



---

# What do Developers Discuss about Code Comments?

---

Pooja Rani, Mathias Birrer, Sebastiano Panichella  
Mohammad Ghafari, Oscar Nierstrasz

University of Bern, Switzerland

# Code Comment

```
/** Event fired when a spacer element is hidden or shown in Escalator
 *
 * @author Vaadin Ltd
 * @since 7.7.13
 */

public class SpacerVisibility {
    System.out.println(..);
}
```

Developers use comments to understand and maintain code.

# Code Comment

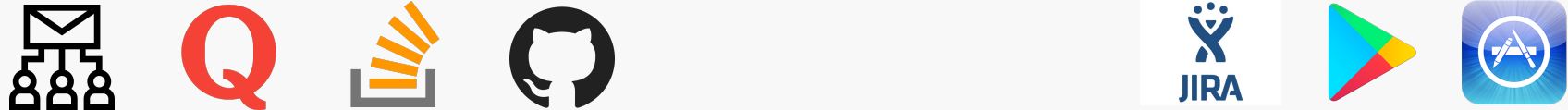
- Style & Syntax is not enforced by compiler
- Different conventions for Languages, Companies, Projects, Developers
- **Confusion amongst developers**

# Developers' Information Needs

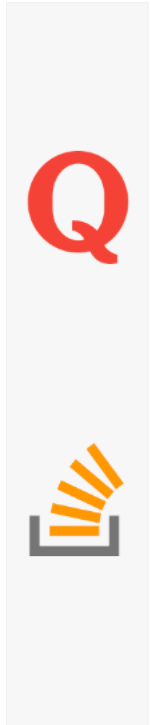
Internal Sources



External Sources

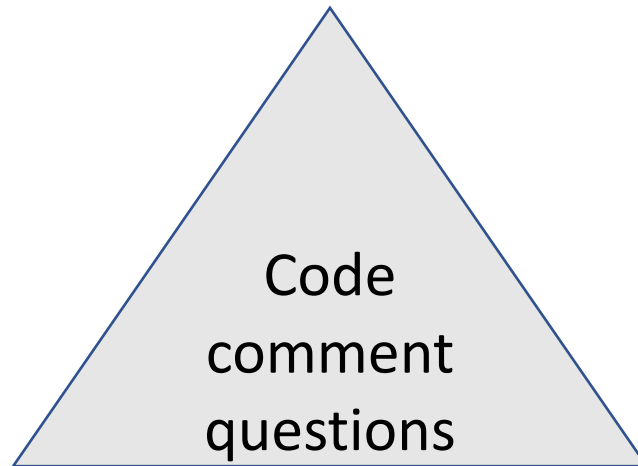
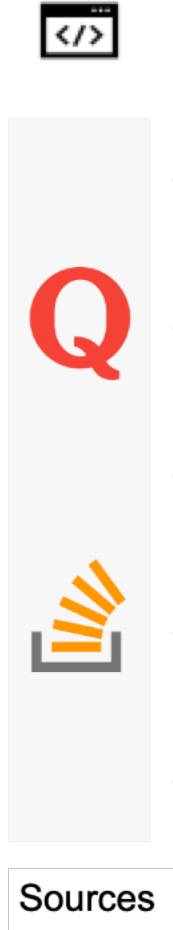


# What Do Developers Discuss about *Code Comments*?

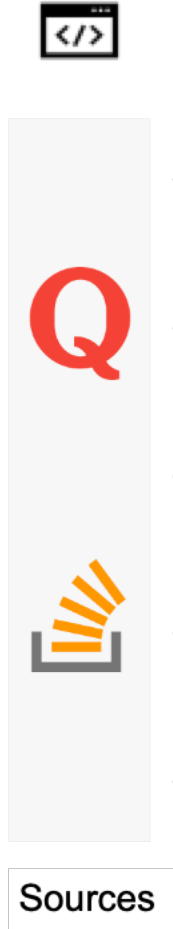


Sources

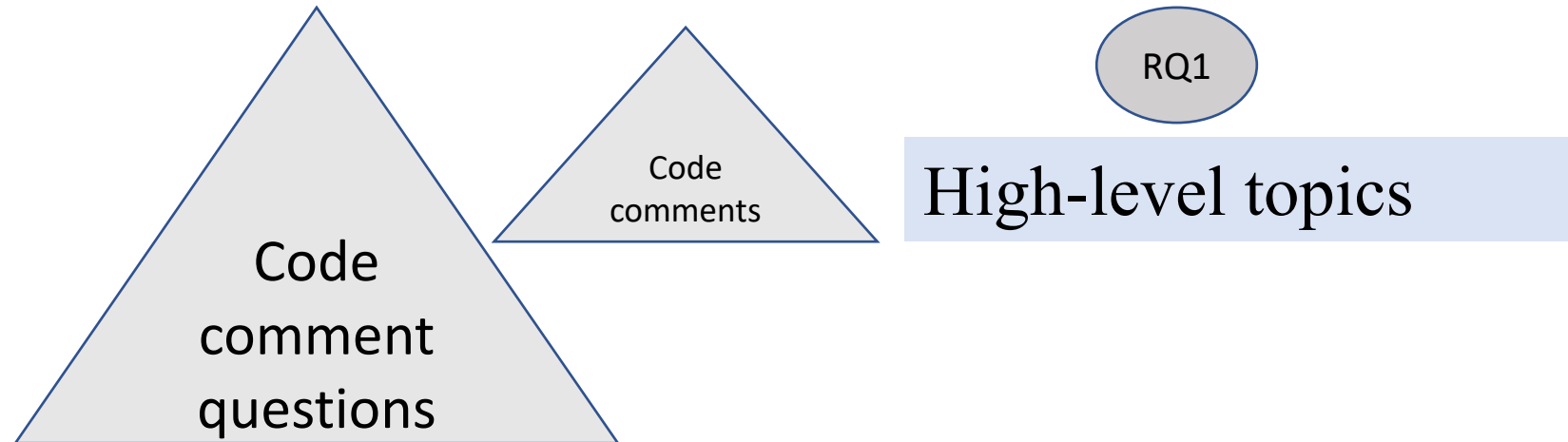
# What Do Developers Discuss about *Code Comments*?



