

Understanding and Supporting the Choice of an Appropriate Task to Start With In Open Source Software Communities

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Context

“Newcomers are explorers who must orient themselves within an unfamiliar landscape...”

[Degenais et al. 2010]



... and need support on their first steps

B. Degenais, H. Ossher, R.K.E Bellamy, M.P. Robillard and J.P. de Vries, **Moving into a new software project landscape**, in ICSE 2010.

Context

- **Open collaboration** communities leverage and depend on new contributors

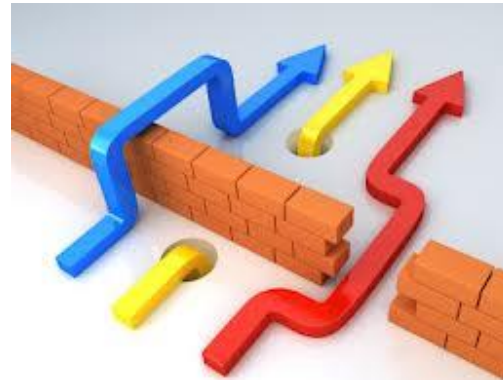
- Innovation
- Sustainability



- Ideally, open collaboration communities present a low barrier to entry
 - However...

Context

- Newcomers are susceptible to several barriers when they are onboarding
 - Learning curve
 - Coordination
 - Communication
 - Cooperation



Context

- **Open Source Software** communities are open collaboration communities
 - Newcomers are usually **developers** willing to place a contribution
 - Delivering a contribution is a complex, multi-step process
 - Multiple steps → multiple barriers → increase chance to giving up



