Analysis and Visualization of
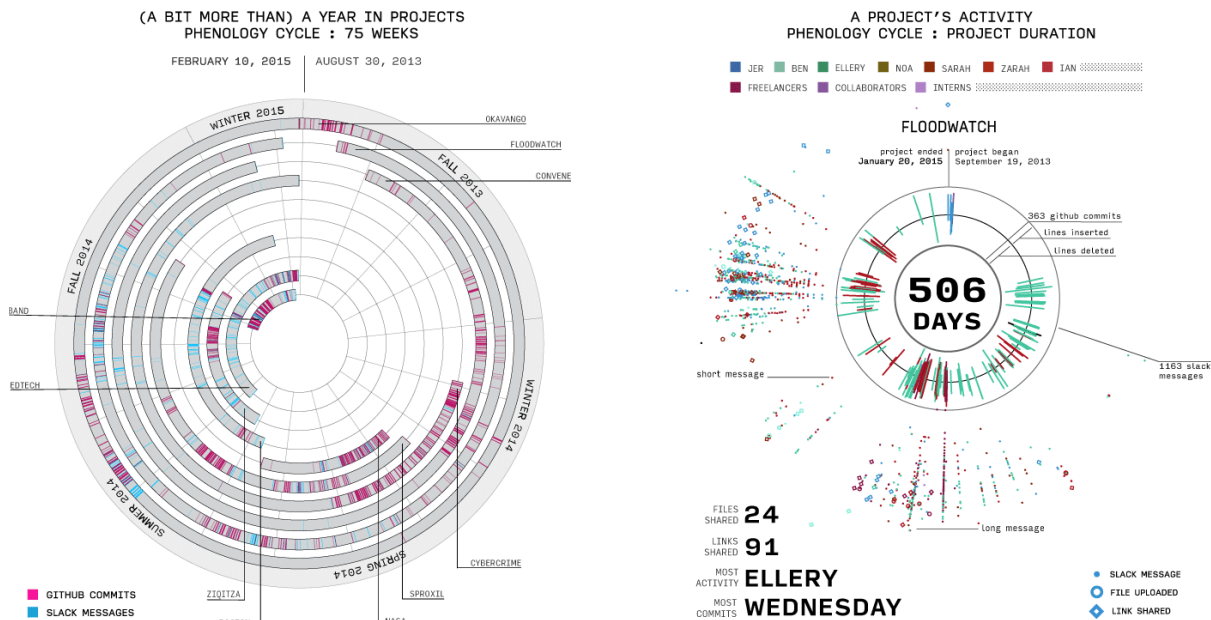# **Similarities of Software Systems**

Illustration 1: A prototypical visualization of developer activities and software metrics.

Background

Within the last decade, the process of developing software has fundamentally changed. Every aspect of the source code and developer activity is measured and assessed on a commit-by-commit basis. The measured data includes KPIs such as number of lines-of-code, test-coverage, ratio of closed and opened issues, number of commits and developers, as well as the developers' share of work among projects, and many more. In order to assess and steer your software development activities, it is important to put the data into the context of the software-specific characteristics, project-specific goals and constraints.

In this master's project we want to facilitate this process as follows: (1) we identify and rank similar software projects (peers), (2) compute a project health status (benchmark) based on metrics of peers and, if required, (3) prescribe actions that might lead to a healthier and more efficient and effective development process.

Description

Specific objectives will be discussed and detailed with the participants. We have the following tentative goals:

- Extend a prototypical service that, for a given software project, identifies and ranks similar software projects (using Natural Language Processing).
- Implement a service that benchmarks a given project against its peers and generates a project health report, including metrics, rankings, visualizations, etc.
- Use visualizations for presentation of benchmark results (embedded interactively within reports) and for internal validation of similarity measures.
- Sketch a process, that detects shortcomings based on peers and benchmarks and deduces appropriate mitigation strategies.

The master's project refers to current research and software projects of the Computer Graphics Systems group. It is especially suited for further research in the context of a master's thesis or a future doctoral thesis. Further, the master's project can lay a foundation for working as a student assistant or software developer at our research partners.

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