



Growth of Newcomer Competence: Challenges of Globalization

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History: Developer's competence

Claim the issue

Hire the best person

Cognitive science: the behavioral aspects of software engineering, in particular, individual differences : 23-28:1

- Curtis

Barriers

"Until the many sources of variation among individuals have been compared in the same set of data, it will not be possible to determine precisely ... the most important predictor of success in training programs or on the job"

- Curtis

Claim the methodology

Empirical study was initiated

"By using ...source code change history and problem reports we quantify aspects of developer participation, ..."

Census of public source code history:

Some fundamental questions can be answered only by considering the entire universe of publicly available source code and its history

Issues and opportunities coexist today

Developer competence issues become critical

1950's



1984



2000



2010

Time

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❑ Traditional organization

➤ Offshoring/outsourcing

- “All (outsourcing) teams have similar experience levels, and all have had an influx of graduates and are struggling to get them up to speed” -Outsourcing manager
- *How to speed up the project newcomers?*

➤ Massive retirement of core developers in mature legacy products

- “Original developers probably understood how features would ..., but subsequent are not necessarily aware of the whole context.” - Top developer
- *How should the newcomers learn about the product?*

❑ Open Source Software (OSS)

- The explosion of OSS development, e.g, the cooperation between PKUAS and JOnAS: Numerous issues had to be recognized and addressed, including culture, language, time-zone, and, accessibility to the knowledge about the code and the development practices.
- *How individuals and companies should learn to participate in the OSS projects?*



Understand and improve developers' project competencies

❑ Environment: Culture and Communication

- *“(In India) we expect a high level of attrition, so ownership has to be distributed among developers, which is not something we would do in the UK.” – Outsourcing manager*

❑ Master's road: The learning of experts

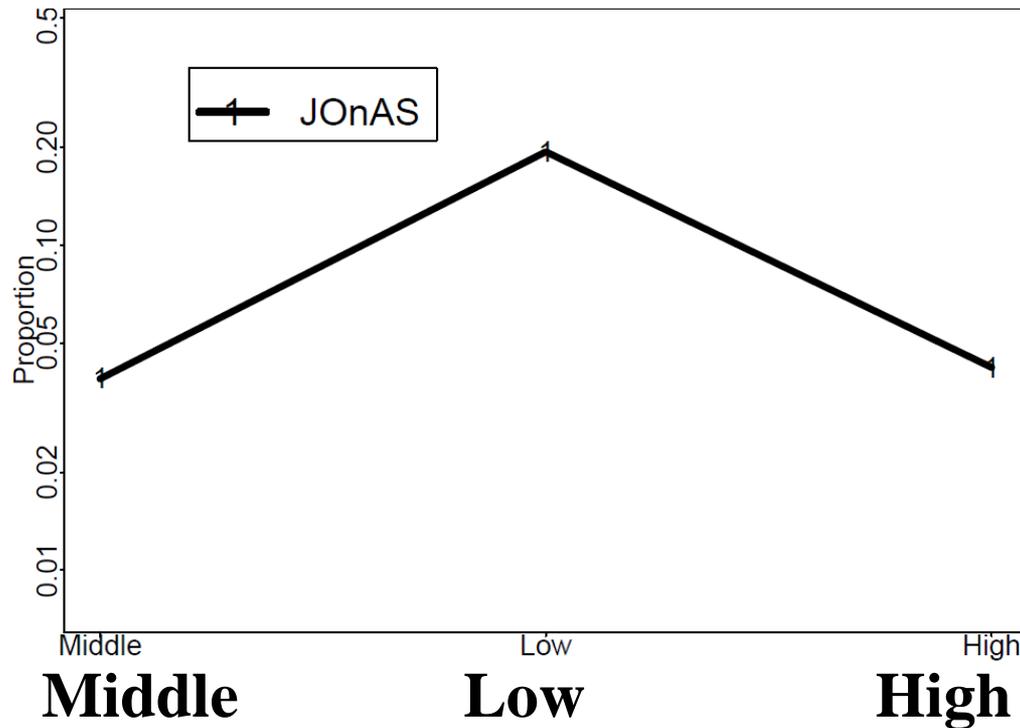
- ❑ *“Individual differences among project personnel accounts for the largest source of variation in project performance” Bohem, 81*
- ❑ The project practice trajectories that experts take, how learners develop coherent structures of information, the motivation



❑ How to help: tools supporting project learning

How the project environment when a developer joins affects her future?

Probability of becoming a long-term contributor (LTC)



Probability that a joiner will become an LTC for different initial social climates



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❑ How to help: tools supporting project learning



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