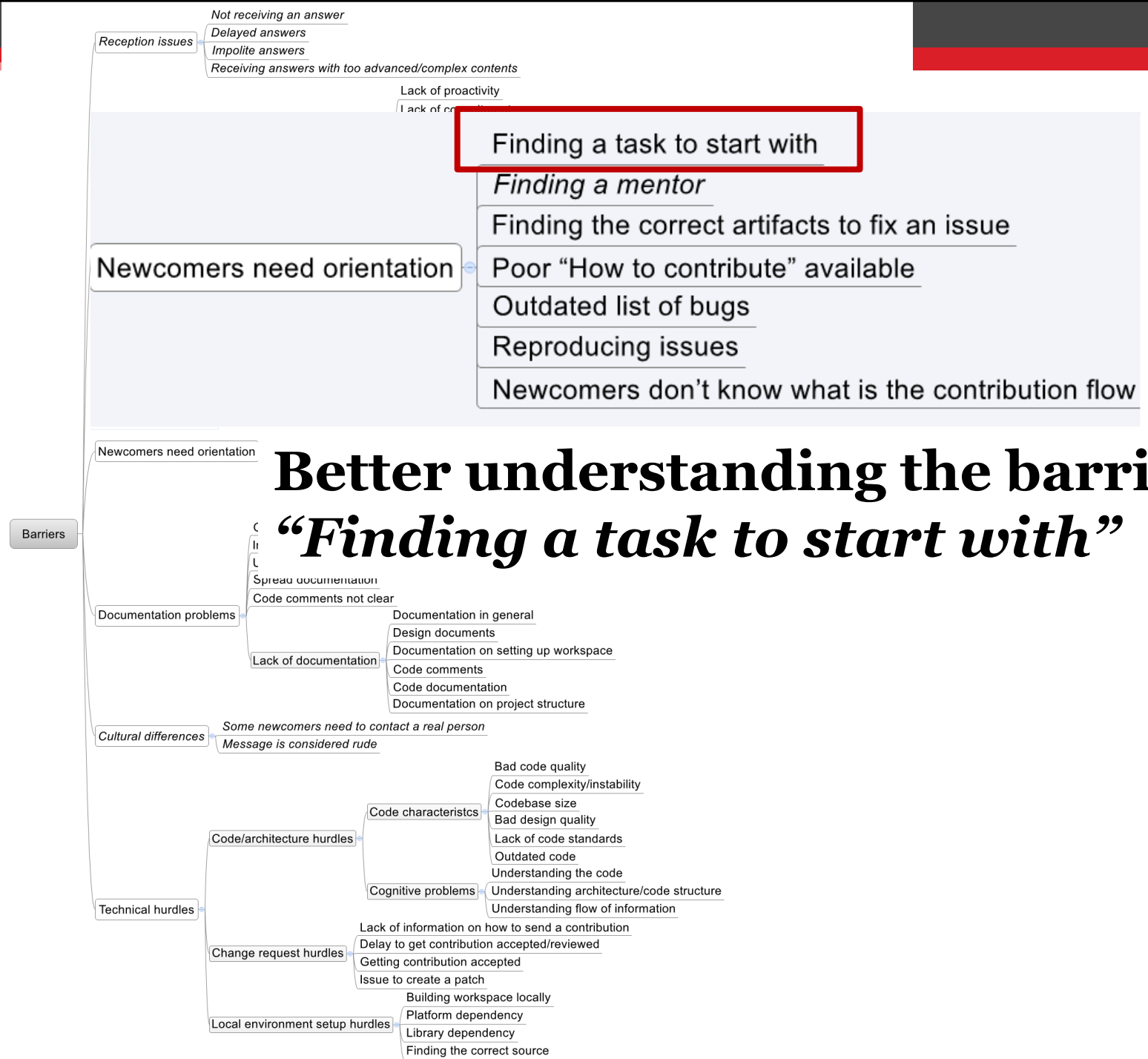
Scope

- Community-based OSS projects
- First contribution to a project
- Contribution → source code
- Newcomer → developer trying to place the first contribution

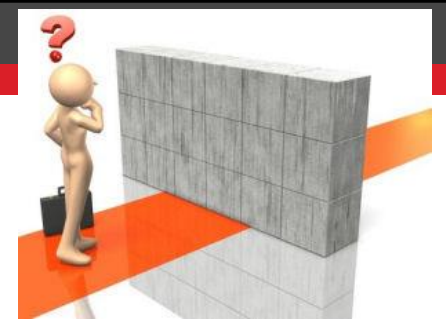
Goal

In a previous research, we identified 57 barriers faced by newcomers when onboarding to OSS projects from a **literature review**, a **survey** and **interviews** with OSS practitioners

“Finding a task to start with” was recurrently reported and highlighted by some interviewees



Finding a task to start with

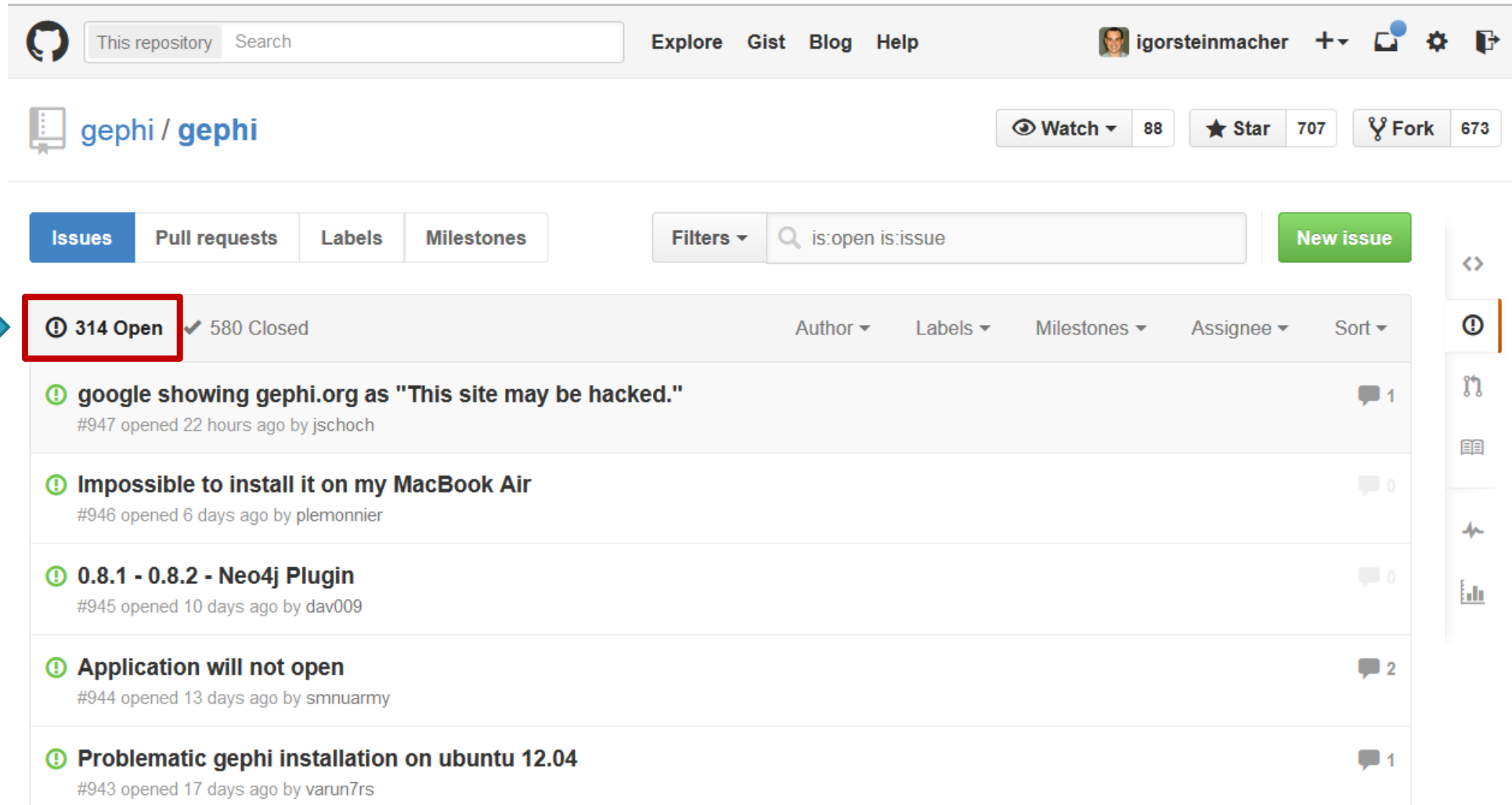


- It is hard to find an appropriate task in OSS communities, like:



- Scratch their own itch
- Find an existing task to accomplish
 - skills
 - complexity
 - high amount of tasks
 - outdated information

Finding a task to start with



This screenshot shows the GitHub interface for the 'gephi/gephi' repository. The 'Issues' tab is selected, and the search filter 'is:open is:issue' is applied. A blue arrow points to the '314 Open' status, which is highlighted with a red box. The list of issues is as follows:

Issue Title	Status	Author	Created
google showing gephi.org as "This site may be hacked."	Open	jschoch	22 hours ago
Impossible to install it on my MacBook Air	Open	plemonnier	6 days ago
0.8.1 - 0.8.2 - Neo4j Plugin	Open	dav009	10 days ago
Application will not open	Open	smnuarmy	13 days ago
Problematic gephi installation on ubuntu 12.04	Open	varun7rs	17 days ago

Finding a task to start with

moodle

DOCUMENTATION

DOWNLOADS

Summary

Issues

Road Map

Agile

Change Log

Reports

Versions

Components

Test Sessions

Issues

All issues

Unresolved

Added recently

Resolved recently

Updated recently

Unresolved: By Priority

Priority	Issues	Percentage
Blocker	15	
Critical	238	<div></div> 3%
Major	1194	<div></div> 15%
Minor	6455	<div></div> 79%
Trivial	274	<div></div> 3%

[View Issues](#)

Unresolved: By Assignee

Assignee	Issues	Percentage
Aaron Barnes	33	
Adam Olley	1	

Status

Open

Peer review

Develop

Waiting

Problem

Waiting

Waiting

Tested

Closed

[View Issue](#)

Component	Issues
Accessibility	208
Activity completion	62
Administration	698
AJAX and JavaScript	210
Assignment	355
Assignment (2.2)	211
Authentication	241
Automated functional tests	62
Backup	354
Backup: IMS-CC	12
Badges	35
Blocks	284
Blog	48
Book	20
Caching	90
Calendar	140
Chat	72
Choice	44

