

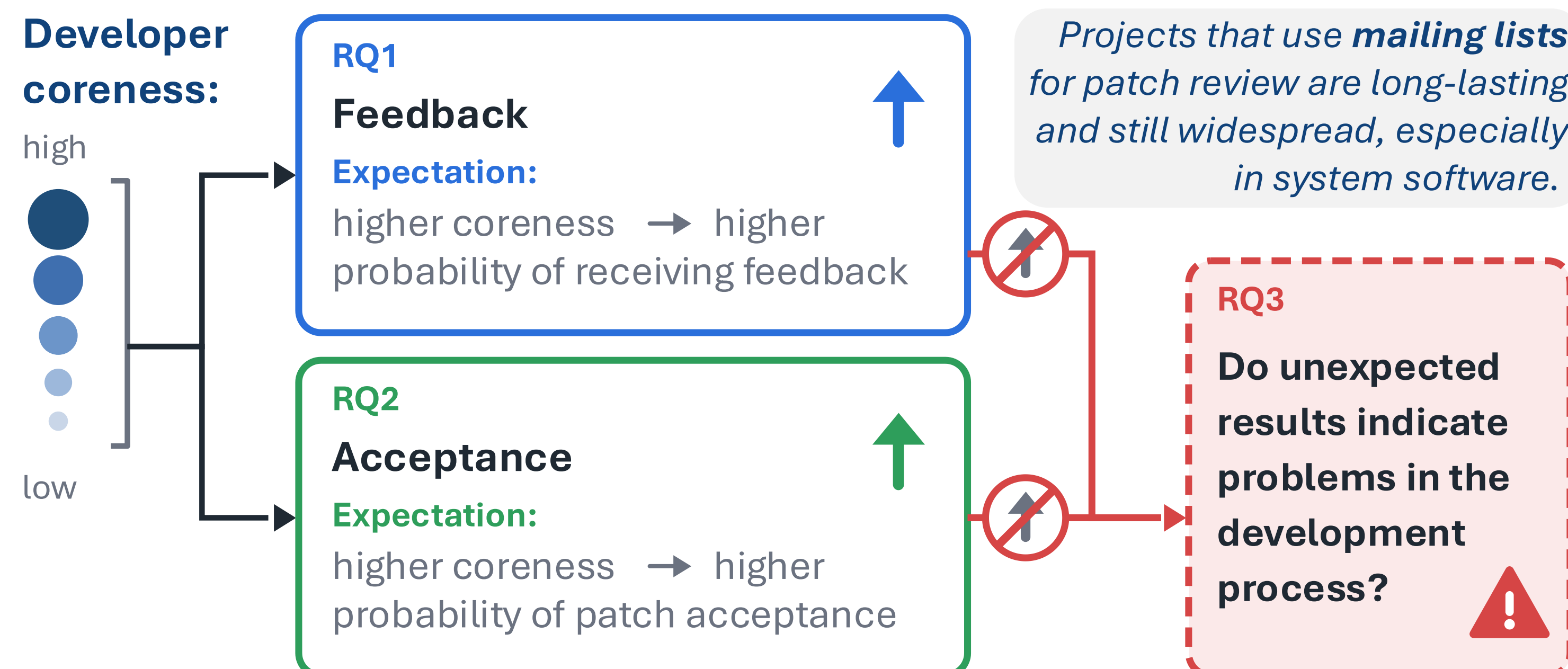


How Developer Coreness Influences the Patch-Review Process: A Mixed-Method Study

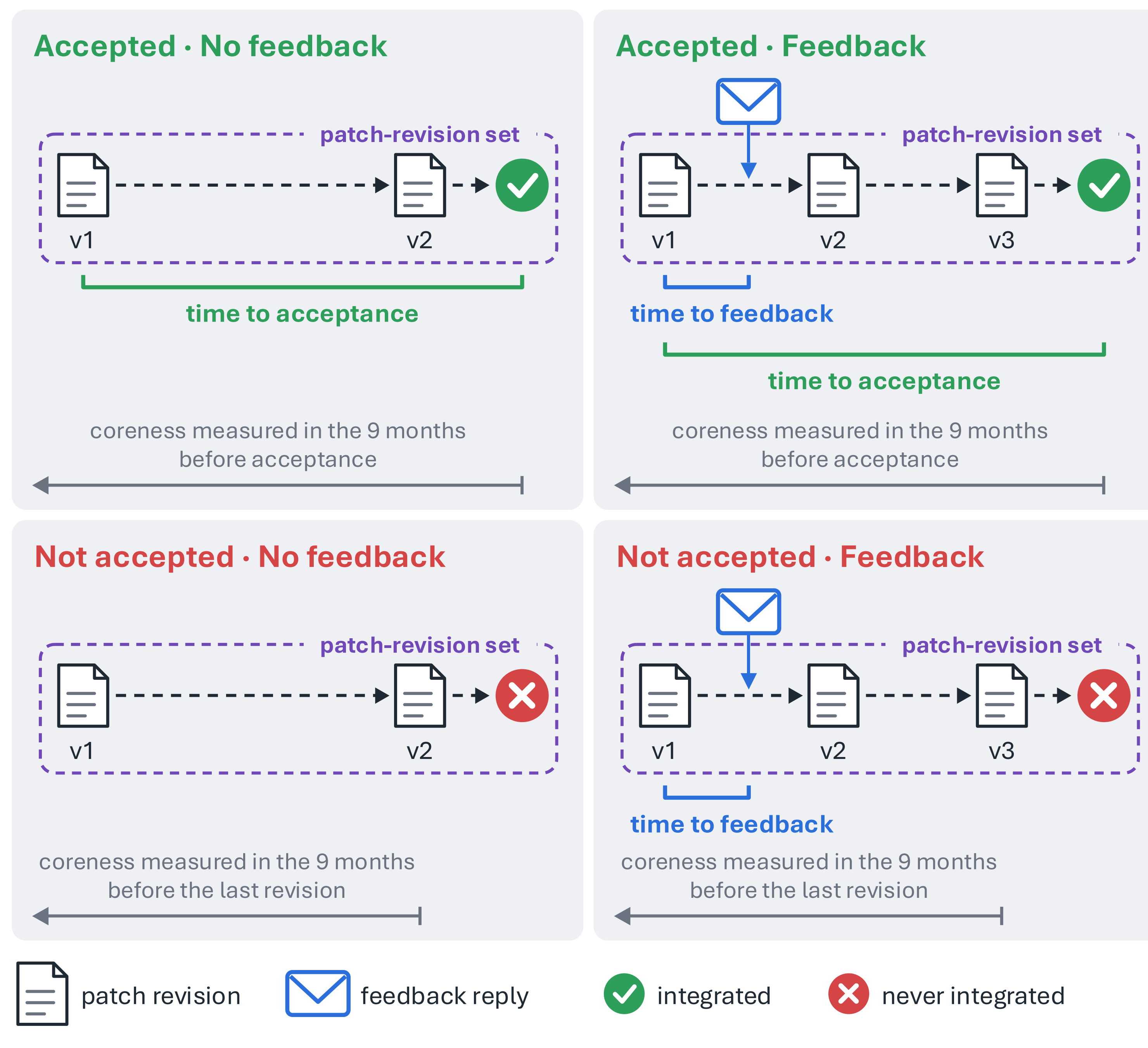
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Motivation and Research Questions

Patch review is the quality gate of open-source software (OSS) projects.

