Team Sokka

Integrated Development Tools Project

Alex Udodik, Jacob Huber, Malachi Potts, Shawn Poole

Mentor: Brandon Busby

Instructor: Bolong Zeng

CptS 421 - Software Design Project I

September 10, 2020

Project Description

This project will provide software engineers with a set of tools including a Visual Studio Code extension, a notification system, and code-search. The VS Code extension runs in the background and will automatically update version control on changes made to files in any project where the extension is used. The notification system will be implemented in conjunction with the extension and visually alerts the user to any version control changes made. The code-search tool will take a query from the user about which changes they would like to view, then display the results graphically in a UI. With these tools, software engineers will be able to increase their productivity in their VS Code projects. Each tool will be supported by a telemetry API which gathers data about the performance, usage, and health of the software. An example of how the suite of tools will work together is shown in Figure 1 (See Appendix A).

Features

Functionality

- **Visual Studio version-control extension:** An extension that can be installed in Visual Studio Code that will communicate with git to update version control whenever files are created/modified/deleted. The extension has the ability to send notifications and send health and usage data to a server.
- **Notification system:** Whenever the Visual Studio version-control extension is notified of an event that pertains to a pull request in the git repository, a notification in the form of an email is sent out to all relevant parties and users of that repository.
- **Code-search tool:** A simple user-interface based tool that takes input in the form of a query from the user. Some examples of input queries are “Who are all the users who changed this particular file?”, “What was the modification to the file in between two dates?”, and “Which user deleted a particular file”. The user-interface will be updated with the request results and can be scrolled through.
- **Telemetry API:** Gathers data about the performance, usage, and health of the software. This data will first be stored locally on the machine sending the telemetry, then will be sent in batches to a SQL server. A dashboard view will be implemented to easily monitor the health data.

Limitations

- Version control such as GitLab will not be recreated from the ground up, but will instead be used in conjunction with the functionality of the extension
- The extension will be tied to Visual Studio Code and will not be able to be utilized by another IDE such as Eclipse or IntelliJ

Review of Literature and Relationship to the Product

- **Competing commercial or public domain packages**
  - Git History VS Code extension
    - View and search git log along with the graph and details.
    - View a previous copy of the file.
    - View and search the history
  - GitLens VS Code extension
    - “GitLens simply helps you better understand code. Quickly glimpse into whom, why, and when a line or code block was changed. Jump back through history to gain further insights as to how and why the code evolved. Effortlessly explore the history and evolution of a codebase.”
  - Git Graph
    - Display local and remote branches
    - Perform Git actions
    - View commit details and file changes

- **Packages/products planned for use**
  - **Visual Studio Code** IDE will be a crucial tool for the project as it has Microsoft’s support and official documentation for developing the extension in Typescript. https://code.visualstudio.com/
  - **Git**’s version control and API will be used in conjunction with the extension to be able to send requests to the notification system.https://git-scm.com/
  - **SQL** server will be used for the storing and querying of the health and usage statistics of the software.
  - **C#** and **WPF forms** within Microsoft’s Visual Studio will be used for the development of the health and usage statistics dashboard and code search tool as they are supported by Microsoft’s official documentation.

Stakeholder Identifications / Considerations

One of the key stakeholders of the project is the mentor, Brandon Busby, who can be reached via email at brandon.james.busby@gmail.com. The other stakeholders are Microsoft, Git, users of Visual Studio Code, students, future developers, users of Visual Studio Code, other companies with their own IDE software, and IDTP Development Team. The impacts of the extension towards the listed stakeholders is considered to be mostly positive.

Positive Impacts

- **Users of VS code, students, and future developers** will be provided with a set of tools to help them develop and collaborate more effectively with programming projects.
- **Microsoft** will gain more users for their Visual Studio Code IDE and in turn can provide more support towards the IDE such as new functionality and features. Users of the Visual Studio Code IDE may be interested in using more of Microsoft's products and can possibly purchase a paid Microsoft product.
- **Git** will benefit from this project because it may give a user an introduction to git. Another consideration is if someone is familiar with git, they will be able to comfortably adapt with the suite of tools.
- **IDE's not owned by Microsoft** can receive a spike in popularity from the extension and could cause an effect on other companies to develop their own extension and suite of tools. This can cause other companies to "fight back" with each other to develop competitive products which is good for consumers/users.
- **IDTP Development Team** will gain practice and experience to design and develop a suite of tools.

Negative Impacts

- **IDE's not owned by Microsoft:** The extension will be tied with Microsoft's Visual Studio Code and will not be compatible with other IDE's. This can limit one's workflow if they prefer another IDE over another and that IDE could be used less.

Stakeholder	**Description**	**Weight**	**Net Utility**
IDTP Development Team (Team Sokka)	Team developing development tools. Assuming the project successfully develops useful tools.	1	5
Brandon Busby (Team Mentor)	Mentor guiding development of the project.	1	3
Microsoft	Owns IDE plugin and tools are developed around, may increase product usage.	2	1
Non-Microsoft IDE's	Owns IDEs plugin is not compatible with, increasing competition and possibly reducing usage.	2	0
Developers	Possible consumers of the results of the project.	3	1
General Public	The general population.	5	0

Table 1: Breakdown of Stakeholders in a table. 1*5 + 1*3 + 2*1 + 2*0 + 3*1 + 5*0 = 13

Appendix A: A Breakdown Structure

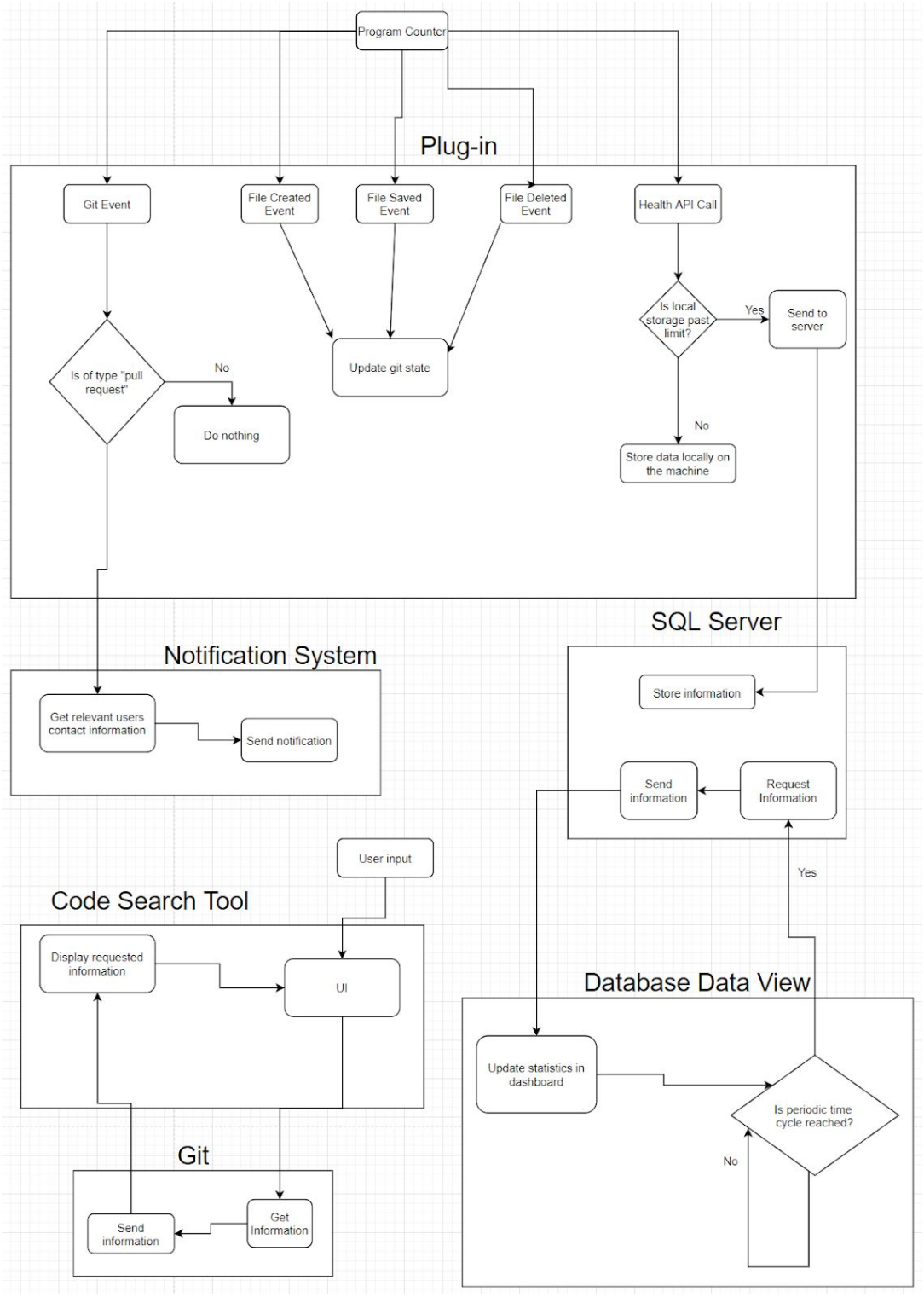

Figure 1: A breakdown structure and flow of how the Visual Studio Code extension will work with the suite of tools.

Appendix B: A Commercial Product

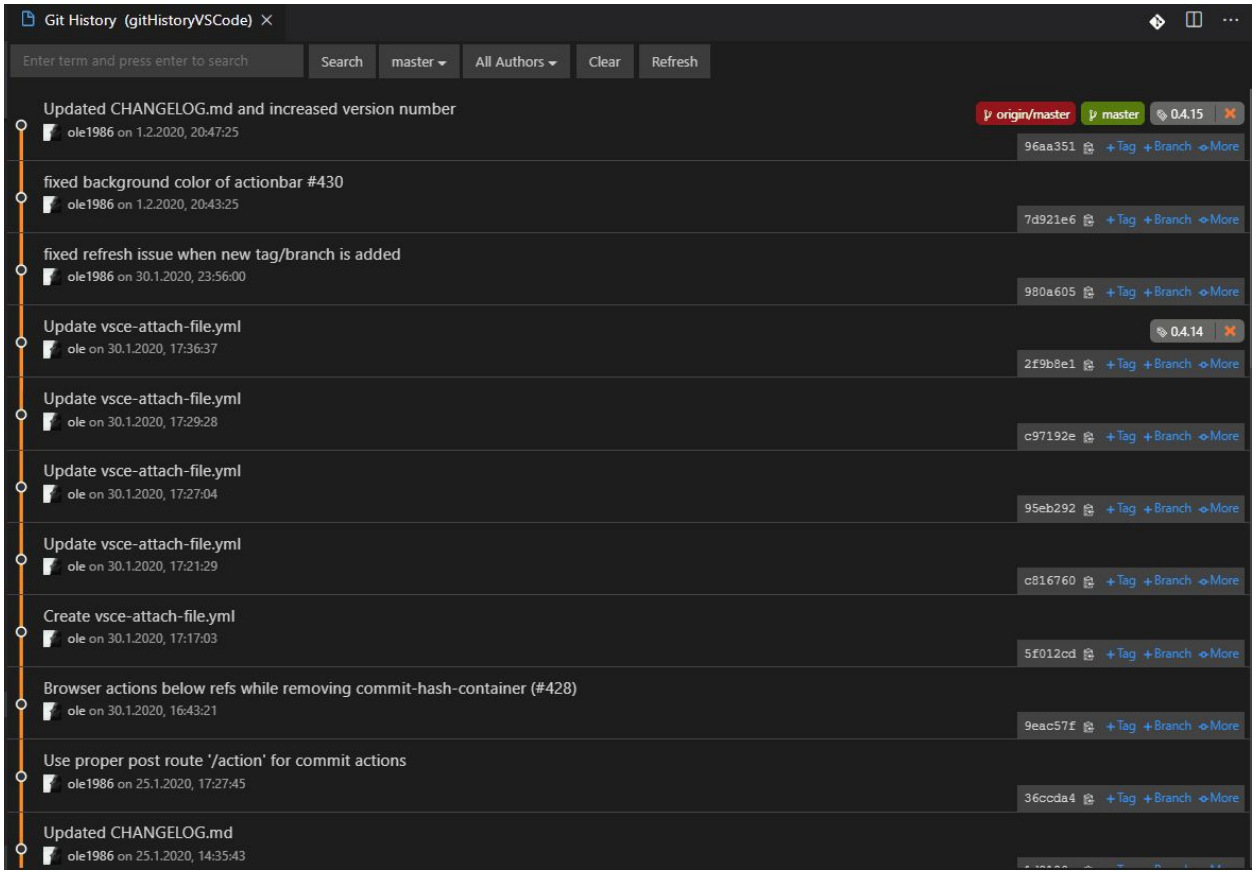

Figure 2: Git History VSCode extension with an example of how a “code-search” tool will appear.
https://github.com/DonJayamanne/gitHistoryVSCode