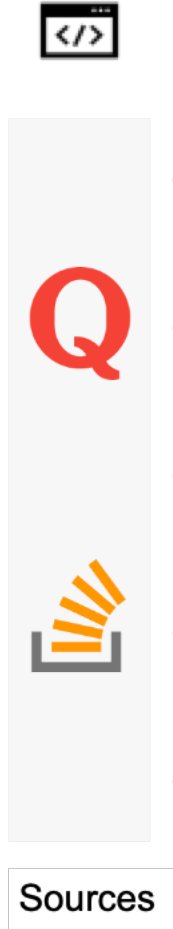
# What Do Developers Discuss about *Code Comments*?



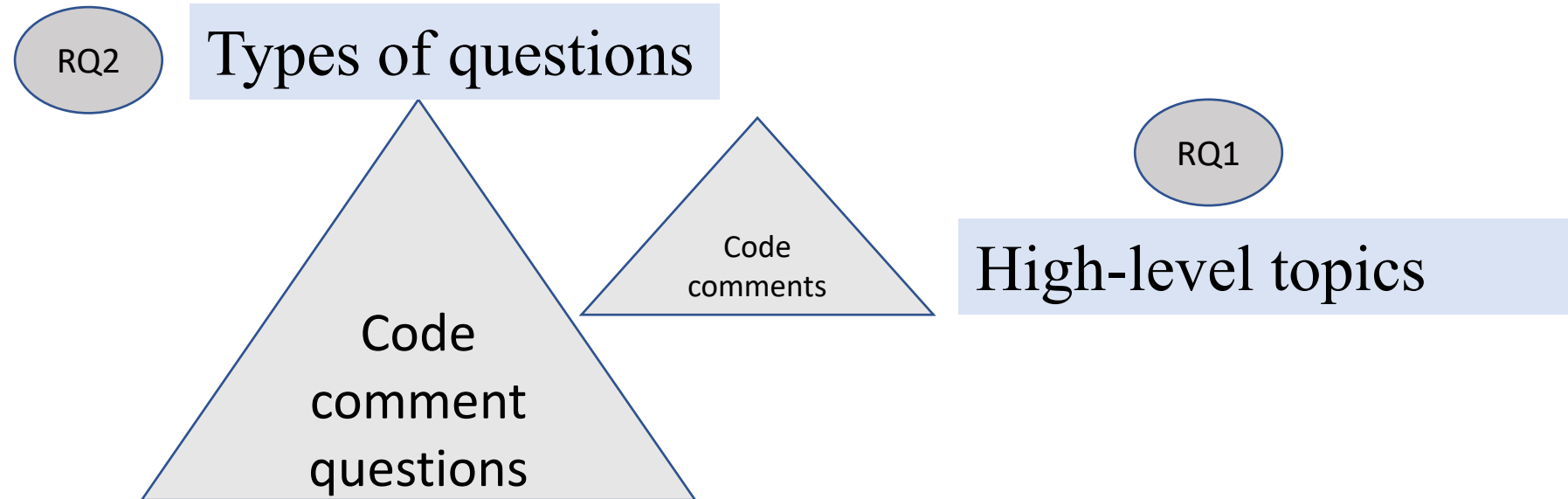
Sources



