CSE 563 Project Individual Report Number 1

Sai Ganesh Nindra

1. Customer Problem

1.1. Lack of Agile-centric effort tracking

1.1.1. Ineffective effort logging for agile teams.

- To make EffortLogger a useful tool in modern day businesses it needs to cater to modern-day practices followed by businesses like the Agile methodology. As stated in 'Agile Processes and Methodologies: A Conceptual Study'[1] agile methodology follows an iterative and incremental process, where requirements can be changed with respect to the customer needs.
- Effort Logger is not ideal for a fast-paced environment that is around in the present day. EffortLogger doesn't provide any estimation tools either which are widely used in agile teams such as planning poker. Integration of estimation techniques such as planning poker would be good.
- The ideal approach to estimation techniques to include would be machine learning. Using data-based estimation over an expert based estimation method would prove to be more useful. Using metrics such as Median of Magnitude of relative error shows more accuracy in data-based estimation[2].

1.1.2. Role-Specific Features

- EffortLogger treats everyone in the same manner, as if the person in question is a developer, project manager, product owner, tester or a scrum master, effort logger doesn't provide any features for different members of a team.
- There needs to be a certain structure wherein only users with certain access can use certain features like accessing historical data, reports and dashboards

1.2. No integration with agile tools

1.2.1. Inefficient method of tracking effort and defects

- Effort and defect are currently tracked using user input, when the task is started and when it is complete. This can be inaccurate and misleading, which can give a wrong picture of how much effort has been put and what defects occurred.
- Integration with tools like IDE's, Jira and GitHub can help track efforts based on user activity, commits and if any updates have been made by the user. This eliminates guesswork keeping a data-driven approach in the future more accurate.

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[1] Sharma, Sheetal & Sarkar, Darothi & Gupta, Divya. (2012). Agile Processes and Methodologies: A Conceptual Study. International Journal on Computer Science and Engineering. 4.

[2] Fernández-Diego, Marta & Mendez, Erwin & L. Guevara, Fernando González & Abrahão, Silvia & Insfran, Emilio. (2020). An Update on Effort Estimation in Agile Software Development: A Systematic Literature Review. IEEE Access. 8. 10.1109/ACCESS.2020.3021664. DOI:10.1109/ACCESS.2020.3021664

1.2.2. No method to track current efforts for future use

- The current data which is stored may have inaccuracies and are not used to compare with historical data. Agile teams need insights into how much effort is spent on completing tasks.
- With dashboards and visualization tools, agile teams can compare historical effort data with current effort data which will help in improving estimation strategies for the future.

1.3. Privacy and Security of data

1.3.1. Security of Data

- EffortLogger was developed in the 1990's and there are multiple new standards the industry has adopted to safeguard themselves from attacks and breaches which need to be adopted by EffortLogger.
- Old software is very vulnerable to attacks which makes it susceptible to data breaches and hacks.
- The system needs to be equipped with robust security features like multi-factor authentication and data encryption[3].

1.3.2. Compliance with rules and regulations

- Rules and regulations have been ramped up since the 1990's when EffortLogger was developed and will need updates to comply with the current regulations.
- It will lack basic encryption and will be following different data policies.
- We will need to ensure that it is certified so that it is following various government regulations with respect to data privacy and security.

1.4. No integration with cloud

1.4.1. Data stored locally

- The current version of EffortLogger stores all data locally which is in turn stored on a floppy disk. This can cause loss of data and inefficiencies in usage of such data.
- There are tracking delays as well and any updates require a lot of process as accessing previously logged data becomes a time-consuming process.
- Integration with cloud opens many doors such as no inconsistency in data, convenience in updating, automatic backups which result in no loss of data and this data can be accessed from anywhere.

[3] What is Data Protection and Privacy? n.d, https://cloudian.com/guides/data-protection/data-protection-and-privacy-7-ways-to-protect-user-data/

1.4.2. Multiplatform compatibility

- EffortLogger was just an application on the computer which causes inconvenience in modern day as users are on the go always. Not everyone has access to a computer at all times.
- Making EffortLogger accessible on mobile devices as well would help users update their work from anywhere.

2. Stakeholders

2.1. Members of an Agile Team

2.1.1. Developers

- In an agile team, the developers are the fundamental unit who work and log their work to measure their effort and help them keep a track of their productivity and give them a sense of where they stand with respect to the work being done.
- Without integration of agile tools with an EffortLogger, developers face difficulty in tracking their work which leads to inefficiency and mistakes.

2.1.2. Product Owners

- The product owner is the one responsible for establishing a stakeholder standpoint with the team and focusing on the customer needs[4]. If data being logged is inaccurate it becomes a problem in looking over progress.
- If historical data isn't present, then they will have to rely completely on guesswork making it harder to make data-driven decisions to maximize productivity and efficiency.

2.2. Business Executives

2.2.1. Owner (Financial Stake)

- Stakeholders can be an investor who puts money into the product as well[5]. They expect that the tools that is being built will meet the end user needs and will be a good market fit for them to gain a financial benefit
- As the EffortLogger of the 1990s is outdated based on security features, regulatory compliances and adaptability in the current IT environment it will not help with increasing sales or profit.
- Integrating the application with cloud and having multiple features that support agile principles will increase its acceptance in the industry, lifting its sales which in turn make it profitable.

2.2.2. Executives

- Different executives of companies look after the strategies, decision making process, profitability and engineering. They expect the tool to work with the necessary features.
- The data driven solutions that the new version brings to the table help execute strategic decisions in resource optimization , maximize productivity and profitability.
- Using dashboards and the metrics provided they can form strategies to reduce delays in projects and allocate necessary budgets as well.