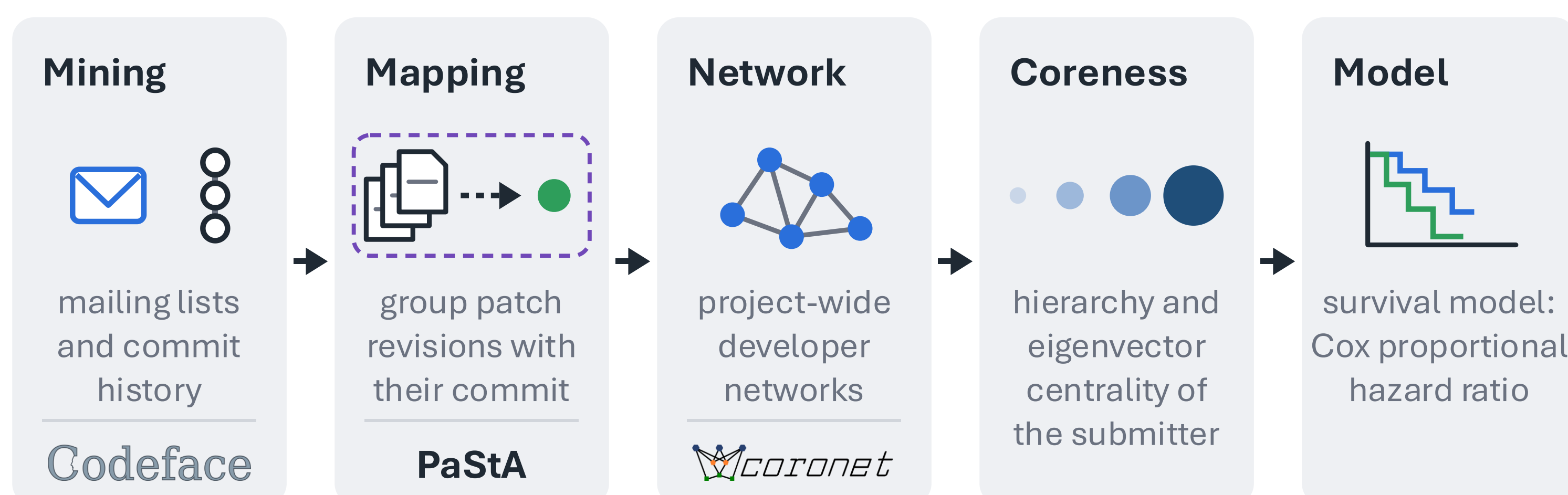


Measuring the patch-review process on the mailing list:



Approach

Quantitative analysis:



Qualitative analysis:

Identification of process-deviant projects

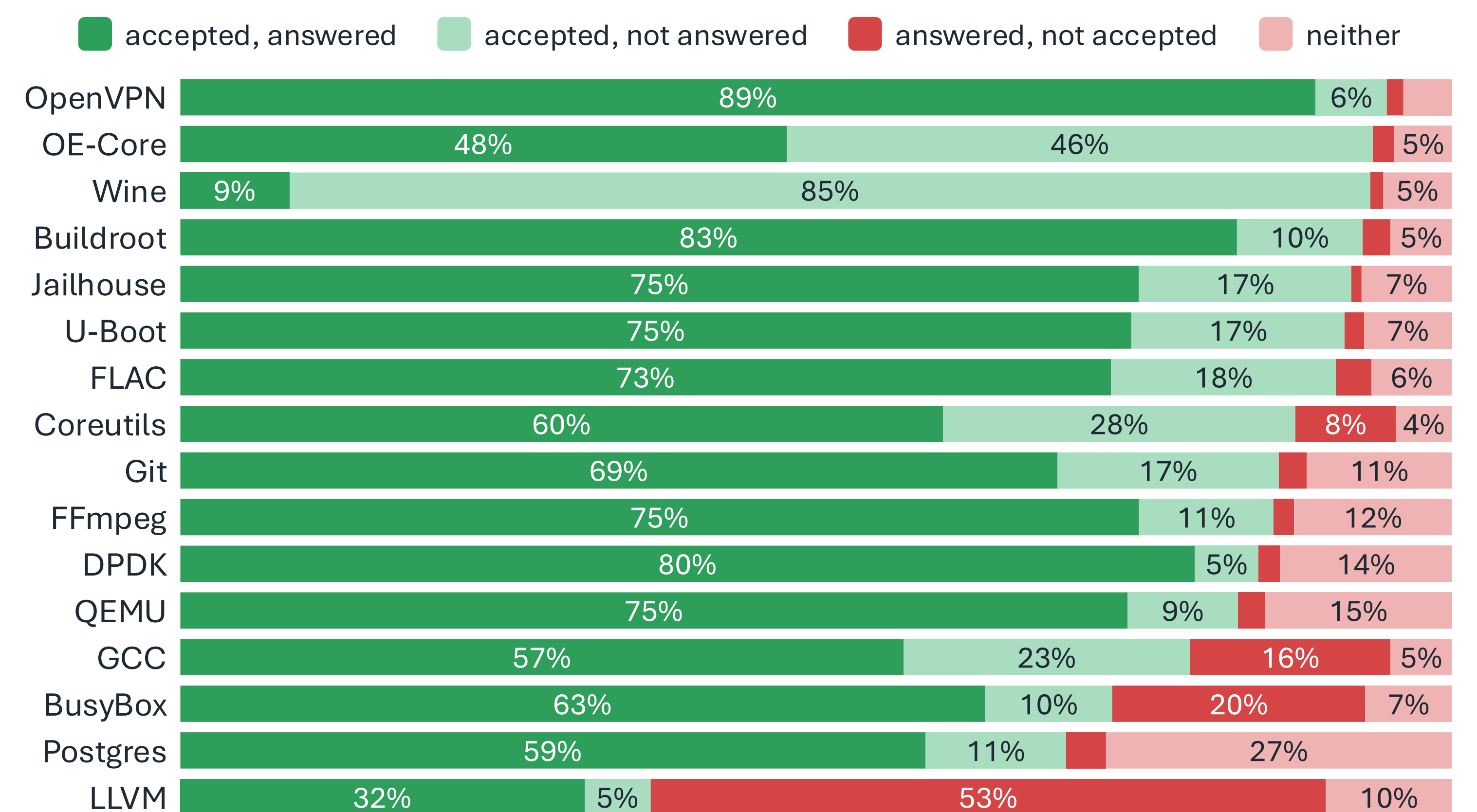
commit coverage (i.e., share of commits sent to the mailing list as patches for review) < 66.7%

or unexpected RQ2 result

Expert interviews

about the integration process
answers received from 9 of 16 projects

Results



Identification of process-deviant projects:

Project	Period	Commit coverage	RQ1	RQ2	
U-Boot	2000–2020	92.1%	✓	✓	as expected
OE-Core	2011–2020	91.9%	✓	✓	as expected
DPDK	2013–2020	90.8%	✓	✓	as expected
Jailhouse	2013–2020	89.1%	✗	✓	not as expected
QEMU	2003–2020	89.1%	✓	✓	as expected
Git	2005–2020	81.1%	✓	✓	as expected
Buildroot	2006–2020	78.9%	✗	✗	process-deviant
OpenVPN	2005–2020	69.3%	✗	✓	as expected
Wine	2001–2020	69.1%	✓	✓	as expected
Coreutils	2010–2020	68.8%	✗	✓	as expected
GCC	1996–2020	30.2%	✗	✓	as expected
FFmpeg	2003–2020	28.1%	✗	✓	as expected
Postgres	2002–2020	16.2%	✓	✓	as expected
FLAC	2000–2020	8.3%	✗	✓	as expected
LLVM	2002–2020	8.1%	✗	✗	not as expected
BusyBox	2002–2020	5.5%	✗	✓	as expected