# What Do Developers Discuss about *Code Comments*?

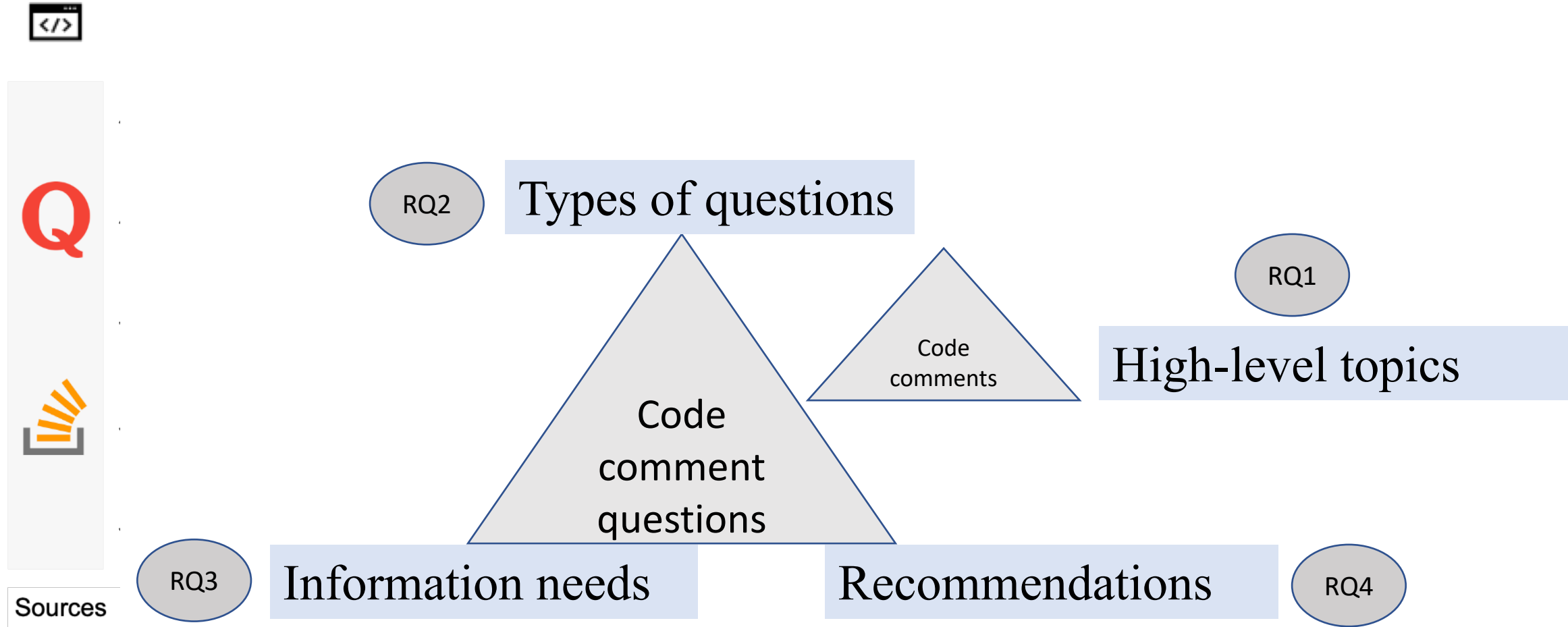


Sources

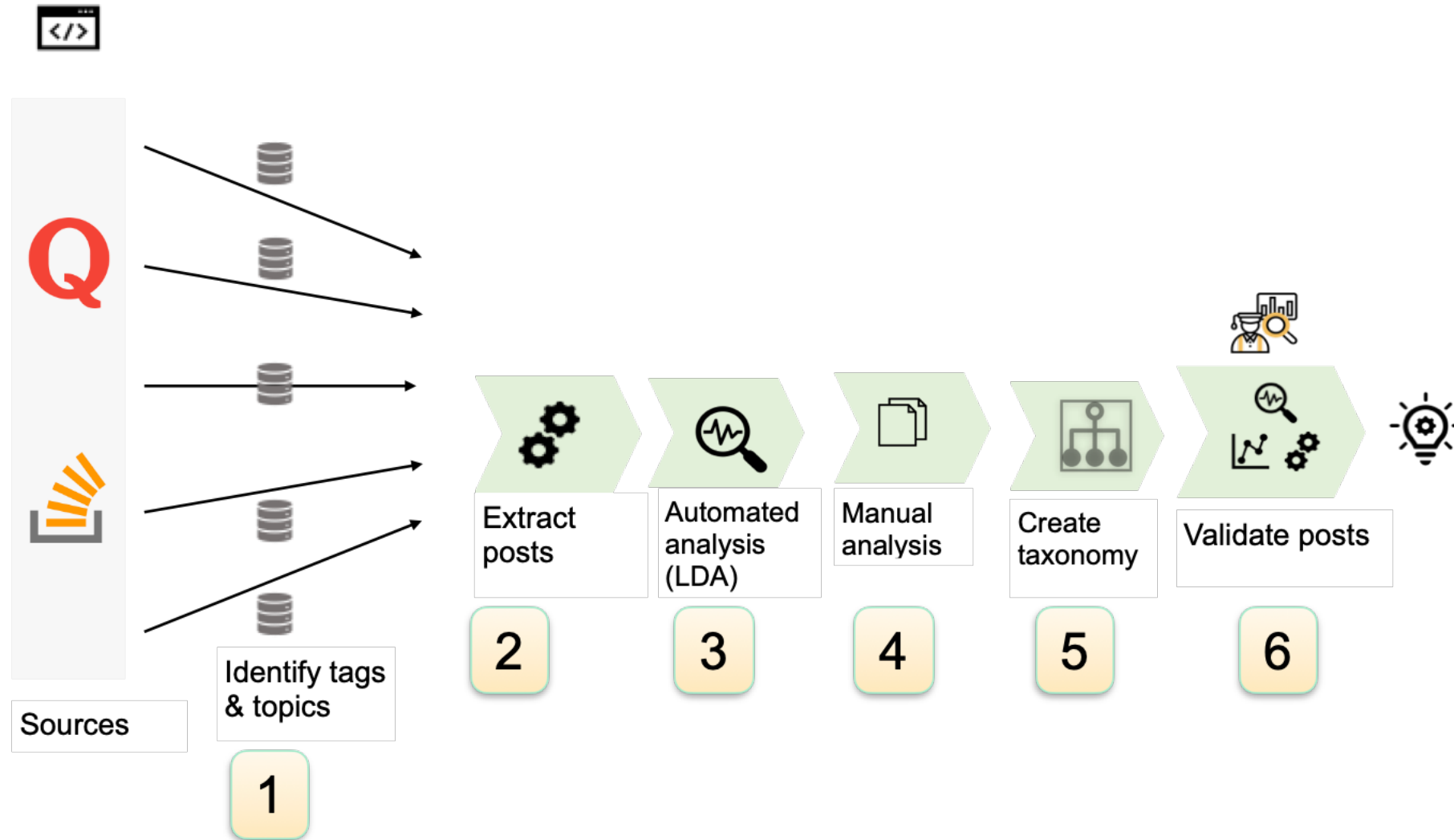




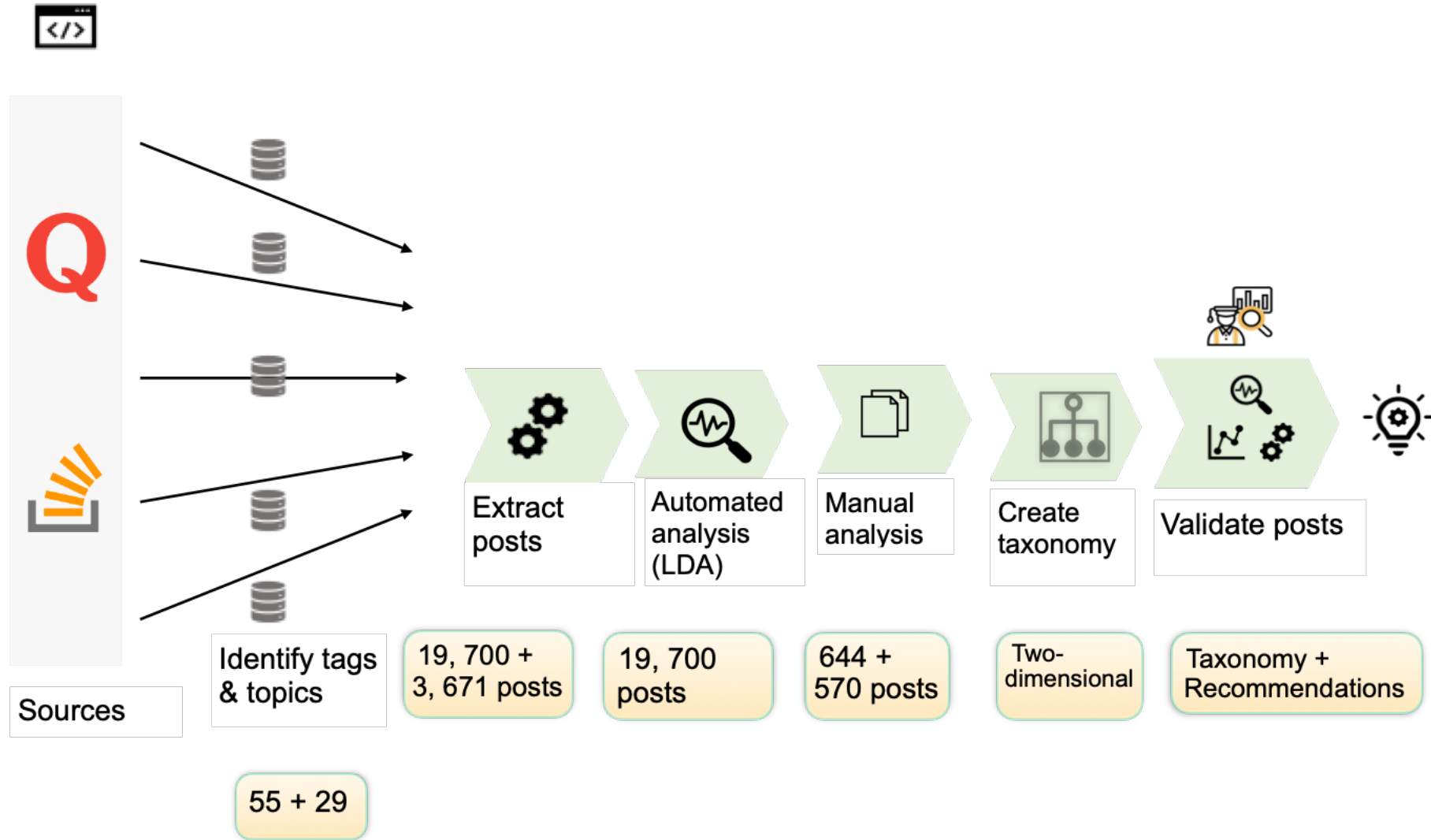
# What Do Developers Discuss about *Code Comments*?



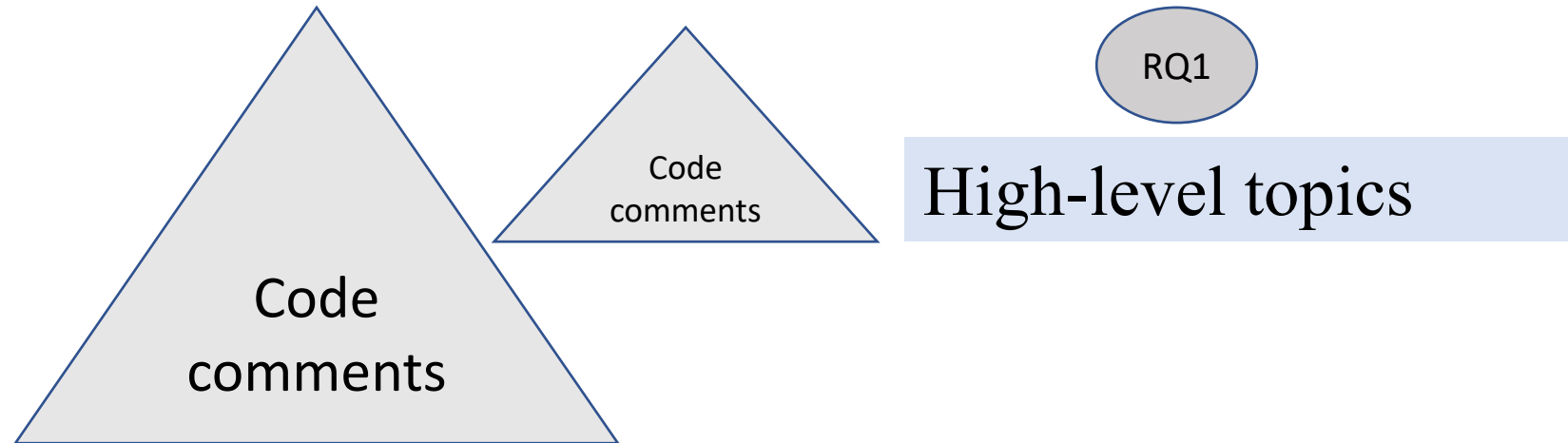
# What Do Developers Discuss about *Code Comments*?



# What Do Developers Discuss about *Code Comments*?



# What high-level topics do developers discuss?



# LDA Topic modelling



Automated  
analysis  
(LDA)

#	Topic Name
1	<b>Syntax &amp; Format</b>
2	<b>IDEs &amp; Editors</b>
3	<b>R Documentation</b>
4	<b>Code Conventions</b>
5	<b>Developing frameworks for thread commenting</b>
6	<b>Open-source software</b>
7	<b>Documentation generation</b>
8	<b>Thread comments in web-sites</b>
9	<b>Naming conventions &amp; data types</b>
10	<b>Seeking documentation &amp; learning language</b>

Expected topics like “Documentation Generation” or “Syntax & Format” were successfully identified by LDA.

# LDA Topics: Irrelevant Topics

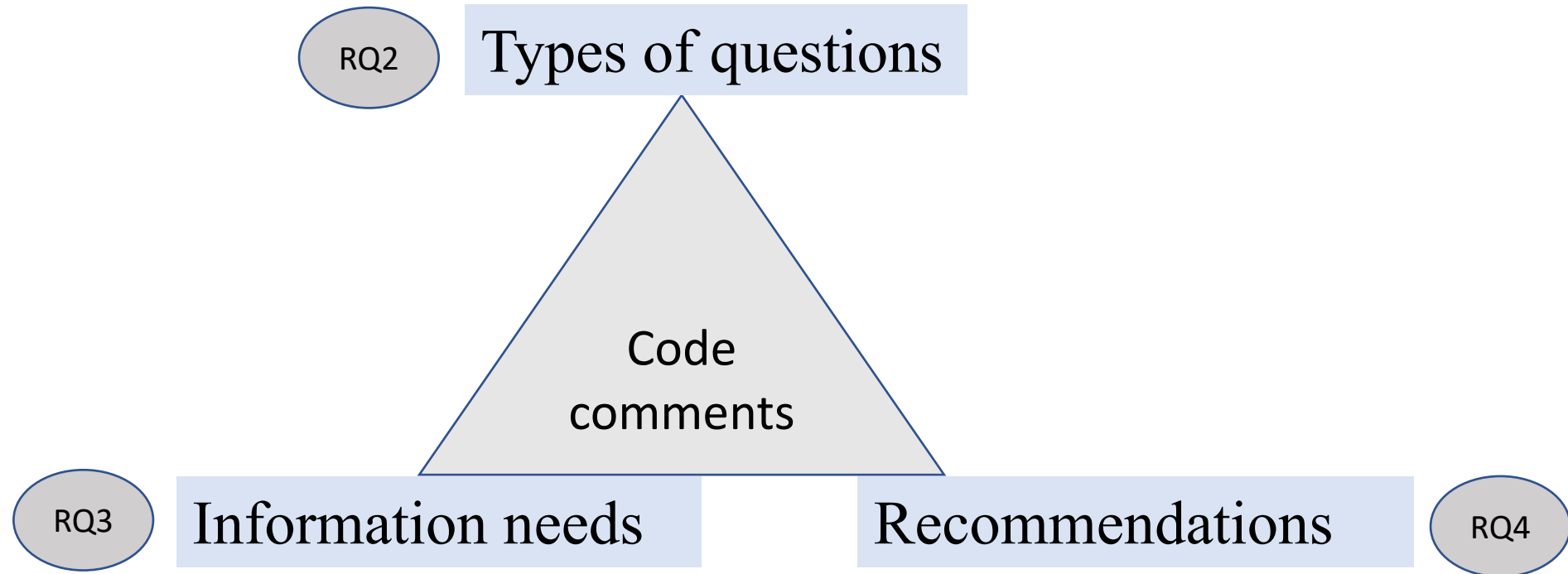
#	Topic Name
1	Syntax & Format
2	IDEs & Editors
3	R Documentation
4	Code Conventions
5	Developing frameworks for thread commenting
6	Open-source software
7	Documentation generation
8	Thread comments in web-sites
9	Naming conventions & data types
10	Seeking documentation & learning language

‘Comment’ term is used in various environment

# What Do Developers Discuss about “Code Comment”?



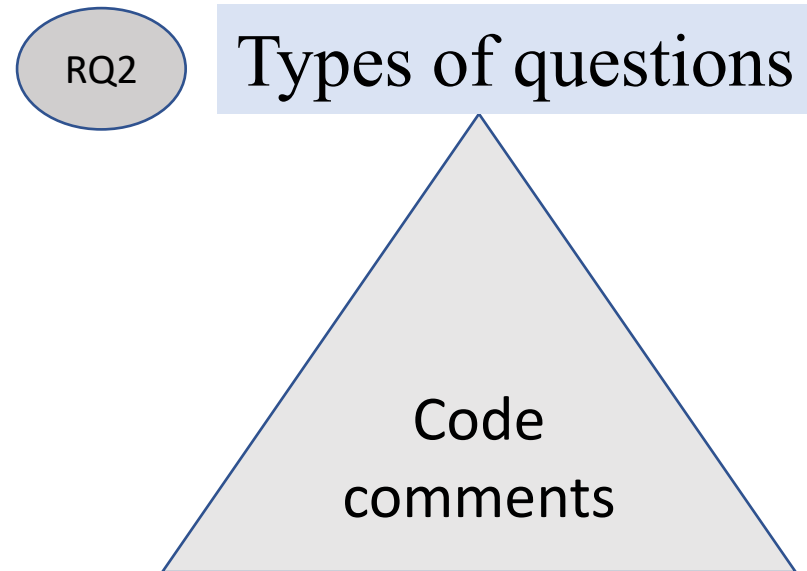
Manual analysis



# What Do Developers Discuss about “Code Comment”?



Manual  
analysis





# RQ2: Types of questions

2014 IEEE International Conference on Software Maintenance and Evolution

## A Manual Categorization of Android App Development Issues on Stack Overflow

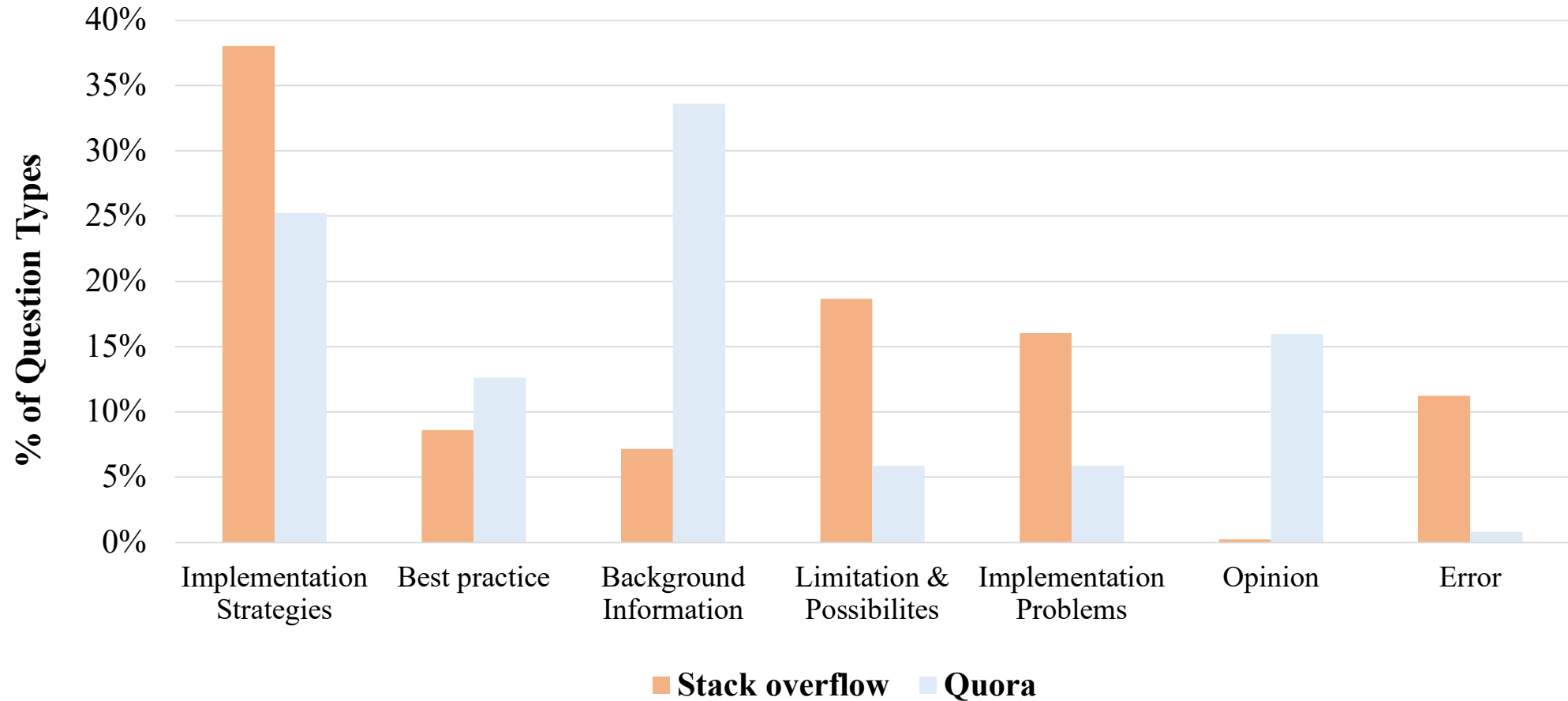
Stefanie Beyer  
Software Engineering Research Group  
University of Klagenfurt  
Klagenfurt, Austria  
Email: stefanie.beyer@aau.at

Martin Pinzger  
Software Engineering Research Group  
University of Klagenfurt  
Klagenfurt, Austria  
Email: martin.pinzger@aau.at

### First Dimension

- Implementation strategies *How to use @value tag in Javadoc*
- Implementation problems *The command does not work*
- Error *Contains an error message from the exception*
- Limitation & Possibilities *Is there a keyboard shortcut for block comments?*
- Background Information *Why is # usually introduces a comment?*
- Best Practice *What is the proper way to reference a element in Android comments?*
- Opinion *Are comments in code a good or bad thing?*

# RQ2: Types of questions



Developers prefer different sources to know different aspects of comments

# RQ3: Developer Information Needs

2019 IEEE/ACM 41st International Conference on Software Engineering (ICSE)

## Software Documentation Issues Unveiled

Emad Aghajani\*, Csaba Nagy\*, Olga Lucero Vega-Márquez†

Mario Linares-Vásquez‡, Laura Moreno‡, Gabriele Bavota\*, Michele Lanza\*

\**Software Institute, Università della Svizzera italiana (USI), Switzerland*

†*Systems and Computing Engineering Department, Universidad de los Andes, Colombia*

