Revolution or Regression?

- A Comparatively Empirical Study of Two Integration Processes

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SAP®

MCIS

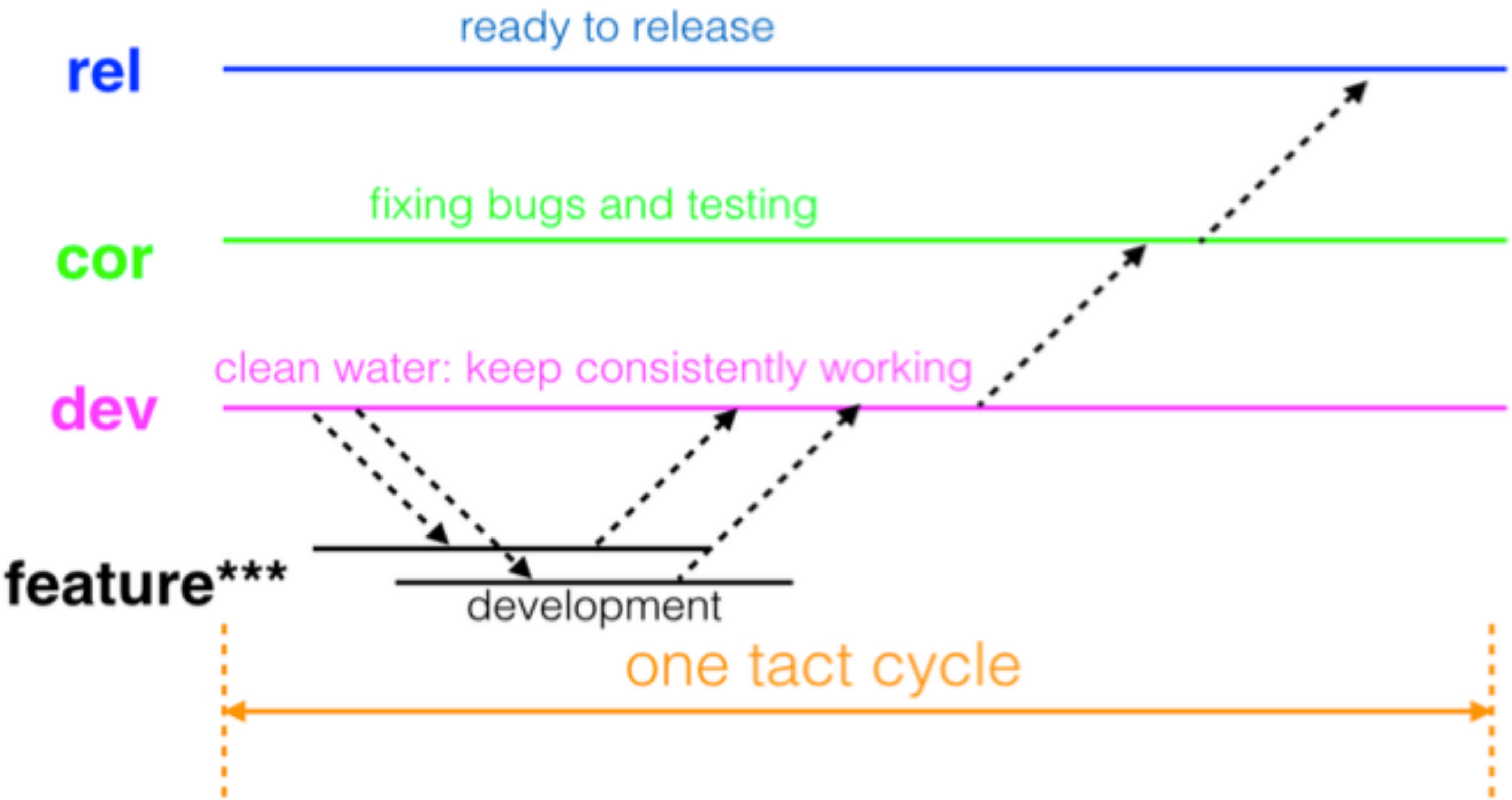
Yujuan Jiang, Josh Chiang, Roy Budhai, Bram Adams

Feature Toggle

- Check in whenever you want
- Build and test on most up-to-date trunk branch
- Won’t be executed in the product if the “toggle” is switched off