66.7% threshold

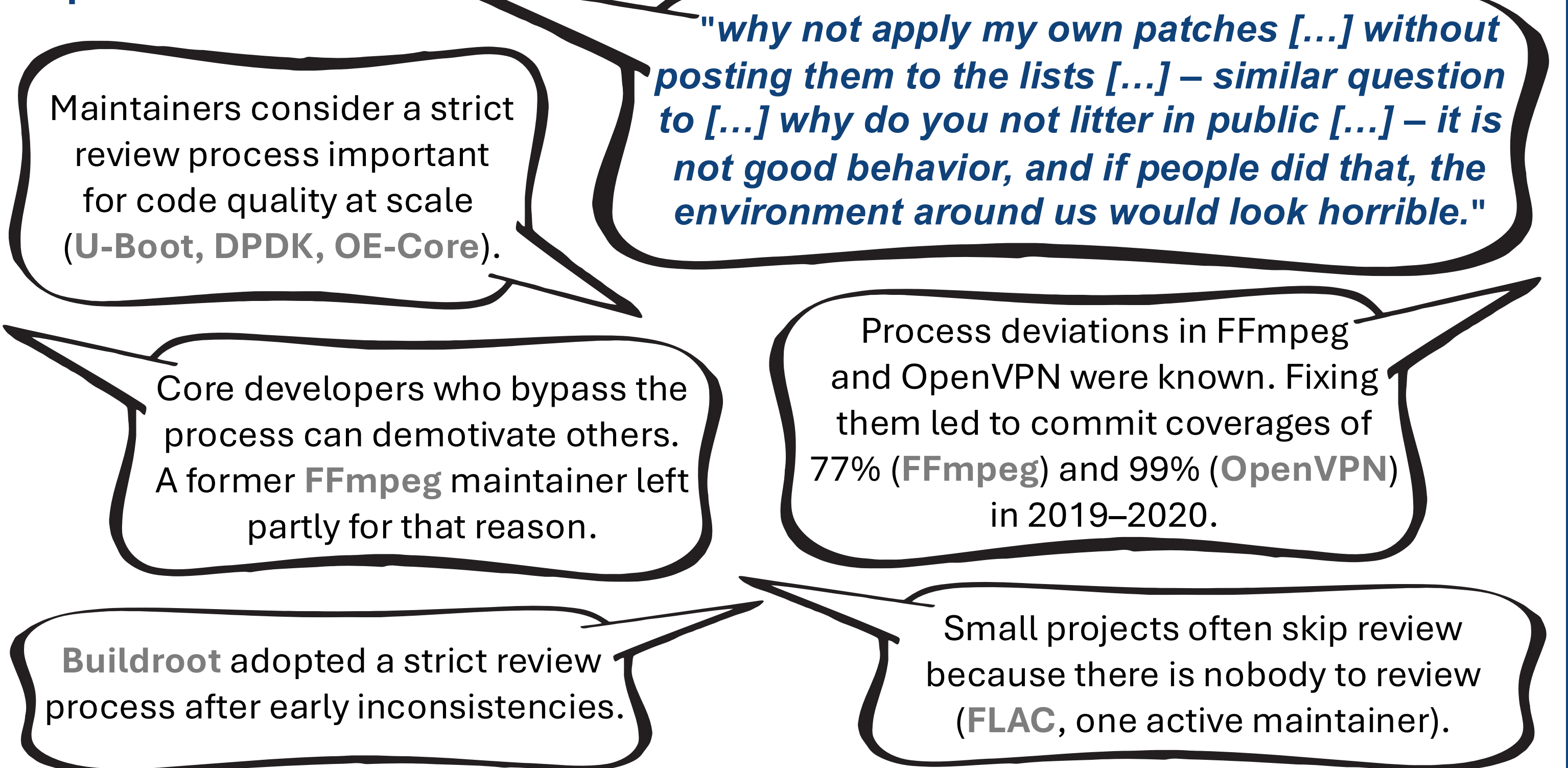
GCC: no enforced patch format → many commits can't be traced to mailing list.

Postgres: review after patch integration.

LLVM: moved from mailing lists to Phabricator → low commit coverage.

BusyBox: one maintainer rewrites patches and commits them directly.

Expert interviews:



Conclusion

Feedback (RQ1): mixed results (in some projects, higher coreness leads to a higher probability of getting feedback; in others not).

Patch Acceptance (RQ2): largely consistent (higher coreness leads to a higher probability of getting a patch accepted).

Problems in the Development Process (RQ3): deviations from expected phenomena (e.g., being less strict with the submission process) indicate procedural problems in the process.

Our method can be used to find indications of procedural problems in OSS projects.

Check out our paper:

