CSE 563 Project Individual Report Number 3

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1. Executive Summary

1.1 Background & Purpose

1.1.1. Objective

- Design an effort and defect tracking system that is a modified version of EffortLogger V1
    - Provide better support for enterprise-scaled agile with user-story integration
    - Ensure employee privacy and confidential information security

1.2. Customer Problem

1.2.1. Core Issue

- Existing application not suited for enterprise-scale agile projects needing cross-team collaboration and user-story integration for effort estimation
- Existing application does not ensure enough employee privacy and security

1.2.2. Stakeholders

- Software Engineers or users, Leadership team, Head of the customer firm, government regulators, developers of our firm

1.3. Envisioned System & Features

- Description: A desktop application that tracks and stores effort and defect reports of employees
- Features
    - All functionalities of EffortLogger V1
    - User story based effort and defect logging
    - Enabling employee privacy with professional role type logging (Engineer, Manager etc)
    - Provide security with authentication measures(login) and isolated personal storage
    - Report generation to help in improvement efforts

1.4. Operational Environment

- Accessibility: desktop application that can be run on an individual's device
- Support: Detailed documentation and a dedicated support team for post-deployment assistance

1.6. Risks & Challenges

- Security:
  - Protecting personal and confidential data stored
- Accuracy
  - Tool's accuracy is dependent on the accuracy of user entered data
- Performance
  - Desktop application will have to be compatible with the device used by employees

2. Customer Problem

2.1.   The Employees

The employees working in the customer firm will be the primary users of EffortLogger V2

2.1.1.   Inappropriate usage of personal performance data[1]

- They do not want personal identifiers with performance data

2.1.2.   Personal Information privacy[2]

- They want their personal information to be secure

2.2.   The Supervisors

2.2.1.   Employee Privacy Protection

- Individual effort and defect reports should not be used to single out individuals[3]
- If not enough reports to hide the identity of user, restrict access to data[4]

2.2.2.   Confidential Information Security

- They do not want hackers to expose private data and confidential information[5]
- They do not want competitors to have an unfair advantage by illegally accessing sensitive data[5]

2.2.3.   Transparency

- They want the process-flow of information to be transparent[6]
- How privacy is ensured must be explained in a way that is understood to all[6]

2.2.4.   Enterprise-Scale agile support

- They want the application to be scalable to fulfill the needs of the firm[7]
- They want EffortLogger to provide cross-team collaboration support[8]

2.3.   The Head of the firm

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[1] EffortLogger Customer Need V2-0 Document V1.1 : Employee Privacy, 1st Paragraph Line 1
[2] EffortLogger Customer Need V2-0 Document V1.1 : Employee Privacy, 2nd Paragraph Line 4
[3] EffortLogger Supervisor Input 2023-08-11 Point 1
[4] EffortLogger Supervisor Input 2023-08-11 Point 3
[5] EffortLogger Customer Need V2-0 Document V1.1 : Confidential Information Security, Line 1
[6] EffortLogger Supervisor Input 2023-08-11 Point 4
[7] EffortLogger Customer Need V2-0 Document V1.1 : Enterprise-Scale Support for Agile and Quality, 1st Paragraph Line 1
[8] EffortLogger Customer Need V2-0 Document V1.1 : Enterprise-Scale Support for Agile and Quality, 1st Paragraph Line 2

2.3.1. Make estimates that are data-driven

- In search of fixed pay contracts better estimates need to be made that are not opinion based[9]

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3. Concept of Operations

3.1.   Introduction

The new EffortLogger is an upgrade to an existing EffortLogger application that will be used to log the effort and defects of employees in a firm while ensuring privacy and providing security.

3.1.1. Project Description

- Background
  - The existing EffortLogger needs a revamp with growing business needs
  - The new EffortLogger must ensure personal and confidential information security
  - The new EffortLogger must provide better support for enterprise-scale agile projects
- Assumptions and Constraints
  - The employees are willing to submit their effort and defect reports
  - The data entered into the EffortLogger is accurate
  - The employees follow best practices to ensure protection against security threats

3.1.2. Overview of the Envisioned System

- Overview
  - The EffortLogger V2 will be a desktop application
  - It will track the effort and defect reports of employees
  - EffortLogger will be designed to protect employee privacy and secure confidential information
  - EffortLogger will be able to provide better support for enterprise-scale agile projects
- System scope
  - Let employees provide effort and defect reports
  - Protect employee privacy by removing identifiers from reports that are accessed

3.2.   Documents

3.2.1. Applicable Documents

- EffortLogger Business Opportunity Document 2023-01-07 V1.1 by Prof Lynn Robert Carter
- EffortLogger V2 Customer Need Document V1.1 by Prof Lynn Robert Carter
- EffortLogger Supervisor Input 2023-08-11
- EffortLogger User Input 2023-08-11

3.2.2. Reference Documents

- NASA - Appendix S - Concept of Operation Annotated Outline

- Derived Requirements, Grist Project Management

3.3. Description of Envisioned System

3.3.1. Needs, Goals and Objectives of Envisioned System

Needs and Goals

- The firm needs to track the effort and defect reports of its employees

- The firm needs to protect the privacy of its employees

- The firm needs the EffortLogger to provide confidential information security

- The firm needs the EffortLogger to be able to support enterprise-scale agile projects

Objectives

- Track employee effort and defect reports

- Provide employee privacy and confidential information security

- Provide better support for enterprise-scale agile projects

- Provide support for cross-functional collaboration between teams

3.3.2. Overview of System and Key Elements

- The system will be easy to use with a simple interface and proper documentation

- The user interface will be similar to the existing EffortLogger to provide familiarity to the users

- The system will be scalable to support the needs of the firm as it grows

- The system will ensure the anonymity of individuals in the reports accessed

- The system will show insights into the data collected to identify trends and patterns

3.3.3. Interfaces

- Login interface

  - The user will enter credentials to login to EffortLogger

- Effort and defect entry interface

  - The user will enter effort and defect reports

- Effort edit interface

  - User will be able to edit already entered effort details

- Report generation interface

  - Allows supervisors to view trends and graphs of effort and defect data

3.3.4. Modes of Operations

- Effort Entry Mode
- Defect Entry Mode
- Data Edit Mode
- Data Analysis Mode

3.3.5. Proposed Capabilities

- The system will be easy to use with a simple interface and proper documentation
- The system will be scalable to support the needs of the firm as it grows
- The system will ensure the anonymity of individuals in the reports accessed
- The system will show insights into the data collected to identify trends and patterns

3.4.   Operational Scenarios and Use Cases

3.4.1. Addressing security issues[10]

3.4.1.1.   Login to EffortLogger V2

- The user has to login to EffortLogger before entering effort or defect data
- The user will have a username and password to keep the data secure

3.4.2. Addressing employee privacy issues[11]

3.4.2.1.   Log the professional role levels instead of personal identifiers

- The data logged with EffortLogger will have a support for professional roles like engineer, senior engineer, manager etc
- The personal information will remain protected in this case

3.4.3. Enterprise-Scale Support for Agile[12]

3.4.3.1.   User story based effort logging to better facilitate estimation

- The effort logged will be tied to the user story that the user is working on
- This will help better estimation of story points for future similar projects or stories

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[10] EffortLogger Customer Need V2.0 Document V1.1 : Confidential Information Security
[11] EffortLogger Customer Need V2.0 Document V1.1 : Employee Privacy, Line 8
[12] EffortLogger Customer Need V2.0 Document V1.1 : Current Customer Need, Line 8

3.4.4.   Existing functionalities of EffortLogger [13]

3.4.4.1.   Starting effort with project and user story selected

- Once logged into the system, the user will be able to start tracking their effort
- The user has to enter details like project name, software development lifecycle step and user-story name
- Once the clock is started by user, EffortLogger keeps track of start time and project details
- Log entry is not created at time of clock start

3.4.4.2.   Stopping effort logging for a particular user-story

- After the user stops or pauses working on the user story, the clock can be stopped
- Once the user stops the clock current effort will be logged
- A new entry with fields related to the project, user-story and effort time is created

3.4.4.3.   Creating a defect report

- While working on a user-story, if user finds a defect to be addressed it can be saved to system
- User can create a new defect with the associated project

3.4.4.4.   Editing or deleting effort data

- In case user forgets to start logging data or entered details incorrectly, changes can be made
- In case user forgets to stop clock and start clock again after finishing a task, the whole time can be split into two efforts

3.4.4.5.   Editing or deleting defect data

- In case a defect has been incorrectly created it can be modified
- In case a defect has been fixed it can also be deleted or set to a fixed status

3.4.4.6.   View all logs

- Users can see all their effort and defect logs created along with project and user-story details