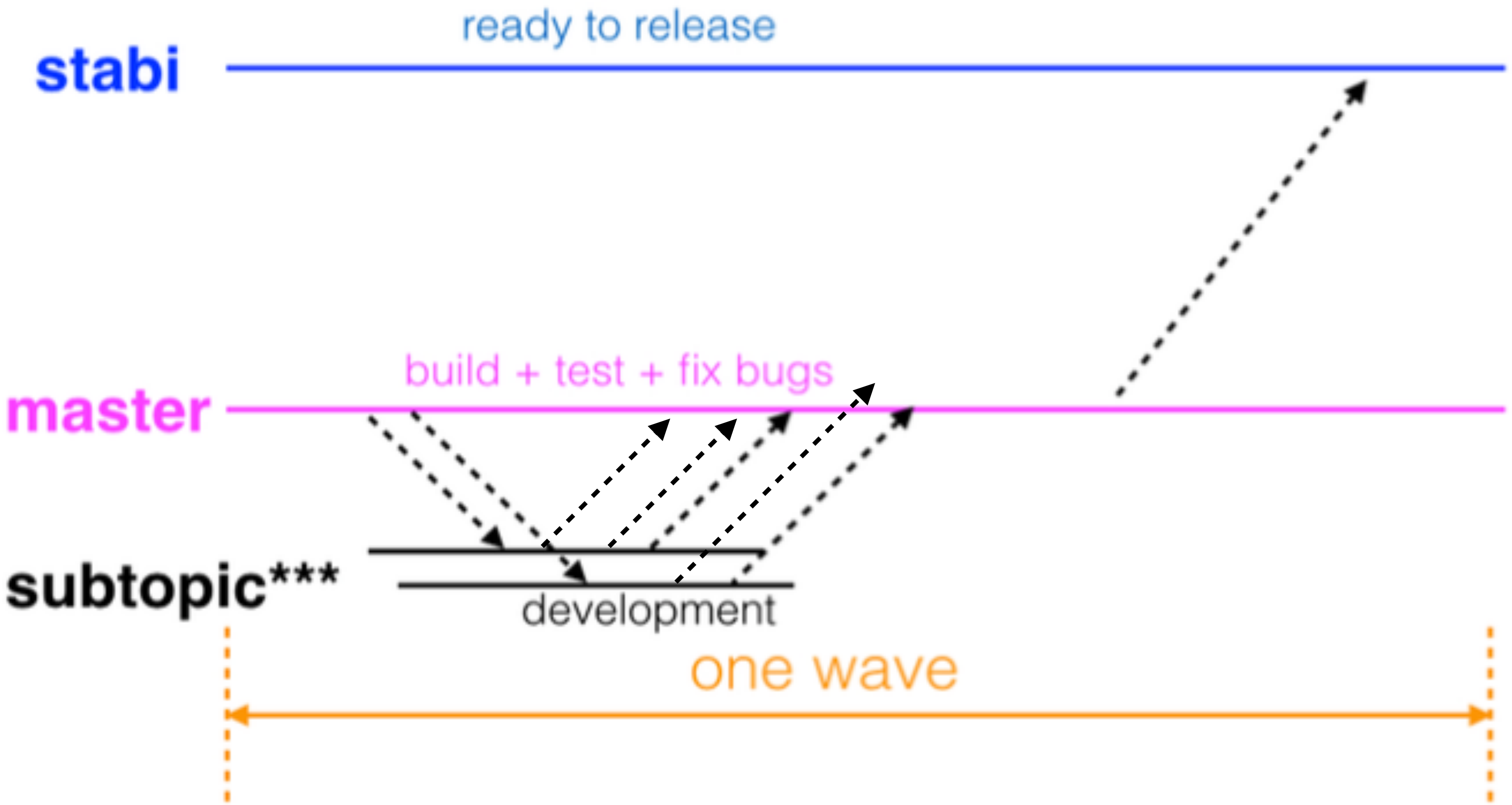
Agile vs Waterfall Integration

Project A: Branch-based (Waterfall) approach



Clean water development: each feature branch got merged back to dev branch only after the whole feature is completed. Only bug-fixes will be cherry-picked to cor/rel branch.