‡*Department of Computer Science, Colorado State University, USA*

### Second Dimension - Level 2

Syntax & format

Asking for features

Using features

Maintain  
comments

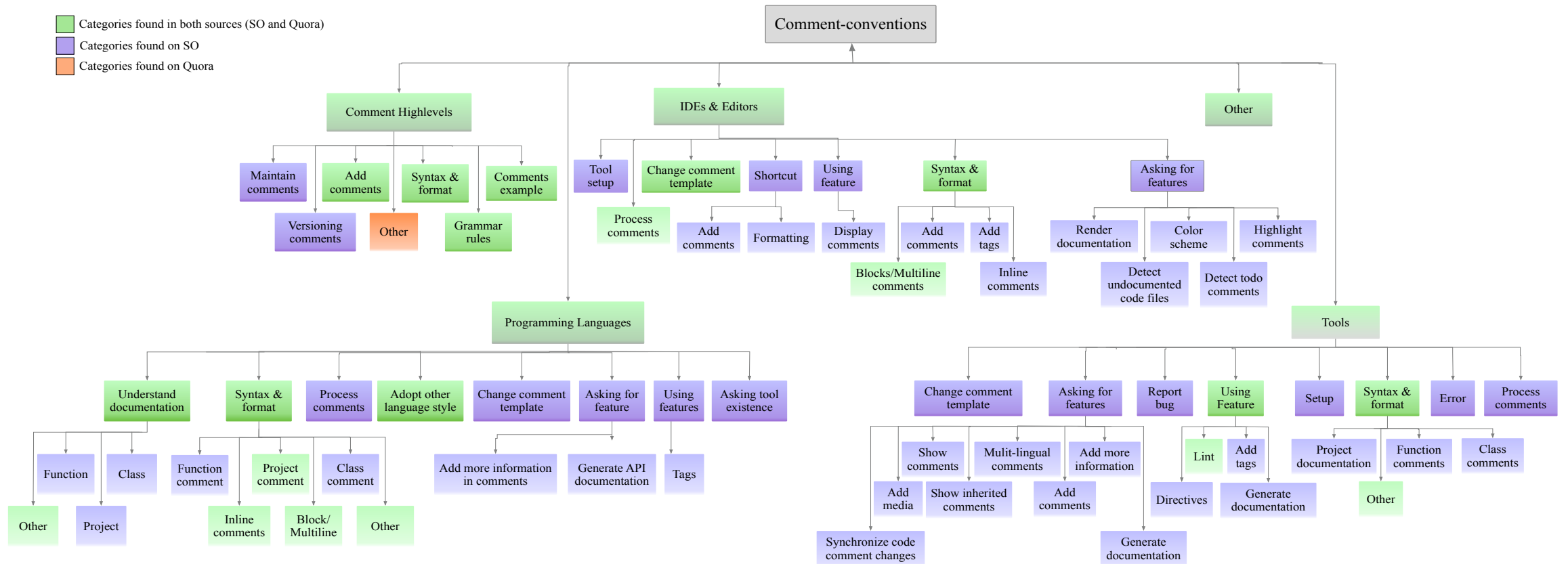
Understand  
documentation

Process comments

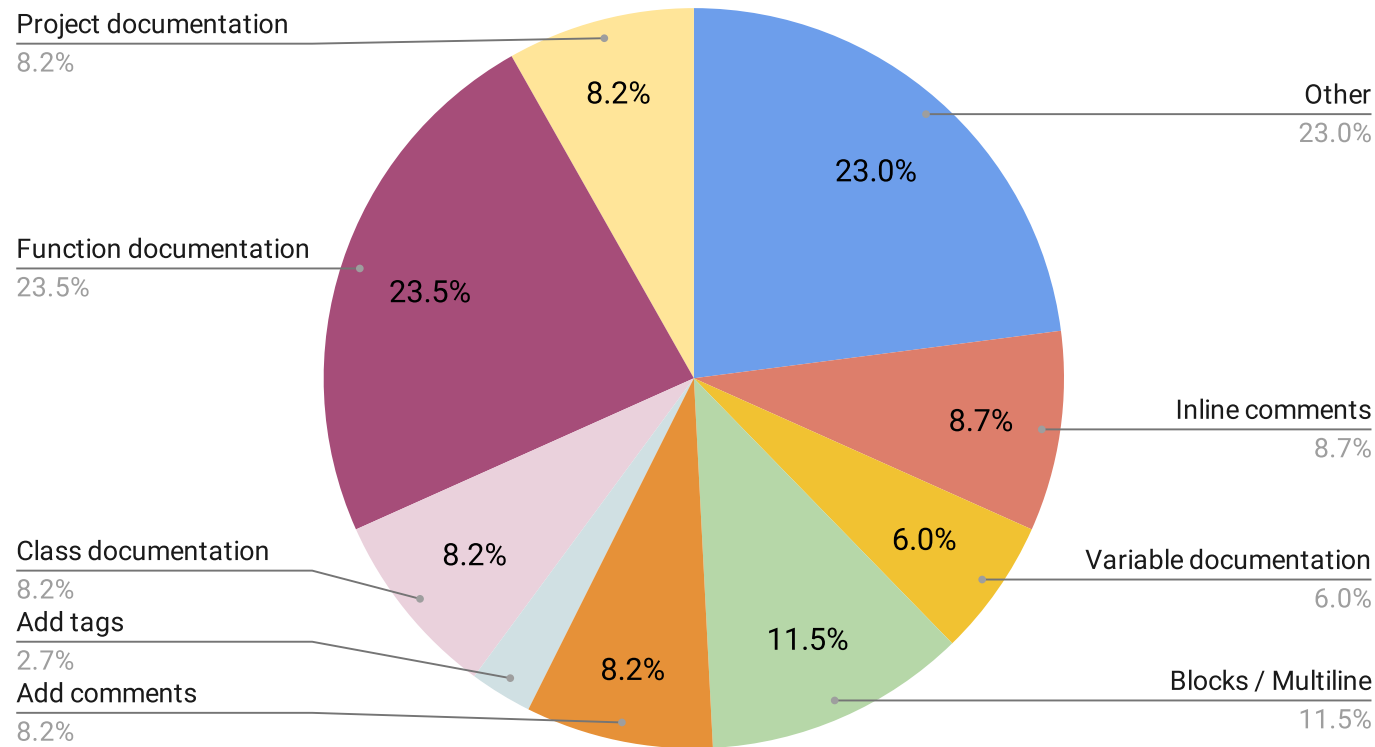
Change comment  
template

.....