3.5.   Risk and Potential Issues

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[13] EffortLogger Customer Need V2.0 Document V1.1 : Prior Need from 2005

3.5.1. EffortLogger collects a lot of employee and company data that needs to be secured

3.5.2. The accuracy of EffortLogger depends on the accuracy of the data entered by users

3.5.3. There needs to be sufficient planning to use EffortLogger data as historical data to ease the planning poker process

3.5.4. The users must be encouraged to use the new EffortLogger else we will get inaccurate results

3.5.5. EffortLogger V2 will not currently have data from previous EffortLogger and this might affect estimation processes until we get a good sample set

3.5.6. The EffortLogger is a software application which may have technical issues and might not work on incompatible systems

Appendix B : Glossary of Terms

- EffortLogger: The app used to track effort and defect reports of employees
- Planning poker: A technique used to estimate effort required for a task
- Secure: Protect from unauthorized access
- Scalable: Able to accommodate more users
- Nominal Conditions: Conditions under which a system is designed to operate

4. Received Requirements

4.1.   Employee Privacy

4.1.1.   The effort and defect reports accessed by teams should be anonymized

- Employees do not want their personal performance data to be inappropriately used[14]

- They want their personal information to be secure[14]

- All effort and defect reports should not have any personal identifiable information when being accessed by any team[15]

- If there are not enough reports to ensure anonymity of the individual, access should be restricted to that data[16]

4.2.   Confidential Information Security

4.2.1.   The firm wants to ensure security from data breaches

- The firm does not want hackers to expose private data and confidential information[17]

- They do not want their competitors to to have an unfair advantage by illegally accessing sensitive data[17]

4.3.   Enterprise-Scale Support for Agile and Quality

4.3.1.   Scalable to support growth of the firm and agile principles[18]

- EffortLogger should provide cross-team collaboration support

4.3.2.   EffortLogger to store effort data based on user stories to help planning poker tool[19]

- If known criteria about the user story is mentioned, planning poker tool must be able to narrow down a few stories similar to the current story

- EffortLogger V2 should store data in such a way that this narrowing down process will be easy to perform

4.3.3.   Scaling up and revamping the existing application to better suit enterprise needs[20]

- Better data-driven estimates in case of fixed-fee or multi-year support contracts

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[14] EffortLogger V2.0 Customer Need Document V1.1 : Employee Privacy
[15] EffortLogger V2.0 Supervisor Input 2023-08-11 : Point 1
[16] EffortLogger V2.0 Supervisor Input 2023-08-11 : Point 3
[17] EffortLogger V2.0 Customer Need Document V1.1 : Confidential Information Security
[18] EffortLogger V2.0 Customer Need Document V1.1 : Enterprise-Scale Support for Agile and Quality
[19] EffortLogger V2.0 User Input 2023-08-11
[20] EffortLogger V2.0 Business Opportunity Document 2023-01-07 V1.1

4.4.   Increase efficiency of teams and provide transparency

4.4.1. Improvement Efforts[21]

- Individual effort and defect reports should have identifiers so that improvement efforts can be directed at groups in need of improvement

- Best practice information can be gathered from groups exceeding expectations

4.4.2. Process flow of information must be transparent[22]
- How privacy is ensured must be specified in a way that is understandable to all

4.5.   Functionalities of EffortLogger V2

4.5.1. It should have all existing functionalities of EffortLogger V1[23]

- EffortLogger should be a modified version of EffortLogger V1

- Should be able to log effort data and defect data

- Should be able to modify effort and defect data

- User should be able to view all logged effort and defect details

- Should be able to modify or create project details

4.6.   Nature of EffortLogger V2[24]

4.6.1. Desktop Application

- An individual's effort and defect data are private information that resides only on their personal desktop device

- This historical data is to be used to help the planning poker session with better estimates

- There will be no centralized database storing information of all employees to reduce risk of security breaches

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[21] EffortLogger V2.0 Supervisor Input 2023-08-11 : Point 2
[22] EffortLogger V2.0 Supervisor Input 2023-08-11 : Point 4
[23] EffortLogger Customer Need V2.0 Document V1.1 : Prior Need from 2005
[24] Interview with Customer Representative Prof.Lynn Carter

5. Derived Requirements

5.1.   Assist in agile activities like planning poker session

Enterprise-Scale Support for Agile and Quality[25]

5.1.1.   Provide historical data for planning poker sessions

- Need user story based effort tracking to provide historical data which is absent in current EffortLogger