Back to the goal

Better understanding the barrier “**Finding a task to start with**”
when a **newcomer** is trying to place their first **code contribution** to
Open Source Software projects

Method

- Systematic Literature Review
 - 20 primary studies
- Feedback from students after an assignment
 - 9 feedbacks
- Survey with practitioners
 - 24 answers
- Interviews with practitioners
 - 36 interviews

Reported finding a task as a barrier:

4 studies

6 students

3 answers

9 interviewees

Method - In-depth understanding

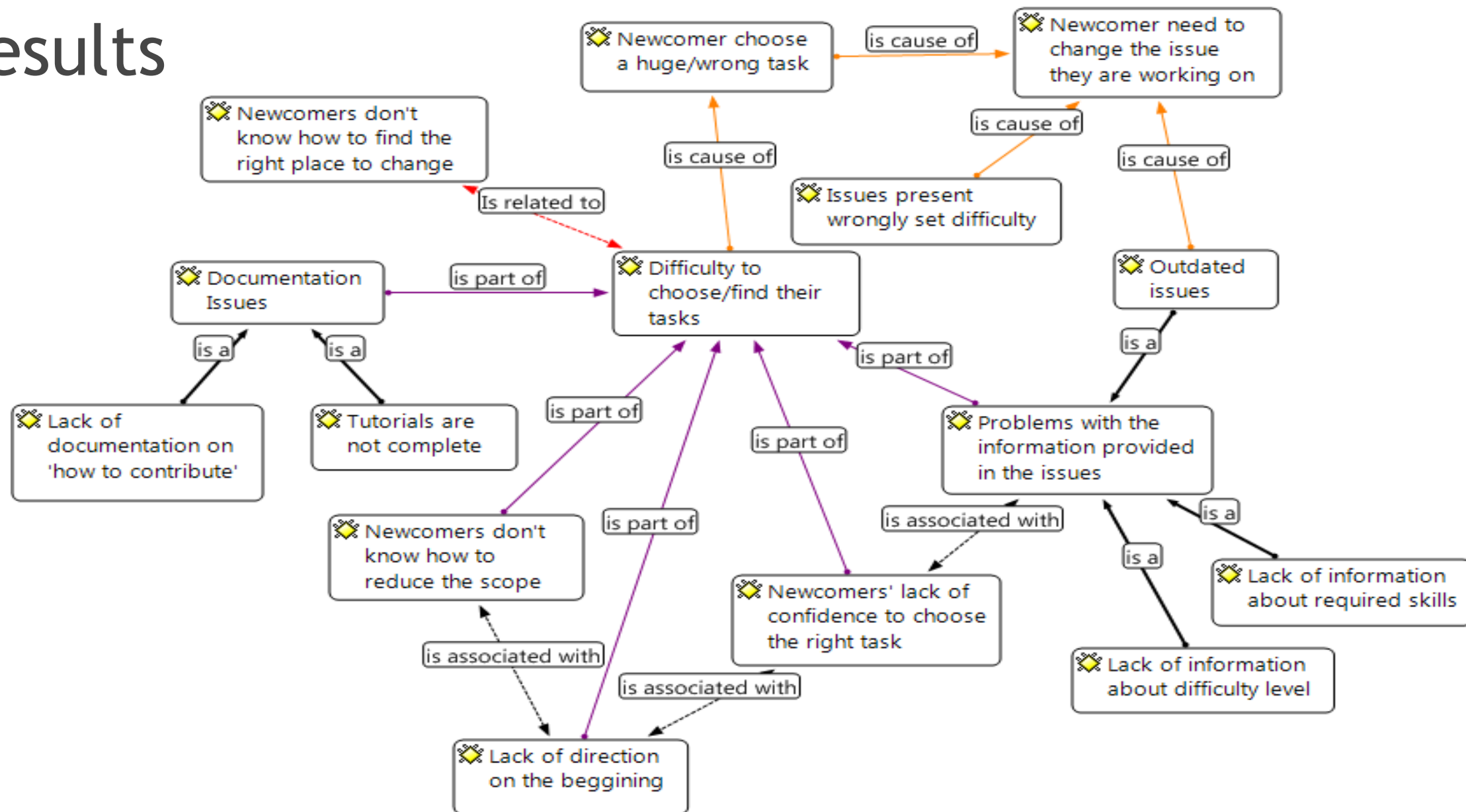
- Semi-structured interview with OSS practitioners
 - Recruitments → Email to mailing lists and forums of projects
 - 36 interviews
 - 11 experienced members
 - 16 newcomers that succeeded
 - 6 dropout newcomers
 - 3 newcomers that were still trying to place their first contributions
 - 14 projects
 - Text-based chat tools