# RQ3: Developer Information Needs

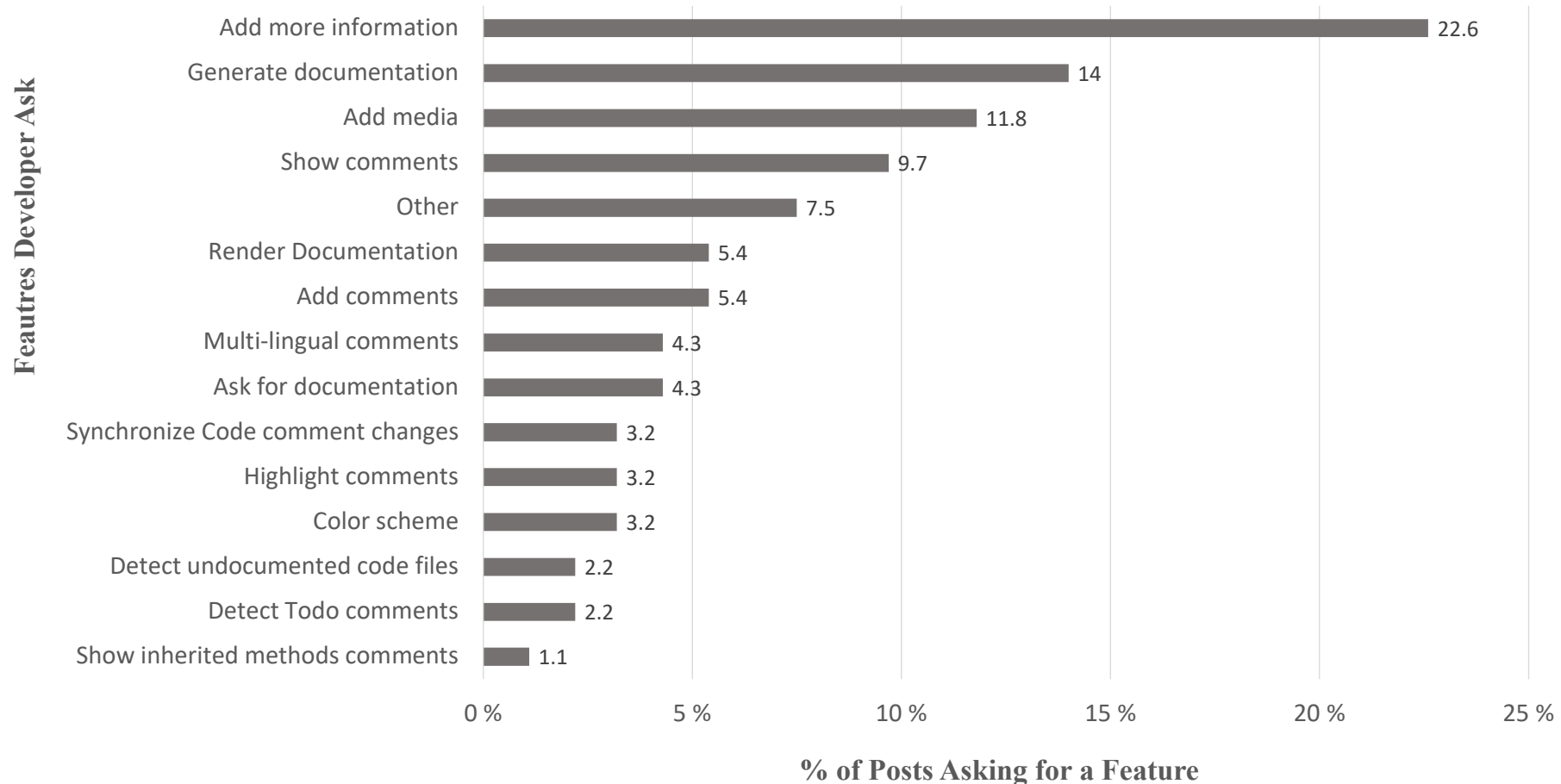


# Syntax & format



Increasing efforts and trend towards Function (API) documentation

# Asking for features



Developers are interesting in adding various information types in comments such as how to add images, examples in comments

# RQ4: Recommendations

*[.net] long inline comments should start with a capital letter and end with a period.*

*[general] Use correct notation to write block or multiline comments.*

We identified 40 comment conventions that developers recommend on these platforms

# Implication

Findings relevant for developers and researchers





# Implications



Need of automated style checkers

Some languages do not support automated style checkers



Adherence of comments to the conventions

To what extent developers follow commenting conventions



Tools to assess comment quality

Developers look for automated tools to assess the quality of their comments



Ease of finding commenting guidelines

Developers face problems in locating conventions

# Future Work

- Investigate more sources (e.g. GitHub, Jira, Mailing lists)
- Survey developers to know which concerns are more important than others
- Verifying the tool support to assess code comments



# What do Developers Discuss about Code Comments?

- Preprint on Arxiv

<https://arxiv.org/abs/2108.07648>

- Video on YouTube

<https://youtu.be/EUQINZ38ziU>

- Replication Package on Zenodo

<https://doi.org/10.5281/zenodo.5044270>



Contact us



<https://twitter.com/poojaruhal>



<http://scg.unibe.ch/staff>