Project B: Toggle-based (Agile) approach

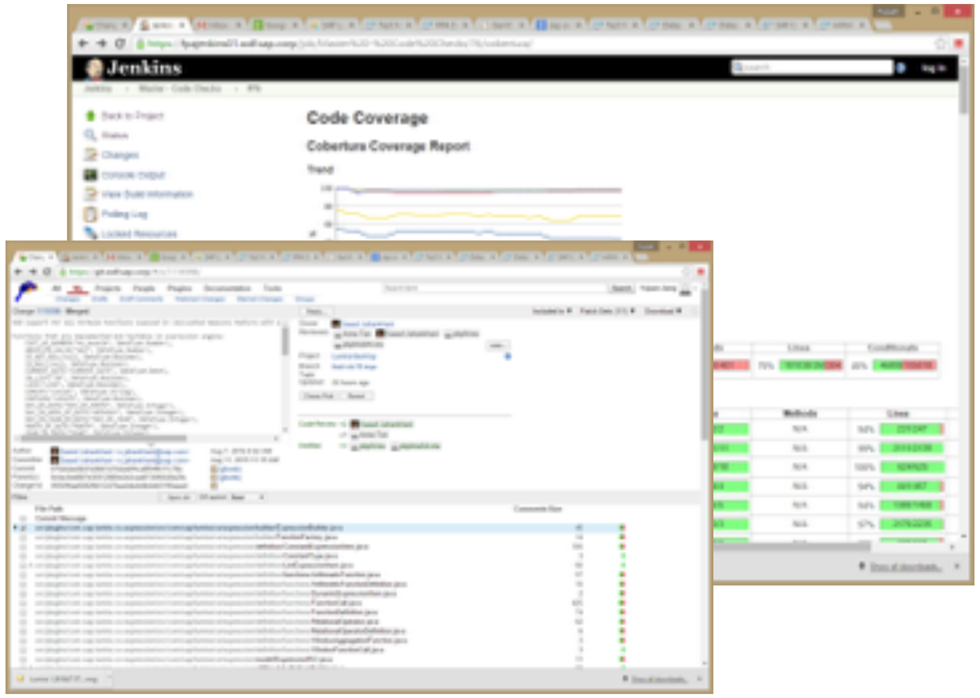


Each feature branch check in master branch whenever they want. Merge small, merge faster. Yet as long as the toggle of this feature is not turned "on", the code will not be integrated into release branch.

Key Performance Indicator (KPI)

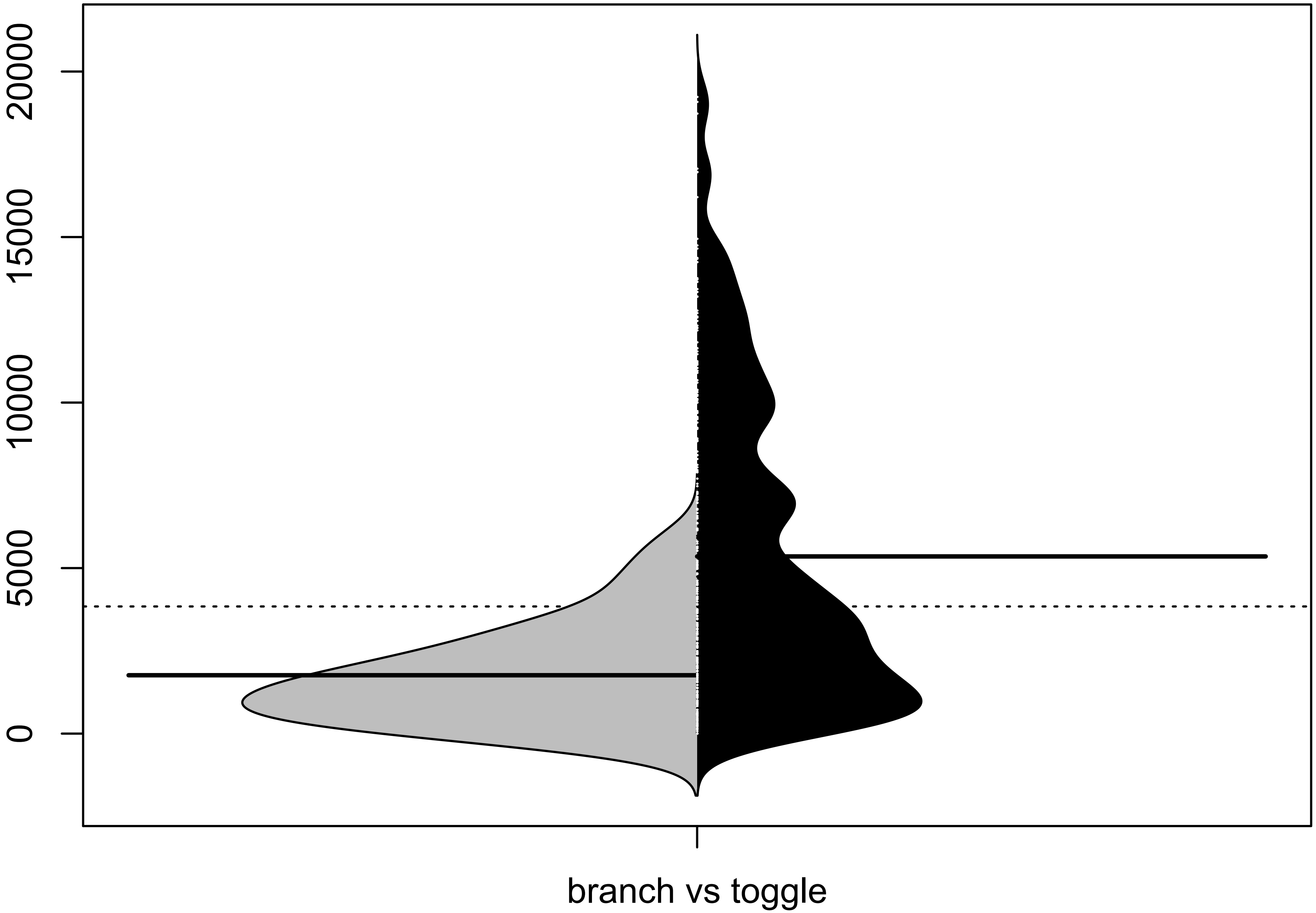
- **Integration effort**: size of merge commit
- **Productivity**: #LOC per developer, success rate
- **Quality assurance**: # of bugs

Fetching Data



- From Jenkins (build logs)
- From Gerrit (git logs)
    - ✳ JSON + Python + Perl + .javascript

