# Project Proposal: DevOps for GitHub

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**Project description and motivation**

We plan to work on a Google Chrome extension that can enhance the experience of GitHub, with a focus on DevOps evaluation metrics. The extension would allow users to view DevOps-related metrics on the repository page, possibly presented via visual charts. DevOps evaluation is a relatively new field, with no standard established at the time of writing. However, it is crucial for teams that want to improve DevOps further. The vanilla GitHub does not have many metrics that focus on the evaluation of DevOps, and we want to change that. Software engineering includes more than technical details but also many methodologies and standards. In this project, we want to build some helpful metrics which allow developers to evaluate the workflow and improve better. We are aware of some existing tools that might provide similar functionality to our proposal, but these tools are usually enterprise solutions, which are not suitable for a non-working environment, such as class projects. With the popularity of GitHub, our focus on the platform can benefit the most users.

Currently, there are a few key metrics presented in the midterm paper “Challenges of DevOps Implementation in the Current Age” that we can start with:

**Deployment Frequency** - calculation can be either done by number of deployments / the number of releases or number of deployments / time units.

**Defect Density** - calculation can be done by: number of issues / size of software, or number of issues / number of deployments

From the above examples, we can see that there are different ways to calculate the same metric. Our goal is to provide as much raw data as possible, which the user can customize to get the metrics that fit their goal. There are other metrics that can be used for DevOps evaluation, such as the time it takes from commit to production, project risk, and productivity. The metrics mentioned above are documented by one or more research papers, and we would try to make sure that each metric is backed up with a paper.

In addition, we are currently facing a challenge: finding or building a testing tool that can adapt to multiple languages and generate a suitable bug report for our extension is hard. Without a reliable approach to run testing for committed codes, we cannot record any data we need and finish our evaluation. We will continue to search for a possible solution as we have enough time. Otherwise, we will limit our project scope to a specific language in which we can find a tool and obtain the required data.

This project is related to Tsai-Chen Hsieh’s midterm paper “Challenges of DevOps Implementation in the Current Age”, specifically the section on DevOps evaluation.

**Implementation**

We would use the development tools provided by Google Chrome to develop the extension, which we will mainly write in Javascript. The data would be provided by GitHub Rest API, where Octokit.js can be used in Javascript. There are also many Javascript libraries that we can use for visualization, such as D3.js.