[4] Langholf, Valentin & Wilkens,. (2021). Agile Project Management, New Leadership Roles and Dynamic Capabilities - Insight from a Case Study Analysis. 11. 1-18. Doi: 10.25437/jcsm-vol11-17.
[5] Dragos, Paul. (2021). THE IMPACT OF STAKEHOLDERS IN AGILE SOFTWARE DEVELOPMEN. THE ANNALS OF THE UNIVERSITY OF ORADEA. ECONOMIC SCIENCES. 30. 353-362. Doi: 10.47535/1991AUOES30(2)037.

2.3. QA and DevOps Team

2.3.1. QA Team

- The QA team is responsible for ensuring the quality of the product. They ensure that the operation of the software happens seamlessly and find new ways to improve quality. In agile they ensure quality through communication, testing, refactoring and integration[6].
- Without accurate information of defect logging and effort logging the team faces problems in understanding, what requires more extensive testing and how much progress has taken place.
- Integrating the application with agile tools can help the team identify the progress as well as if there have been certain hinderances or bottlenecks in the testing and can improvise in future stages.

2.3.2. DevOps Team

- DevOps team look after the automation and integration of systems. They ensure that EffortLogger is easily deployable and works as it should on the user end.
- As there is no integration with agile tools as of now, it doesn't allow the team to efficiently manage continuous integration, continuous deployment pipelines which will affect the quality of the product at the customers' end.
- With the software being integrated with the cloud they can ensure no inaccuracies and delay in delivering their work. Using version control systems helps in maintaining a good workflow as well. They can ensure scalability as well (catering to many users)

2.4. GRC Team

2.4.1. Governance, Risk and Compliance Team[7]

- They ensure that the tool that is being built complies with all necessary rules, regulations and standards.
- The EffortLogger being outdated was never going to comply with the current policies. It would have remained in a very susceptible environment to data breaches, which don't uphold the current policies and standards.
- By updating the necessary security features of the tool, the GRC team can ensure the safety and security of the users and their data, which in turn help the tool be available to users in the modern day as they comply with government regulations and are safe to work with.

[6] Abdullahi Wakili, Almustapha & Alhassan, Lawan & Kamagata Hamisu, Abubakar. (2024). Quality Assurance Practices in Agile Methodology. Doi: 10.48550/arXiv.2411.05134.
[7] "Regulatory Compliance in Agile Projects: Challenges and Solutions", n.d, https://transformation.agiledigest.com/regulatory-compliance-in-agile/

3. Conclusion

3.1. Overview

EffortLogger is not a sufficient tool for the current environment that exists. To incorporate and facilitate agile methodologies it needs to undergo rigorous changes. Moreover, the usage of data-based estimation techniques will be well accepted and can be very useful for the future. To increase efficiency, ease of use and access, usability and for it to be scalable it needs to undergo certain changes which are listed below.

3.1.1. Getting Accustomed to Agile

- The EffortLogger tool relies too much on manual input which can be improvised by using an estimation process, more so it being a data-based estimation technique
- Using accuracy metrics like Magnitude of Relative Error, prediction level and Median MRE can help in data=based estimation as opposed to expert based which is normal practice like planning poker, Wideband Delphi.
- The regulations over which features can be accessed by whom is very important in agile. The product owner, scrum master and the development team all have different roles.

3.1.2. Integration with Agile tools

- Currently the effort and defects are logged manually which can lead to inaccurate data. Storing data in floppy disks which are redundant is of no use.
- Integration with agile tools such as Jira, GitHub and IDE's help in automating the process of tracking the work and effort put through user activity.
- Integration with cloud helps ease the process of deploying the software and managing data. Backups and security that cloud platforms provide help in smooth operations of software.

3.1.3. Data-driven approach

- With no reporting tools in the original version of EffortLogger, historical data wasn't being used to correct or estimate current effort data.
- With the help of dashboards and visualization of metrics and using historical data, agile members can have a better understanding of how a team is working and how to utilize resources in the future

3.1.4. Security and Privacy regulations

- Regulations of the 1990's and 2000's do not apply for current software and have been updated to ensure the utmost security of data and software.
- The scope of vulnerabilities has increased multi-fold and hence the tool needs to have good security features and comply with all rules, regulations and standards set by organizations and the government.

3.2. Lack of knowledge about new tool

3.2.1. Users familiarize themselves with tools

- Since the tool is new and revamped with multiple new features, the management will have to take a strategic path in training users.
- Training will be required as the entire process of using EffortLogger is being changed, prior to this, users would manually log effort and defects, now it's an automated process.

3.3. Migration

3.3.1. Transferring data

- While changing the entire blueprint of how the system works, it is necessary to ensure no data is lost as we are transferring data to the cloud.
- Data may need to be modified as well if any compatibility issues are present and if it is feasible or not.

3.4. Parking Lot

3.4.1. Sentimental Analysis on effort logs

- Using AI to ensure the well-being of the employee through effort data and sentiment data which can also help in analyzing an employee's productivity.
- In comparison with the 1990's and 2000's, an employee's physical and mental well-being has become an important aspect and can also affect productivity.

3.4.2. Multiplatform compatibility

- Not just restricting websites and mobile applications. If smart wearables help in giving notifications or alerts with respect to the logging data.

3.4.3. An alert/notification system

- Alerts given to the user as a reminder if effort is being logged constantly due to agile tools running in background to a team leader.
- Notifications given when current effort data is about to exceed estimated effort or historical data.

3.4.4. Sprint Reports

- Using AI, an automatic generation of sprint retrospective report which helps in analyzing the productivity, issues and trajectory followed by team members.