Empirical user studies in semantic web contexts

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EKAW 2018

International Workshop on Visualization and Interaction for Ontologies and Linked Data

VOILA! 2015

VOILA! 2016

VOILA! 2017

VOILA! 2018

Special Theme 2018:
Empirical Research

What is the state of **empirical evaluation** in SW contexts?

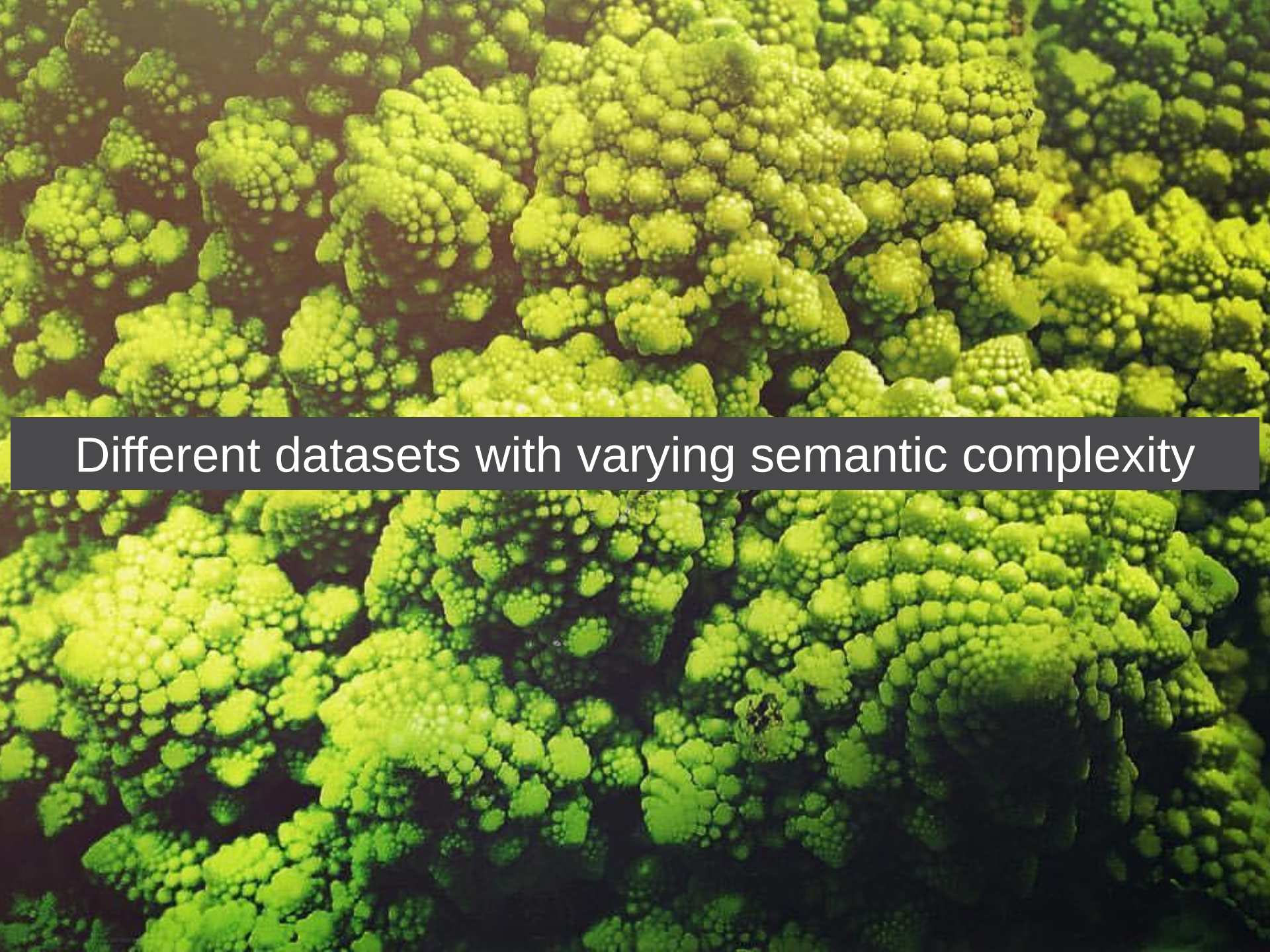
What is the state of **empirical evaluation** in SW contexts?

Can we help improve it?

Why are user studies **different** in Semantic Web?

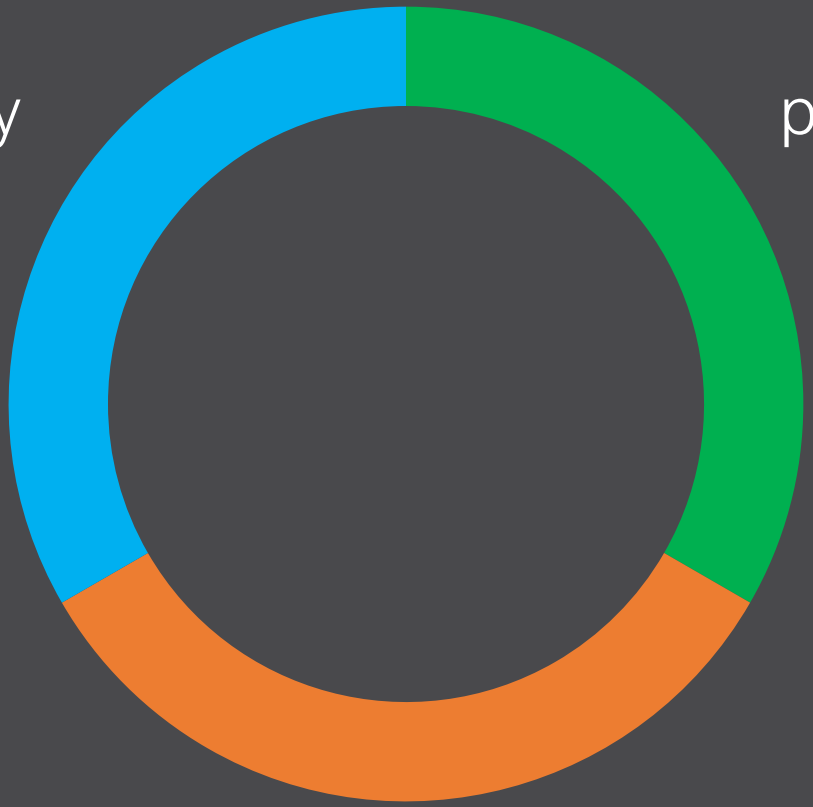
Knowledge Engineer vs. Domain Expert

Knowledge Engineering expert vs. novice


Different datasets with varying semantic complexity


Different users and datasets

external validity



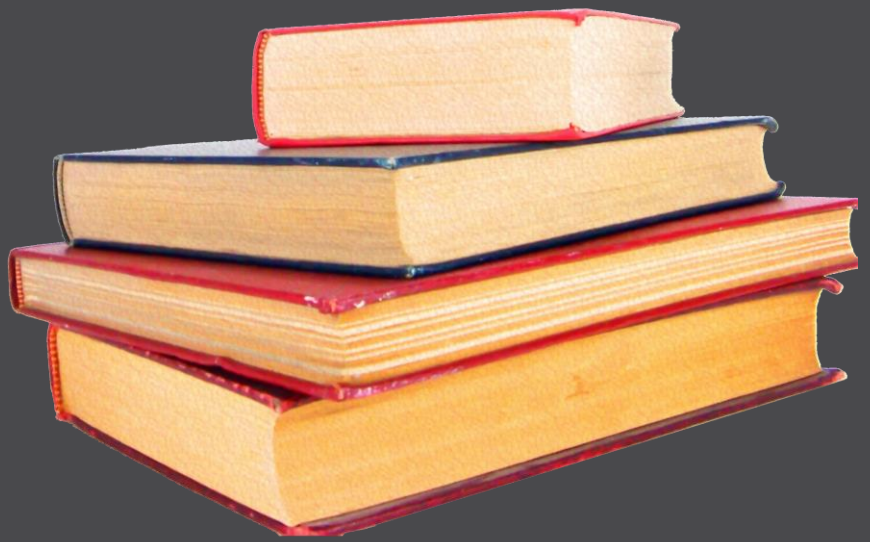
population validity

ecological validity

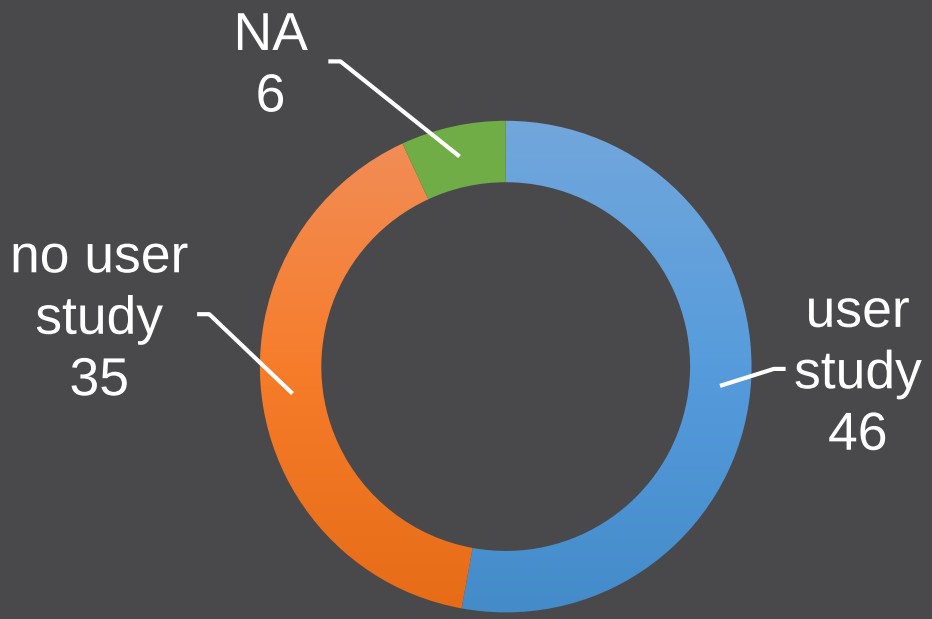
2015-2017

- ISWC (International Semantic Web Conference)
- ESWC (Extended Semantic Web Conference)
- VOILA (International Workshop on Visualization and Interaction for Ontologies and Linked Data)
- IESD (International Workshop on Intelligent Exploration of Semantic Data)

- “user study”
- “user evaluation”
- “empirical evaluation”
- “interaction”
- “visualization”



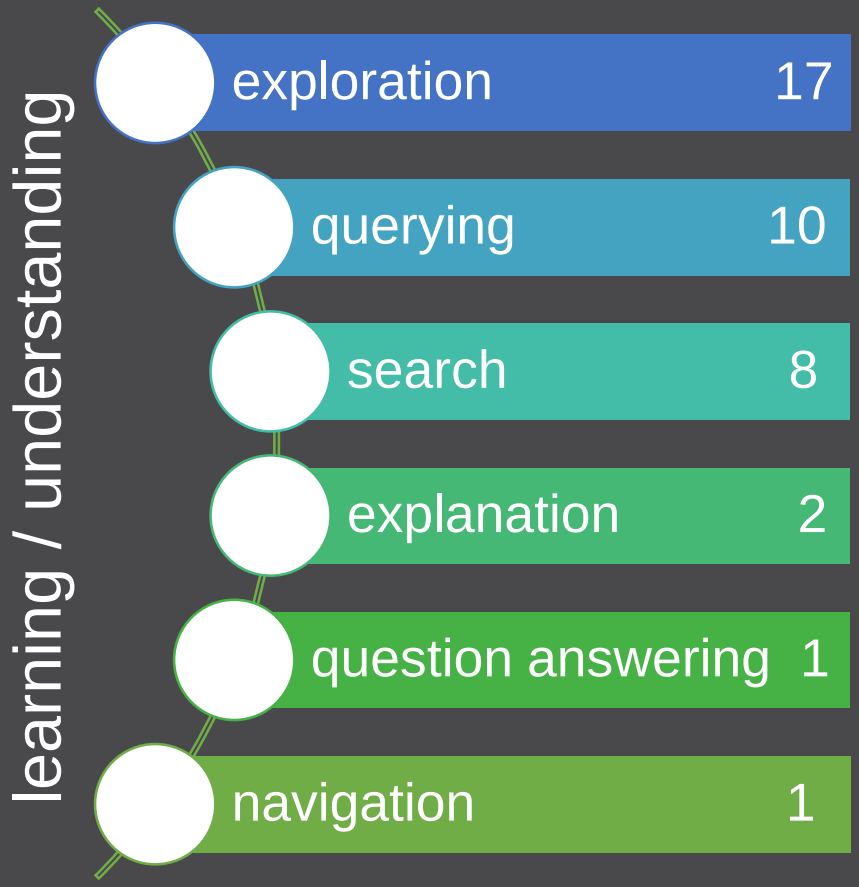
Literature review

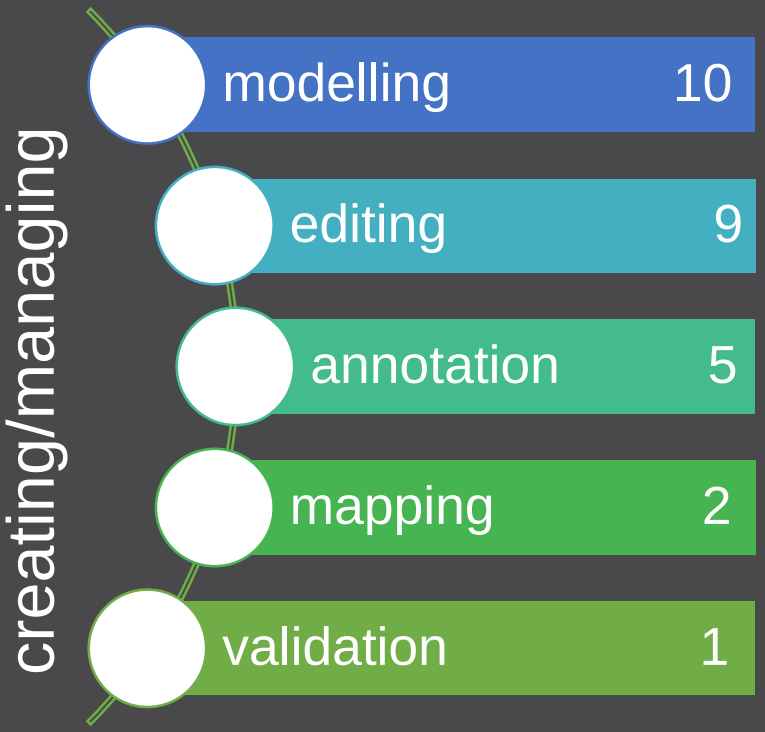


87 reviewed papers
46 user study papers were coded

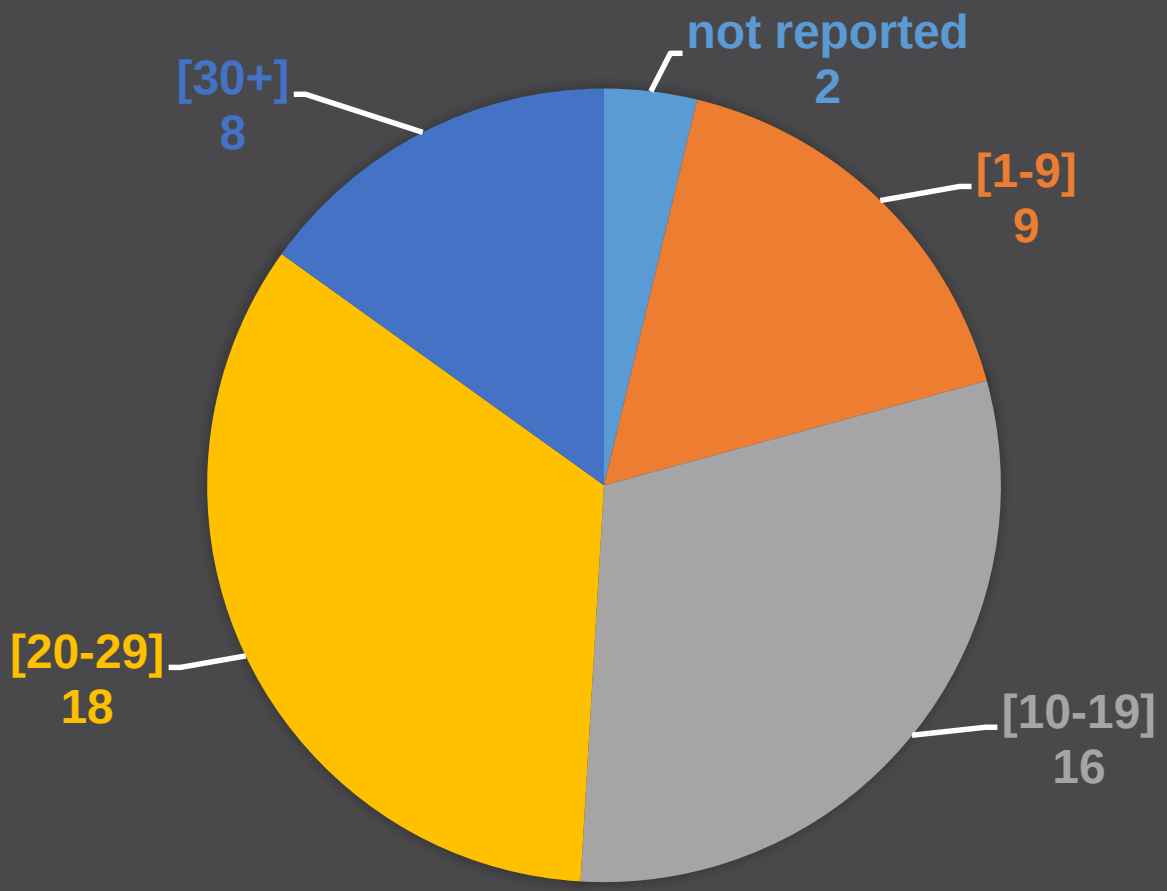
inductive analysis coding → purpose, users, evaluation methods → codes shared by all researchers → list of codes is revised → assigned codes checked by second researcher

Purpose

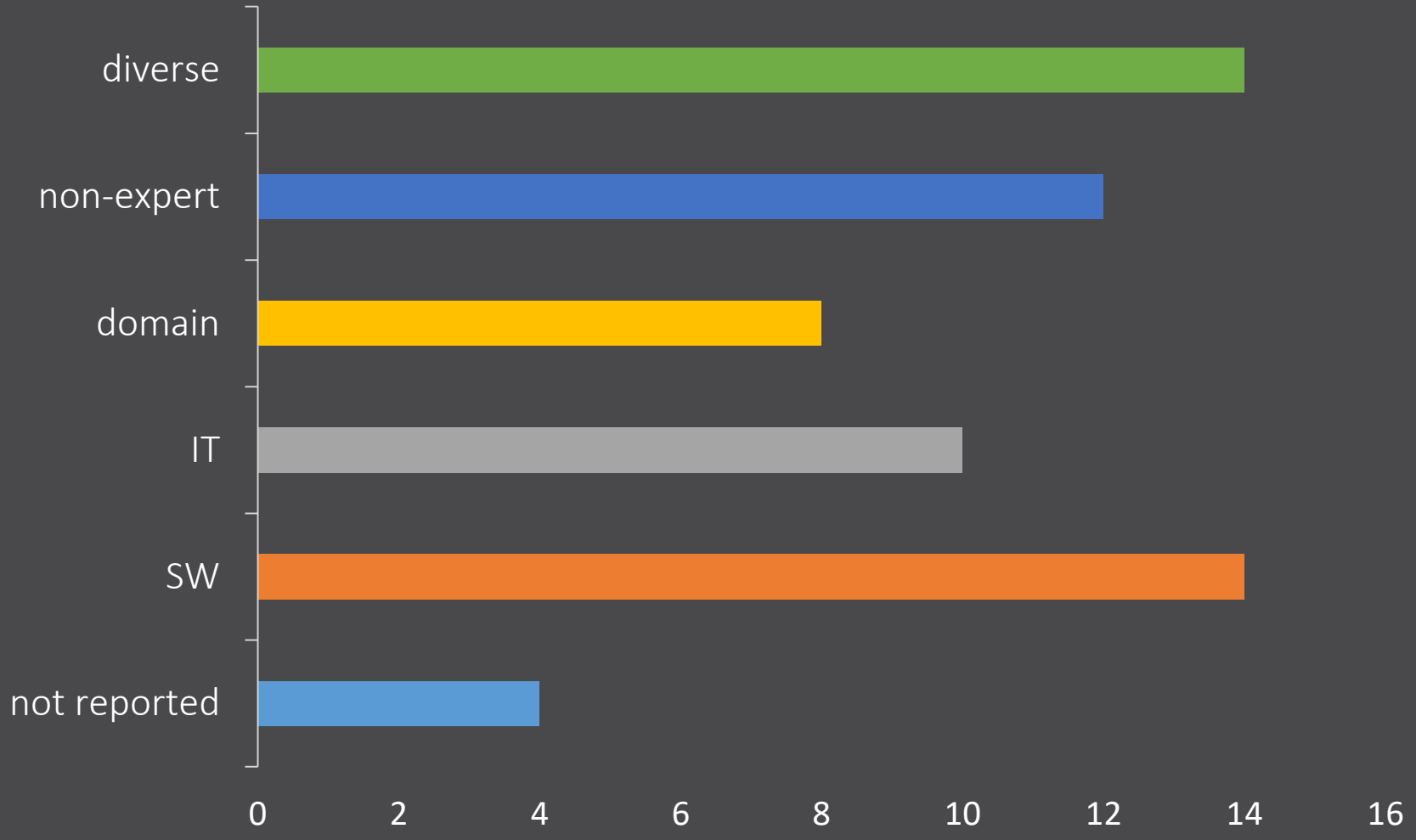

learning / understanding
exploration 17
querying 10
search 8
explanation 2
question answering 1
navigation 1


creating/managing
modelling 10
editing 9
annotation 5
mapping 2
validation 1

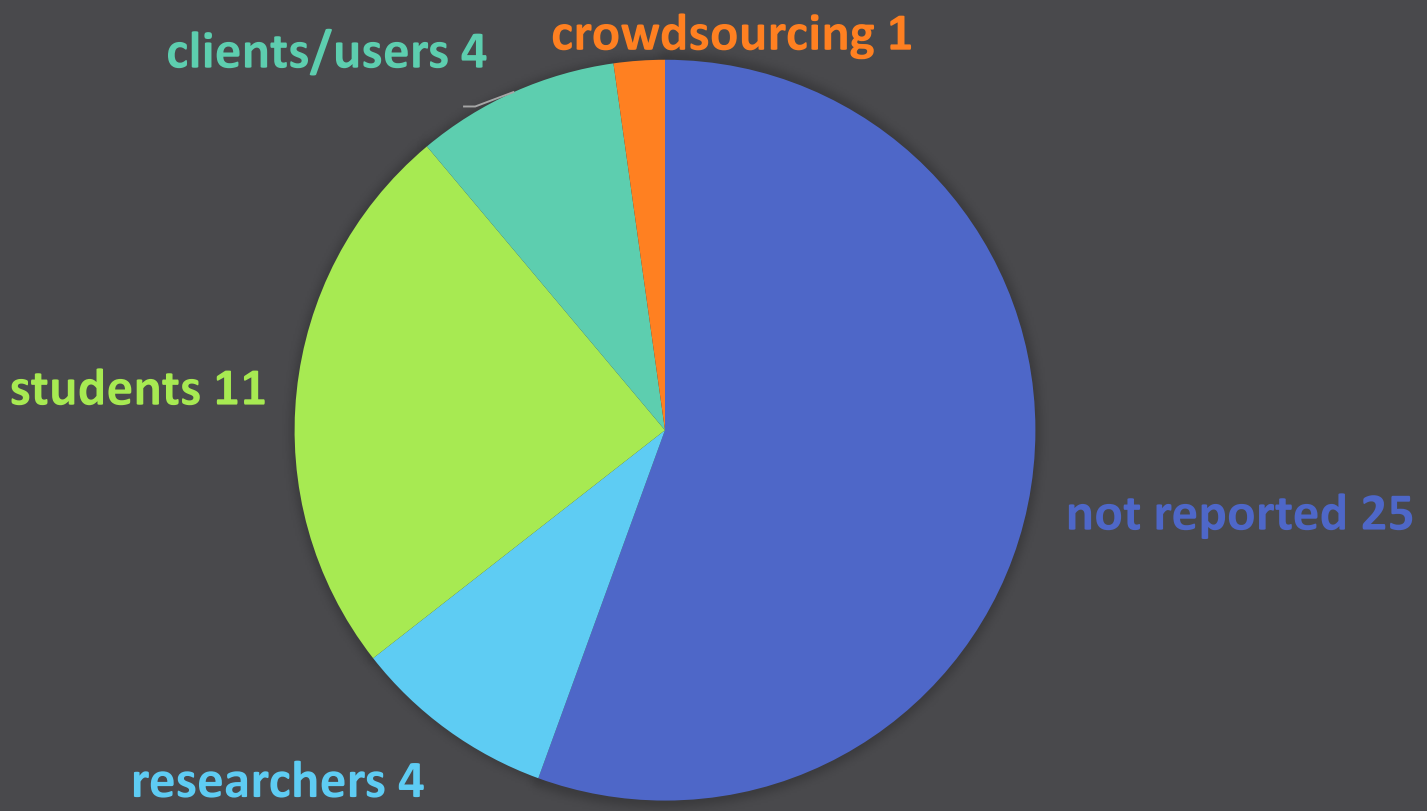
Number of users in reported study



Users expertise



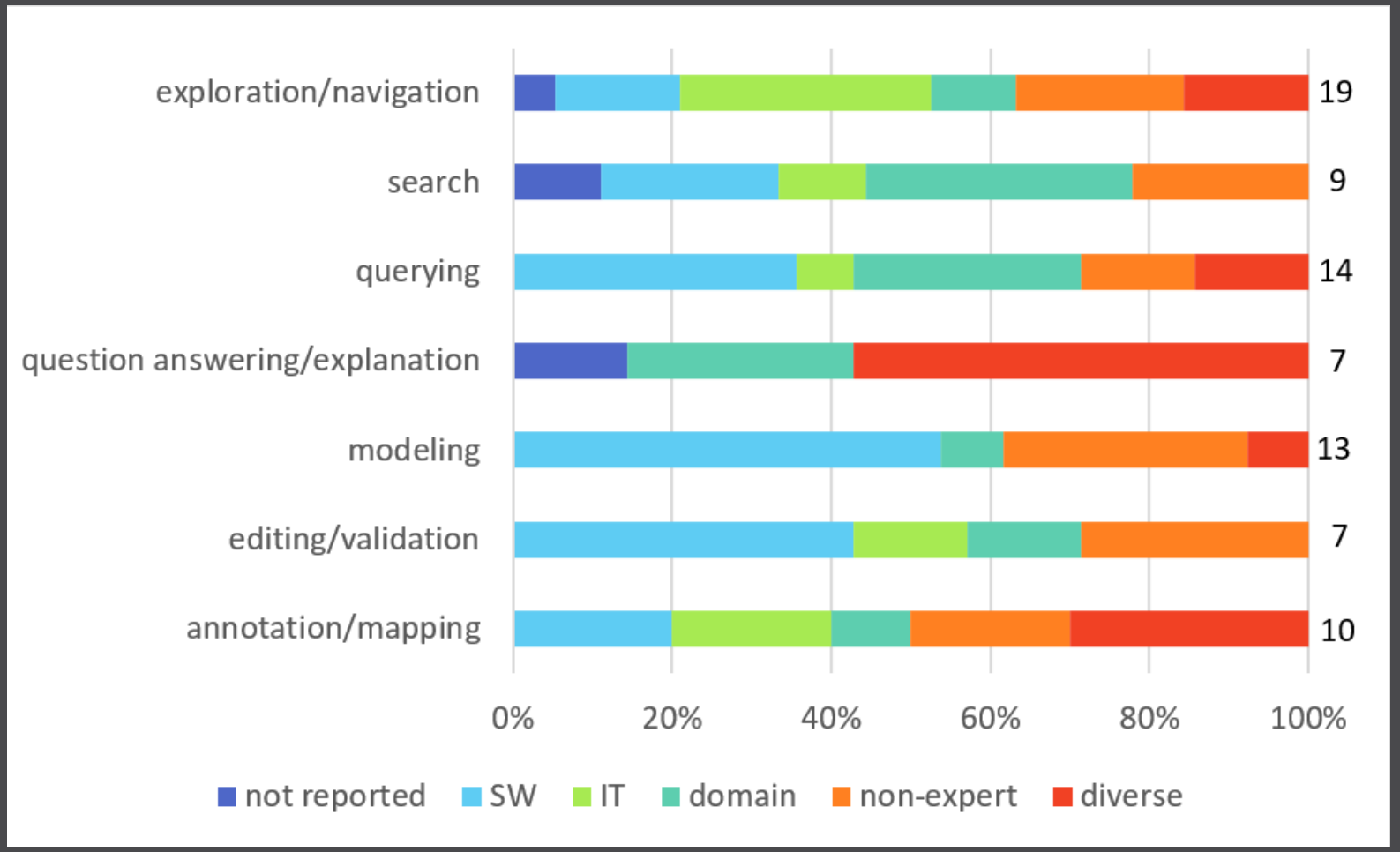
Users recruitment method



Evaluation Methods

- Qualitative 12
- Quantitative
  - Questionnaire
    - Standard 8
    - **Custom 21**
  - Task performance
    - **Success 10**
    - Time 2
    - **Success & Time 10**
    - Non-tracked 3
  - Design
    - Comparative within subjects 5
    - Comparative between subjects 3

User expertise by type of purpose and operation

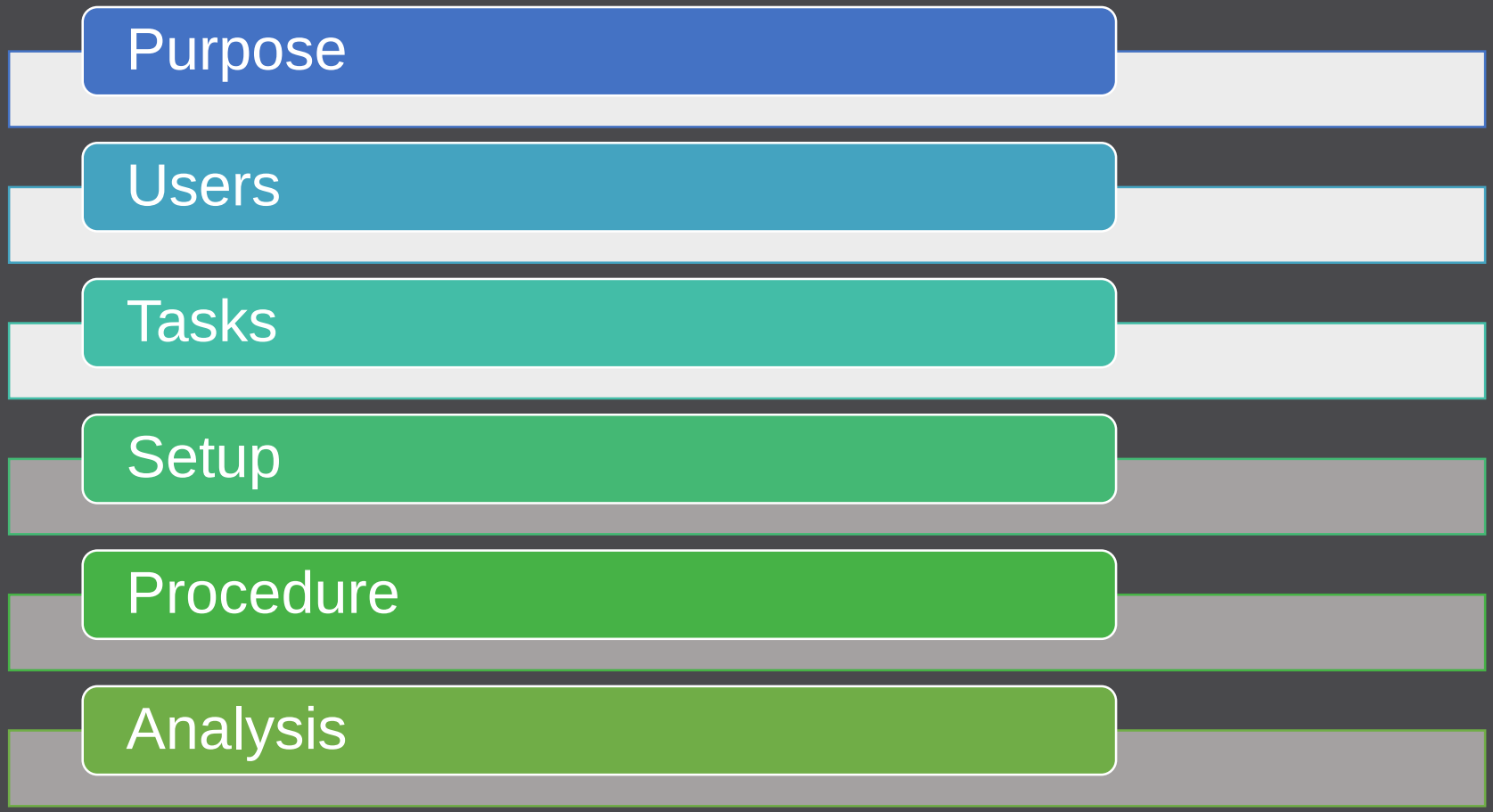


How to design SW user studies?

How to report on SW user studies?

- support the interpretation of the conducted user study
- enable the comparison to similar evaluations
- permit the replication of the user study

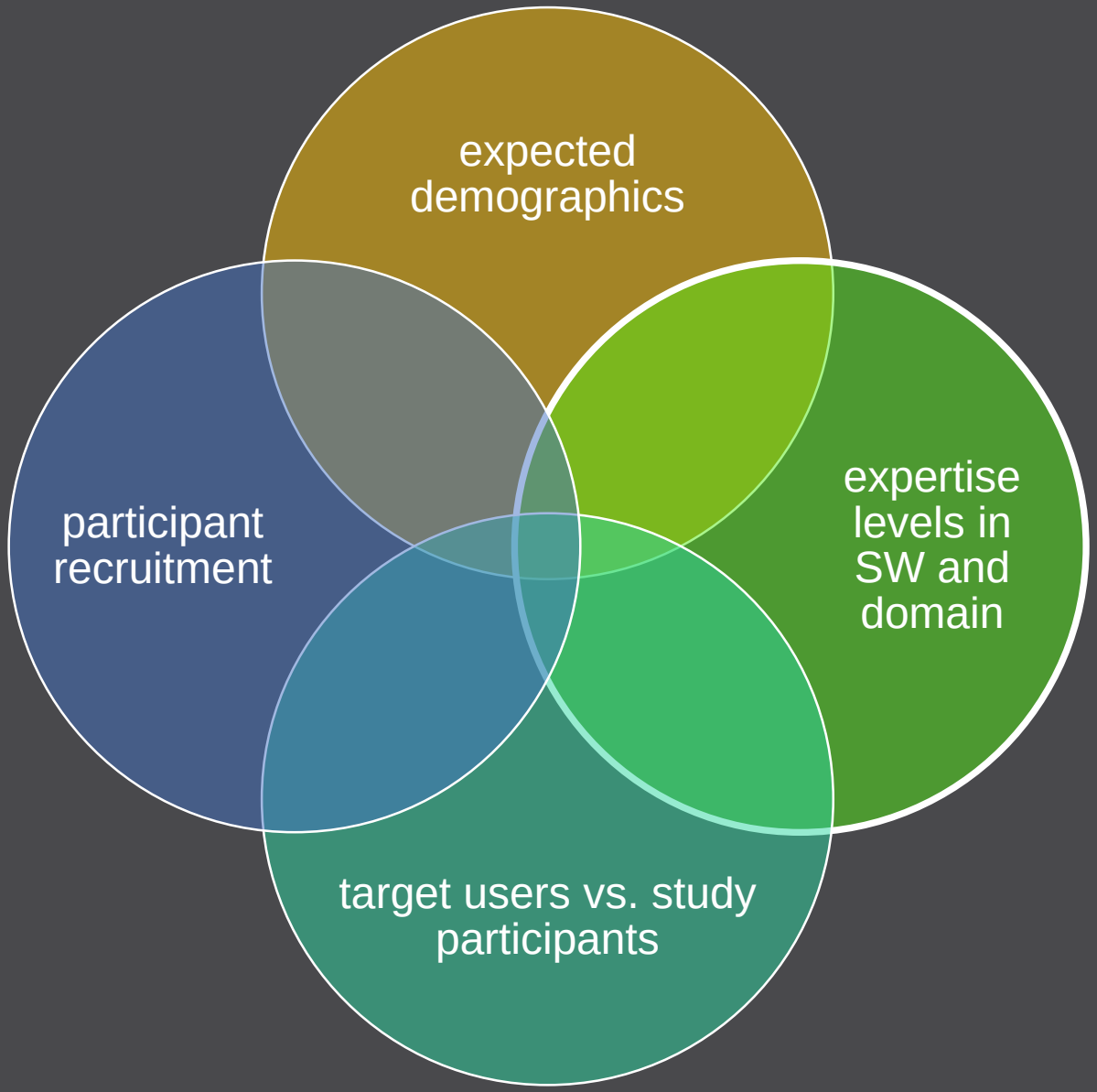
Minimum information about a user study in SW



Purpose

exploration	goal is general discovery and insight generation
search	focused examination of SW content with a clear information need
creation	includes operations such as modeling ontologies or RDF content, and creating mappings between SW resources
management	includes assessment, validation, annotation and editing of SW resources;

Users


expected demographics
participant recruitment
expertise levels in SW and domain
target users vs. study participants

Tasks

Include the **exact task descriptions**

For multi-purpose systems, **categorize tasks according to purpose**

Describe **data** and make it **available**

Final thoughts

- Nearly half of the papers did **not present a user study**
- Of the 46 papers with user study reports we reviewed, only **four** conducted studies for **SW experts and domain** experts, and **three** for **SW experts vs. novices**

- Are we struggling to find the right participants?
- Are we lacking space in our publications to devote to user testing results? Are these considered a *lesser* contribution?
- *Are SW researchers publishing their user studies elsewhere?*
- Or is there something else holding user testing and reporting in SW back?

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VOILA community

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