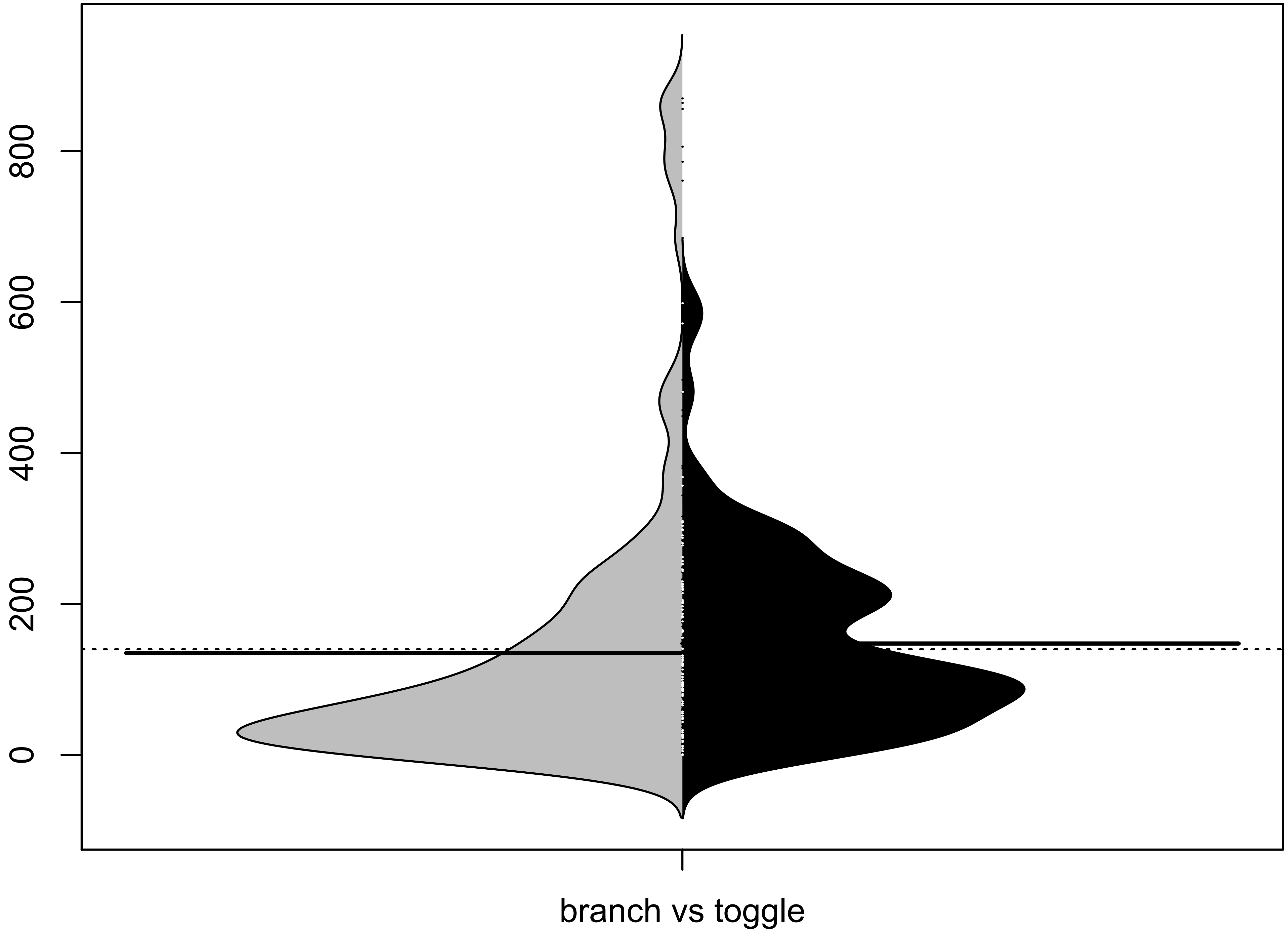
Integration Effort



Project A