- Should narrow down related stories relevant to the ones discussed during planning poker sessions

- EffortLogger should store enough project or story tags so that relevant stories can be selected from historical data at the time of poker planning session

5.2.   Login activity and offline data storage

5.2.1.   Confidential Information Security[26]

- User must login to EffortLogger so that their data is secure on their devices

- Having an authentication mechanism helps prevent unauthorized data access

- Offline storage prevents data from being on the web

- Data not being stored in a centralized storage reduces major security risks

5.3.   Storing professional roles in effort logs and reports

5.3.1.   Employee Privacy[27]

- Logged data will only have professional roles like engineer, senior engineer, manager

- Removing personal identifiers helps preserve employee privacy

- Anonymizing reports will prevent individuals from being singled out

5.4.   Data reports for improvement efforts

5.4.1.   Increase efficiency of teams[28]

- EffortLogger should generate reports that identify groups that need improvement

- EffortLogger should be able to generate reports that identify best practices from groups that are exceeding expectations

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[25]Received Requirements Section 4.3
[26] Received Requirements Section 4.2
[27] Received Requirements Section 4.1
[28] Received Requirements Section 4.4

6. Risks

6.1.   Usability Risk

6.1.1.   The ease of use of EffortLogger V2 determines whether users will be comfortable using the new EffortLogger.

- If the EffortLogger V2 is very different from the existing application, users will have resistance to using the new application
- It might even result in inaccurate data because user is not familiar with the interface
- The company will come back with modifications or reject the application if users are unwilling to use the new EffortLogger

6.1.2.   Risk can be avoided by including user's opinion at every step of the application development process

- A prototype can be made with basic functionality and user recommendations
- The usability risk can be addressed with the user review comments
- The accuracy of the EffortLogger can also be tested with tehis prototype

6.2.   Security Risk

6.2.1.   One of the supporting requirements is the security of data stored by EffortLogger

- The personal and confidential information needs to be secured
- Even if another person gets their hands on the device, data should be in an encrypted format

6.2.2.   Building a prototype that uses databases and stores data with encryption will help to test this

- If data is encrypted only user with authentication can see the data

6.3.   Privacy Risk

6.3.1.   One of the other supporting requirements is the privacy of user data stored by EffortLogger

- The personal information needs to be encrypted or dropped in reports
- Even while submitting effort reports individual data should be omitted

6.3.2.   Building a prototype that encrypts or drops personal information

- Users can use the application to see if their personal data is being used anywhere

7. Conclusion

7.1.   Brief Recap

- Design an effort and defect tracking app that is a modified version of existing EffortLogger

- Ensure employee privacy and confidential information security

- Provide better support for enterprise-scaled agile

7.2.   Customer Problem
- Core Issue:
    - Existing application not suited for enterprise-scale agile projects needing cross-team collaboration
    - Existing application does not ensure enough employee privacy and security
- Stakeholders:
    - Employees:
        - Needs: Employee Privacy, Appropriate use of personal performance data
    - Supervisors:
        - Needs: Employee Privacy Protection, Confidential Information Security, Transparency, Enterprise-Scale Agile Support
    - Head of the Firm:
        - Need: Data-driven estimates for fixed pay contracts

7.3.   Solution

7.3.1. EffortLogger V2

- EffortLogger V2 will have all functionalities of EffortLogger V1

- It will ensure employee privacy and provide confidential information security

- It will have user-story based integration to assist in agile activities

- Will be a desktop application having isolated storage in user's device

- It will be able to provide historical data to use during planning poker sessions

7.4.   Risks and Challenges

7.4.1. Security

- Employees should have enough security training to follow best practices

- Data stored on the device should not be shared by users to others

7.4.2. Accuracy of the tool

- Dependent on the accuracy of data given by users

- Wrong data will end up in incorrect effort estimation

7.5.   Parking Lot

7.5.1. Employee Training

- Training users on using new EffortLogger

- Training users on the best practices to safeguard confidential data

7.5.2. Requirement Validation

- Requirements are not be agreed upon with the customer firm

- Once requirements have been agreed prototypes can be built

7.5.3. Prototype

- Prototypes will be built to mitigate risks

- Users will be involved in prototype testing to verify the functionality is correct

7.5.4. Research and future suggestions

- More research to be done on data collection and analysis with privacy, secure software development and agile project management in mind

- Moving EffortLogger from a desktop application to a browser plugin can be considered in the future