation. For example, if you made changes in response to usability testing, explain what the testing found and what changes it led to. —TPLT]

4 Design Decisions (LO12)

[Reflect and justify your design decisions. How did limitations, assumptions, and constraints influence your decisions? Discuss each of these separately. —TPLT]

5 Economic Considerations (LO23)

[Is there a market for your product? What would be involved in marketing your product? What is your estimate of the cost to produce a version that you could sell? What would you charge for your product? How many units would you have to sell to make money? If your product isn't something that would be sold, like an open source project, how would you go about attracting users? How many potential users currently exist? —TPLT]

6 Reflection on Project Management (LO24)

[This question focuses on processes and tools used for project management. —TPLT]

6.1 How Does Your Project Management Compare to Your Development Plan

[Did you follow your Development plan, with respect to the team meeting plan, team communication plan, team member roles and workflow plan. Did you use the technology you planned on using? —TPLT]

6.2 What Went Well?

[What went well for your project management in terms of processes and technology? —TPLT]

6.3 What Went Wrong?

[What went wrong in terms of processes and technology? —TPLT]

6.4 What Would you Do Differently Next Time?

[What will you do differently for your next project? —TPLT]

7 Reflection on Capstone

[This question focuses on what you learned during the course of the capstone project. —TPLT]

7.1 Which Courses Were Relevant

[Which of the courses you have taken were relevant for the capstone project? —TPLT]

7.2 Knowledge/Skills Outside of Courses

[What skills/knowledge did you need to acquire for your capstone project that was outside of the courses you took? —TPLT]