Presentation Abstract of Quality, Sentiment, and Pull Request Acceptance: An Early Empirical Study

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Abstract

Context: Developer Experience (DevEx) covers the experiences developers encounter in their work, including tooling, processes, and interpersonal relations. A degraded DevEx harms productivity, mental health, and the quality of the produced work. Yet the social dimension of development remains largely absent from software quality models, which rely on quantitative metrics, while DevEx is mostly assessed qualitatively through surveys. Submitting and reviewing pull requests (PRs) is one of the most frequent shared experiences in modern software development, and prior work shows that PR acceptance is dominated by social rather than technical factors. This raises a question: if the discussion surrounding a PR carries emotional signal, does that signal come from the code under review?

Objective: We study the relationship between software quality and the sentiment expressed in PR discussion threads. We ask (RQ1) whether the quality of the code in a PR can be used to infer the sentiment of its discussion, (RQ2) whether discussion sentiment relates to PR acceptance or rejection, and (RQ3) whether interpersonal relations between maintainers and contributors shape discussion sentiment.

Method: We mined 429 PRs from ten Java projects (Google, Netflix, and Spring ecosystems, plus JabRef and Mockito), drawn from the labeled PRemo dataset. For each PR, we computed size, complexity, coupling, and cohesion metrics with CK on every modified class and method, before and after the change. We classified the 3,120 discussion messages with the VADER sentiment analyzer and aggregated comment polarities per PR. We analyzed the results with Spearman rank correlations and grouped comparisons by polarity and outcome.

Results: We find no evidence that classical structural quality metrics carry any signal about discussion sentiment: all correlations are close to zero, and per-project trends do not transfer. Discussion sentiment barely informs the PR outcome, except that polarization in either direction associates with rejection: 23.8% of neutral-discussion PRs were merged, against 15.0% of positive-discussion and 7.7% of negative-discussion PRs. Within Spring Boot, the largest project of our sample, we detect no interpersonal bias: no maintainer exhibits a polarized posting pattern toward specific contributors. As a practical warning for repository-mining studies, we also observed that Spring Boot closes PRs while integrating the changes through other branches, so unmerged PRs does not reliably mean rejection.

Conclusion: These findings suggest that, in our dataset, the tone of PR discussions is shaped neither by the intrinsic properties of the code nor by the interpersonal history of the participants. They highlight the difficulty of linking the social aspects of developer experience to measurable software quality outcomes. Our future work includes stronger sentiment measurement through manual labeling or transformer-based classifiers, replication on projects without an enforced code of conduct, and, in the long term, quality models that make the social forces driving acceptance decisions first-class quality signals, e.g., by measuring community smells alongside classical metrics. We release our dataset, extraction pipeline, and analysis scripts in a replication package (Zenodo DOI 10.5281/zenodo.20430567).

Keywords

developer experience, sentiment analysis, code quality, pull request, repository mining

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