Method - In-depth understanding

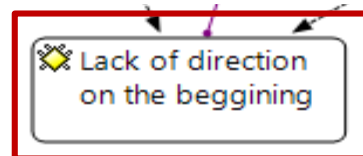
- Procedures of Grounded Theory to analyze the answers
 - Open coding + Axial coding
- 3 iterations
 - Iteration 1 → 36 interviews
 - What are the barriers that hinder newcomers' onboarding to OSS projects?
 - Iteration 2 → 6 interviews
 - Clarification of doubts and gaps found in Iteration 1
 - Iteration 3 → 5 in-depth interviews
 - Better understanding the barrier "*finding a task to start with*"
 - *Included a re-analysis of data*

Results



Results


- **Lack of direction at the beginning**
 - **Newcomers** expect that someone indicate them what are the tasks they should start with
 - *“We feel more secure when someone is guiding us. I think this is related to the experience with large projects and Open Source...”*
 - *“If I could have got some hand holding that might have helped...”*



Results

- **Lack of confidence**

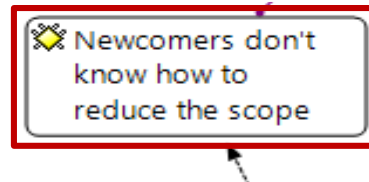
- **Newcomers reported** that they do not feel confident enough to choose the task they should choose and to handle it
 - *“I really didn’t know which one to pick, which one I was ‘authorized’ to pick... whether they are important.”*
 - *“A college colleague gave up... He did not find a task that he felt confidence to try.”*
 - *“it is frustrating, there is a bunch of issues, but I don’t have the proper knowledge to judge what exactly I can touch...”*