Project B

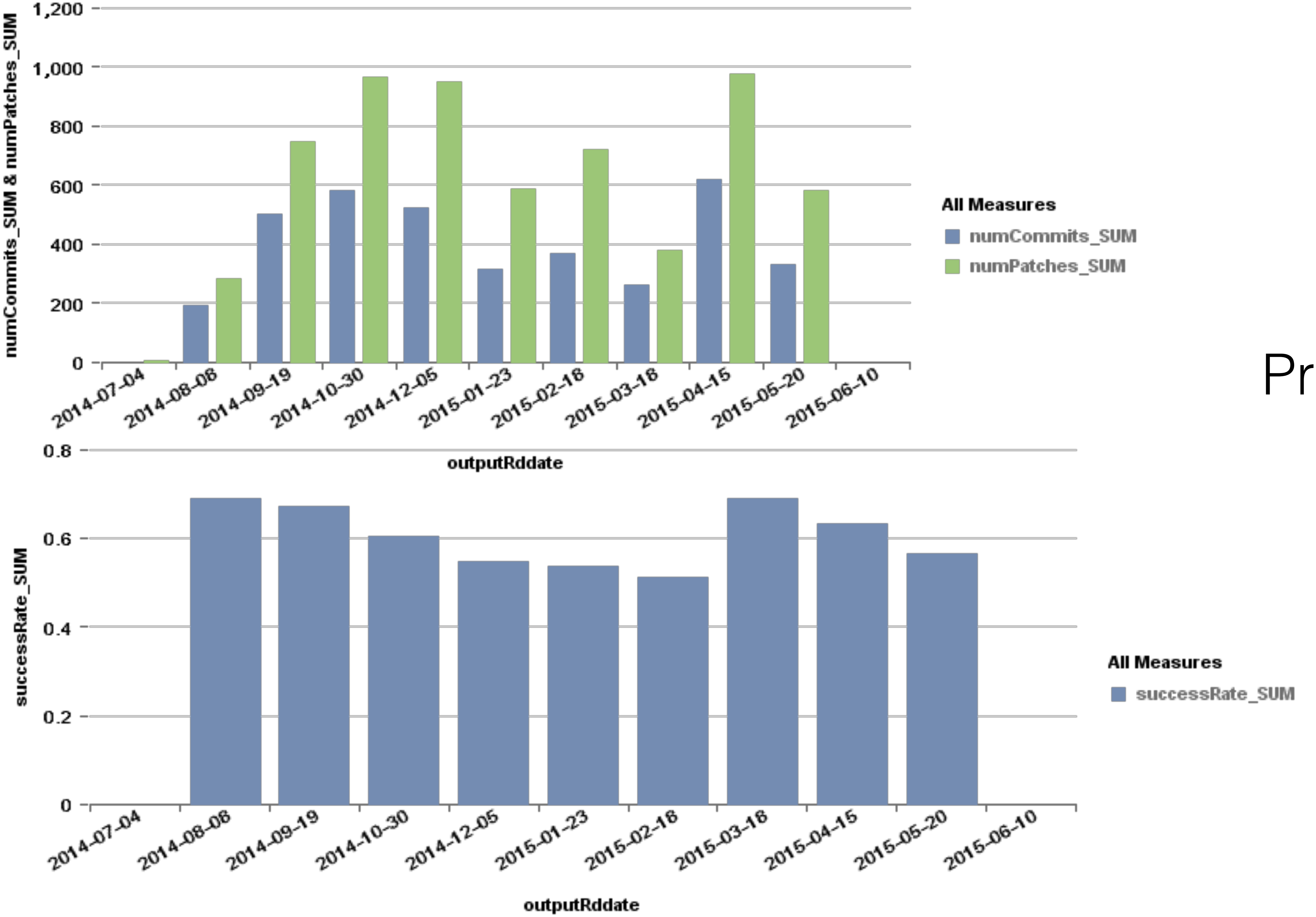
Productivity (#LOC)



Project A

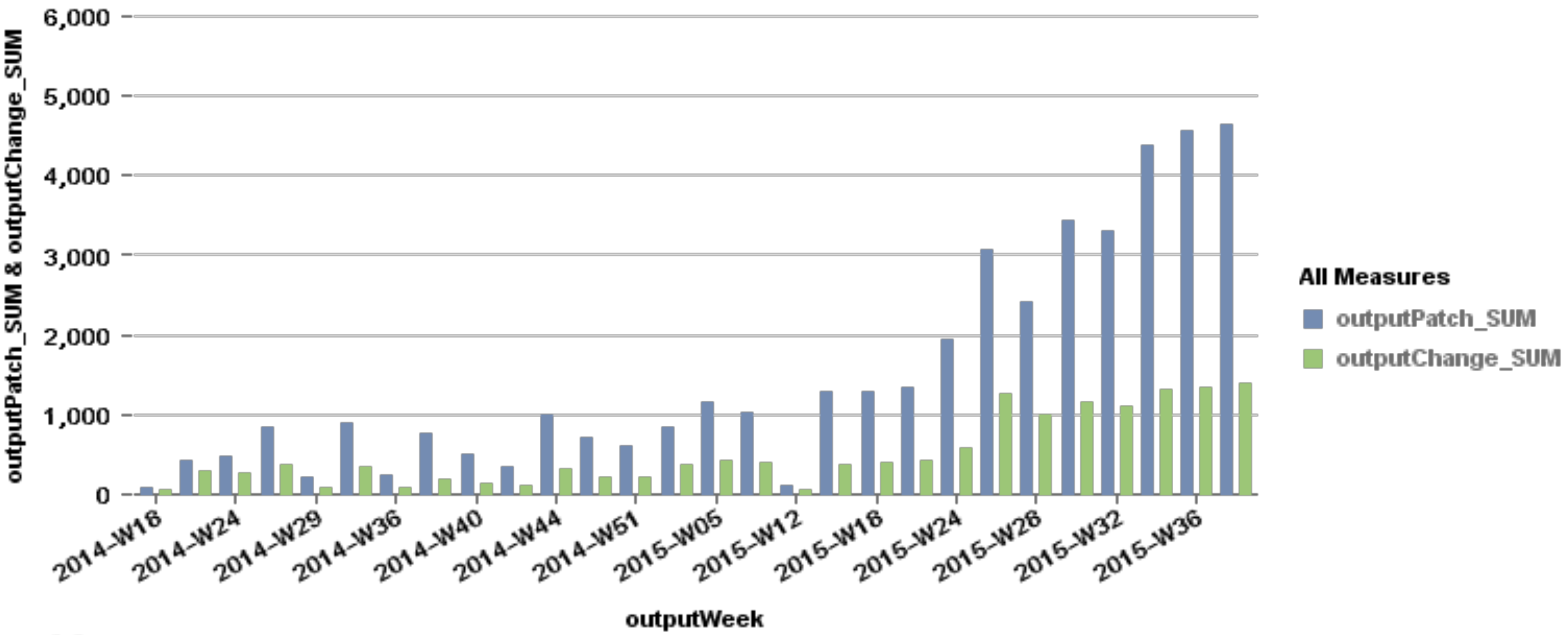
Project B

Productivity (Success rate)

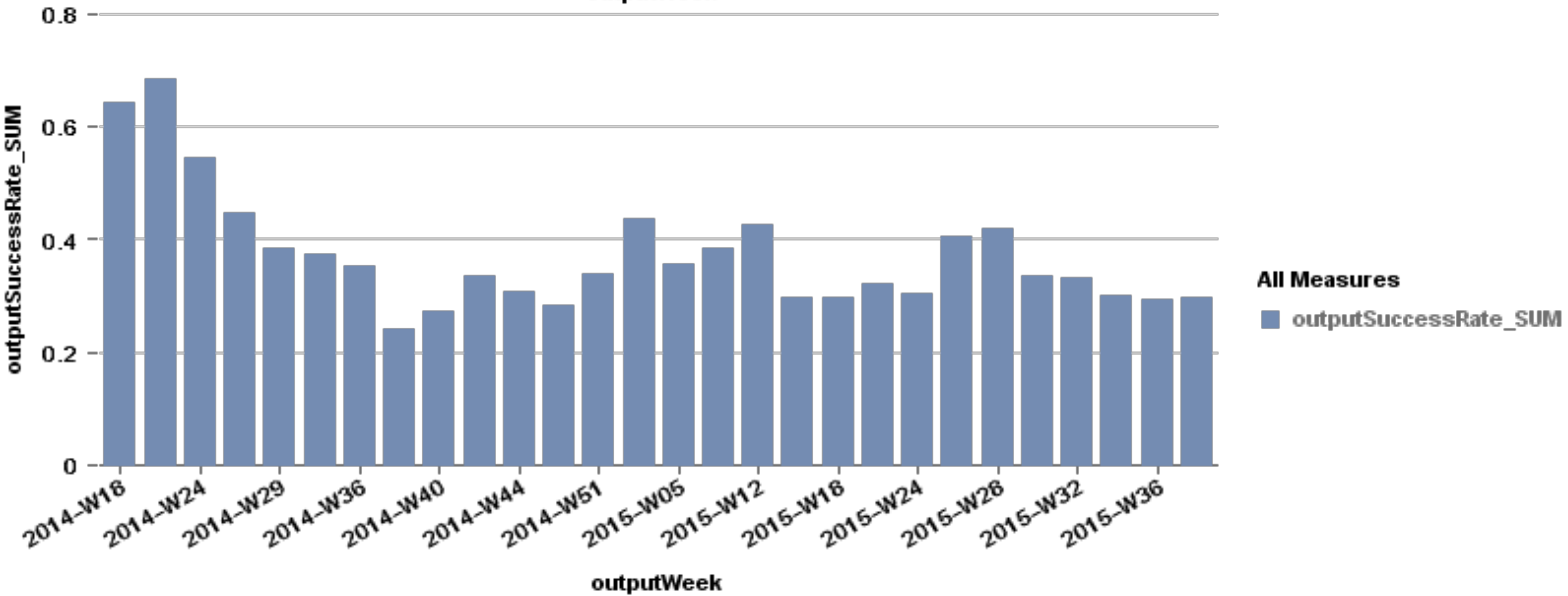


Project A

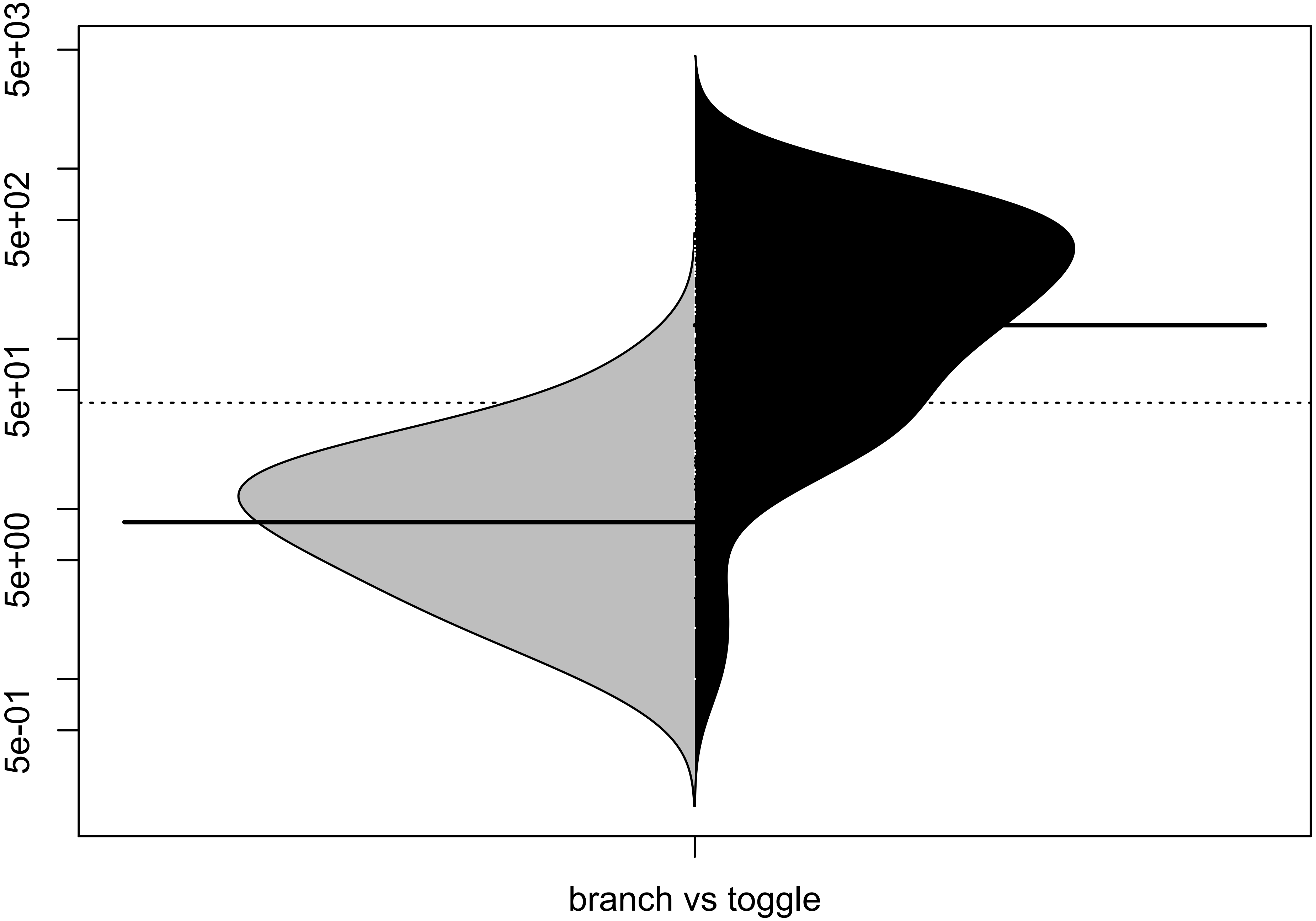
Productivity (Success rate)



Project B



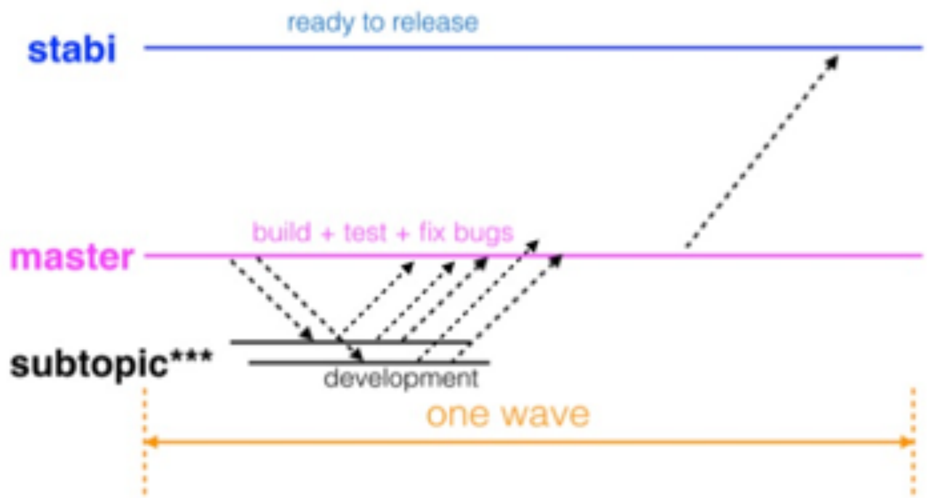
Quality Assurance



Project A

Project B

Project B: Toggle-based (Agile) approach



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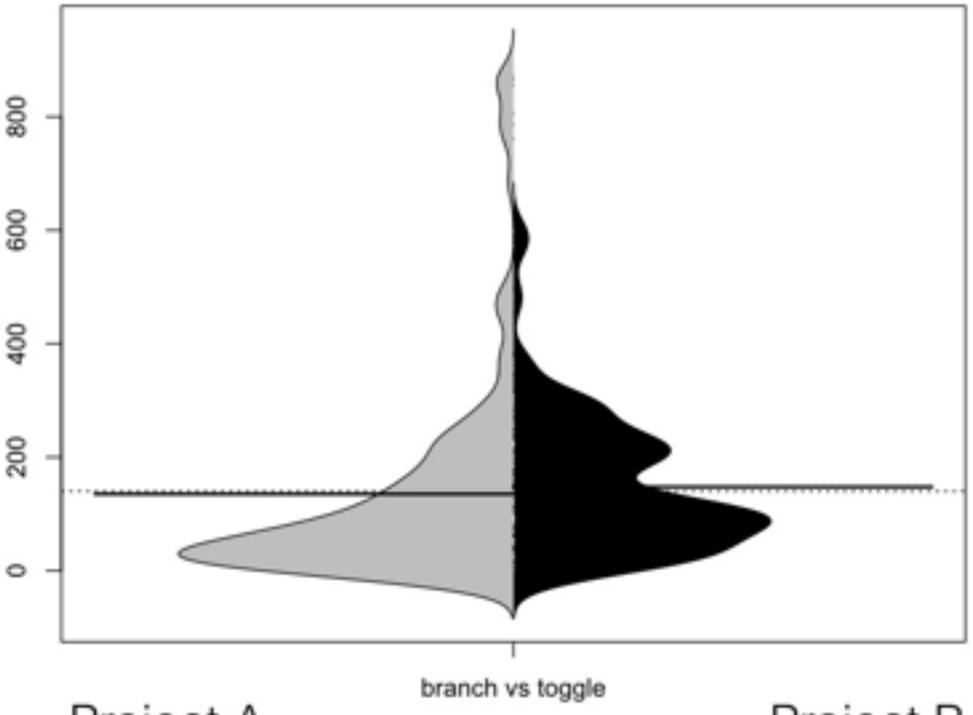
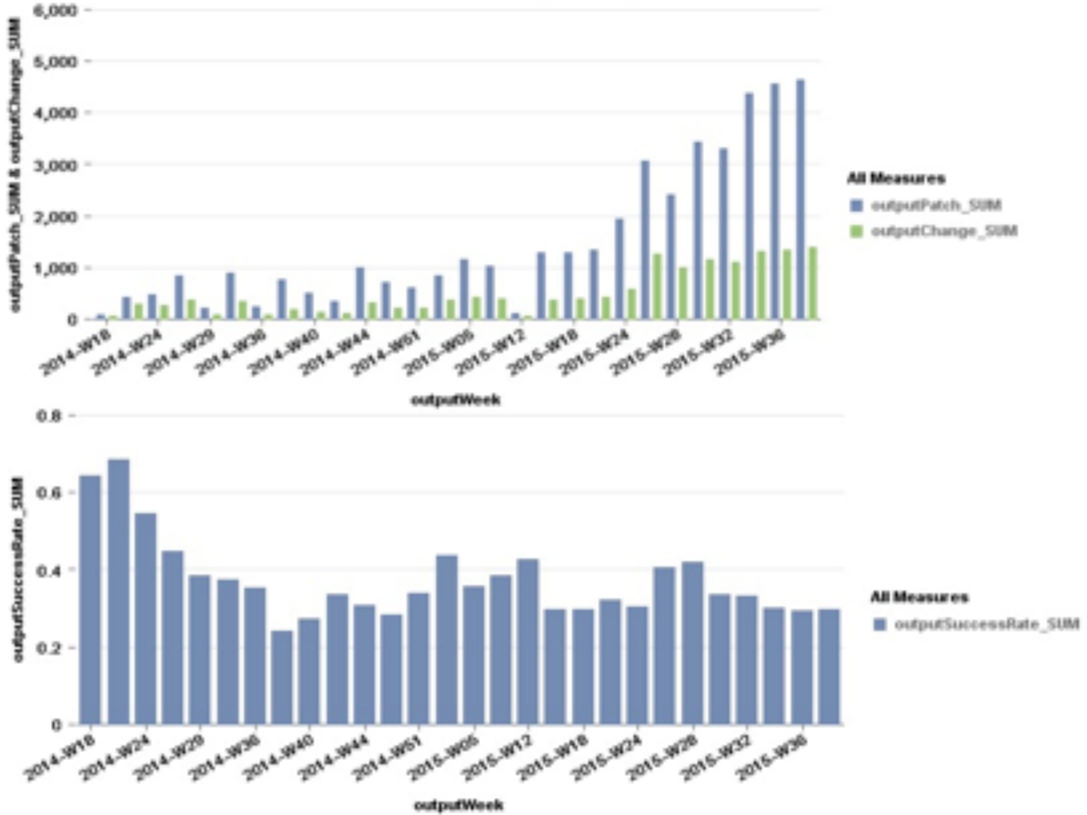


Project A

Project B

Productivity (Success rate)



Project B