 Newcomers' lack of confidence to choose the right task

ted with

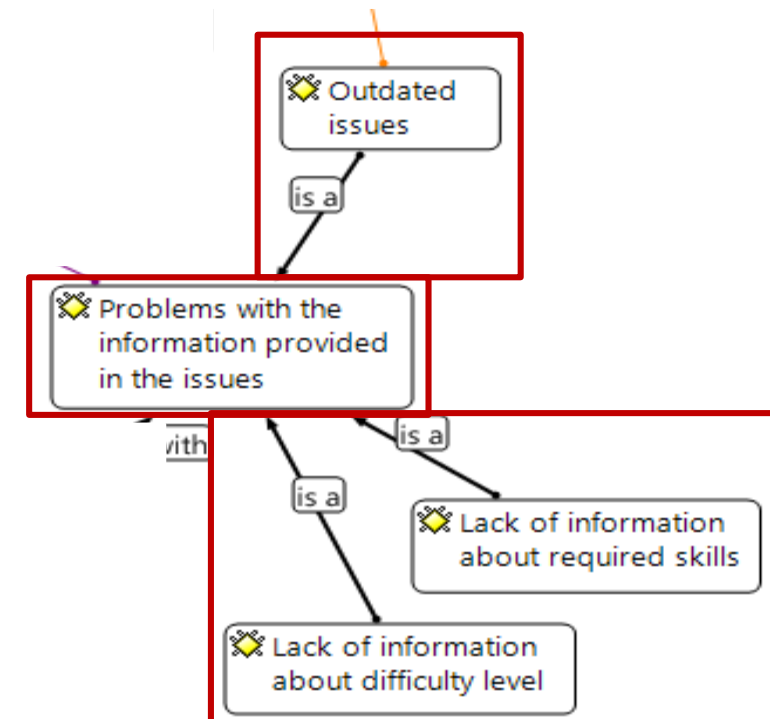
Results

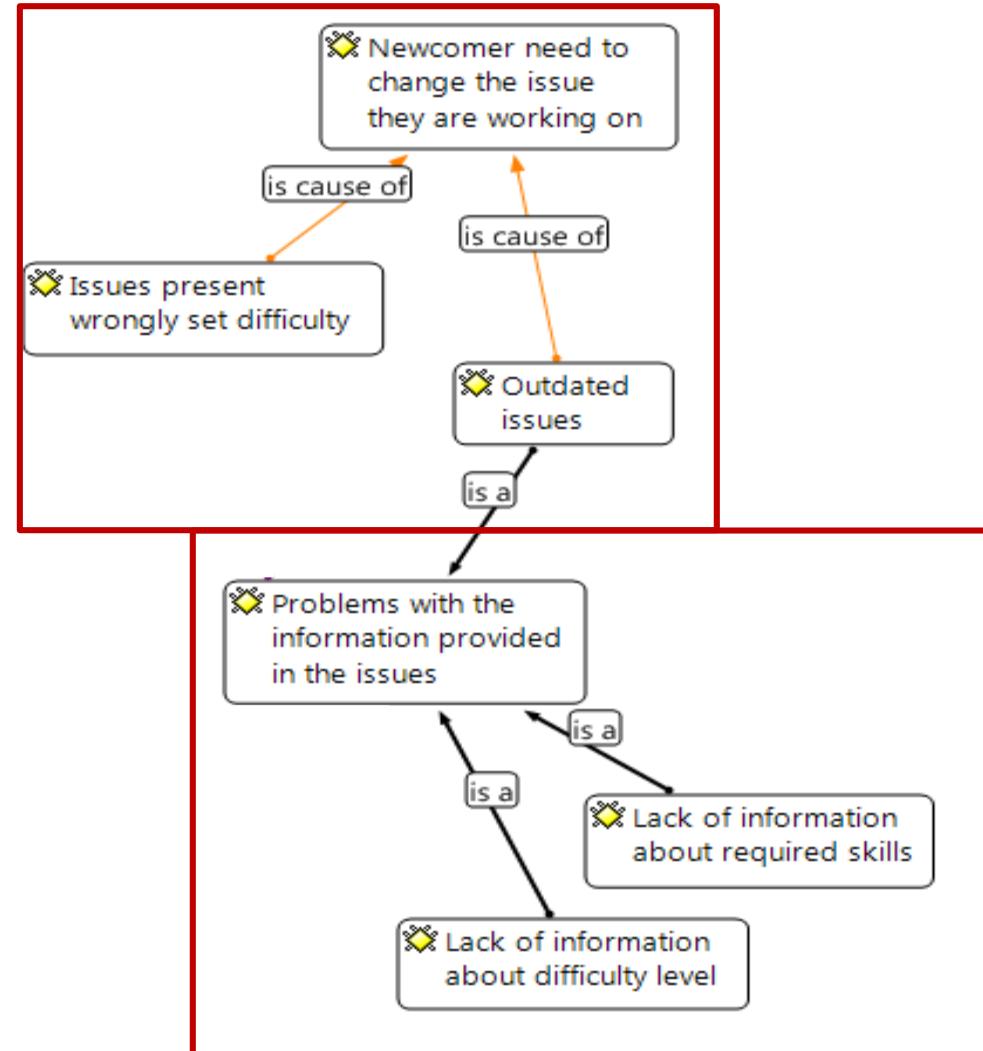
- **Newcomers do not know how to reduce the scope**
 - **Mainly reported by experienced members**
 - *“sometimes they want to contribute but don’t know how to reduce the scope when starting”*
 - *“the task chosen [by the newcomer] makes some sense, but is huge, and the newbie thinks she’ll be able to implement it in a few days.”*



Results

- **Problems with the information provided in the issues**
 - Recurrently reported by newcomers and experienced members
 - *“the issues that I can contribute were not clearly defined so it was my job as a newcomer to find out how to contribute there were no easy or junior bugs as in some projects.”*
 - *“the issues should indicate the area of knowledge, like C++, build, shell script”*

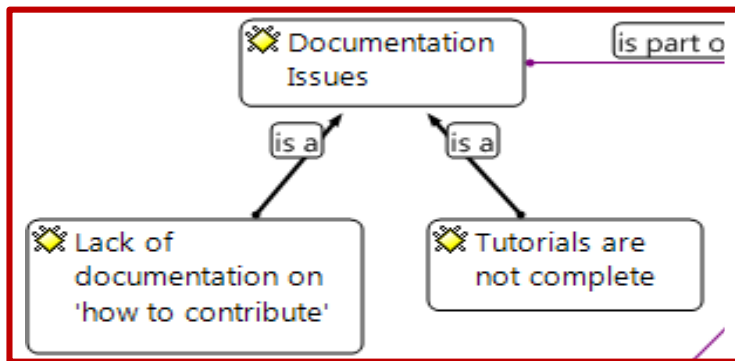




Results

- **Documentation Issues**

- *“there is no good guide for starter... I could not find how to choose a task”*
- *“A proper up-to-date guide with tutorials would have really helped. As in when I began, I was totally new to open source, but the tutorials skipped over certain instructions and I had no idea what I was doing wrong.”*



Existing solutions

- We looked for solutions:
 - Existing literature (systematic literature review)
 - Qualitative analysis in data from practitioners
 - State-of-the-practice
 - Manual analysis of 6 pages from 6 projects:
 - Mozilla
 - MediaWiki
 - Ubuntu
 - GNOME
 - Apache Open Office
 - Libre Office

Existing solutions (state-of-the-practice)

Strategy adopted	MediaWiki	Mozilla	Ubuntu	Gnome	Open Office	LibreOffice
Specific page (tutorial) for newcomers	•	•	•	•	•	•
List of easy tasks by difficulty	•	•		•	•	•
List of easy tasks by required skills		•				•
List of easy tasks by topic/subproject		•		•	•	•
List of mentored bugs		•				
Mentorship per subproject				•		
Form to send an email with your goals and skills requesting a task		•				

Identified solutions

Strategy	Literature	Identified in Qualitative Analysis		State- of-the- practice	Can solve (hypotheses)
		Suggestion	Existing		
Specific page (tutorial) for newcomers		•	•	•	Documentation issues
List of easy tasks by difficulty	•	•	•	•	Problems with information provided in the issues Lack of confidence to choose a task
List of easy tasks by required skills				•	Problems with information provided in the issues Lack of confidence to choose a task
List of easy tasks by topic/subproject				•	Problems with information provided in the issues Lack of confidence to choose a task
List of mentored bugs		•		•	Lack of direction on the beginning Lack of confidence to choose a task Newcomers don't know how to reduce the scope
Mentorship per subproject		•		•	Lack of direction on the beginning Lack of confidence to choose a task Newcomers don't know how to reduce the scope
Form to send an email with your goals and skills requesting a task				•	Lack of direction on the beginning Lack of confidence to choose a task
Examples in the easy bugs		•			Problems with information provided in the issues Lack of confidence to choose a task
Recommend artifacts that can be related to the issues	•				Problems with information provided in the issues Lack of confidence to choose a task Newcomers don't know where to place the changes
Recommend similar bugs and					

Conclusions

- Finding a task to start is complex and depends on many variables
- Lack of confidence to choose a task appeared as a relevant concept in our analysis.
 - Newcomers need to be properly guided
 - Support their decision about which task is more suitable

Conclusions

- We identified some already existent and suggested strategies
 - Some are already used
 - Applying appropriate filters
 - newcomers can find a subset of tasks that can fit their goals, interests and skills
 - Pointing them a possible mentor
- Strategies found in the literature were not identified in any project or interview
- We conceived a portal to support newcomers on their first steps:
 - **www.flosscoach.com**

THANKS!

The author are deeply sorry they could not get funds to attend the conference and present the paper

Questions, concerns and suggestions are **very welcome**.
Please direct them to:

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