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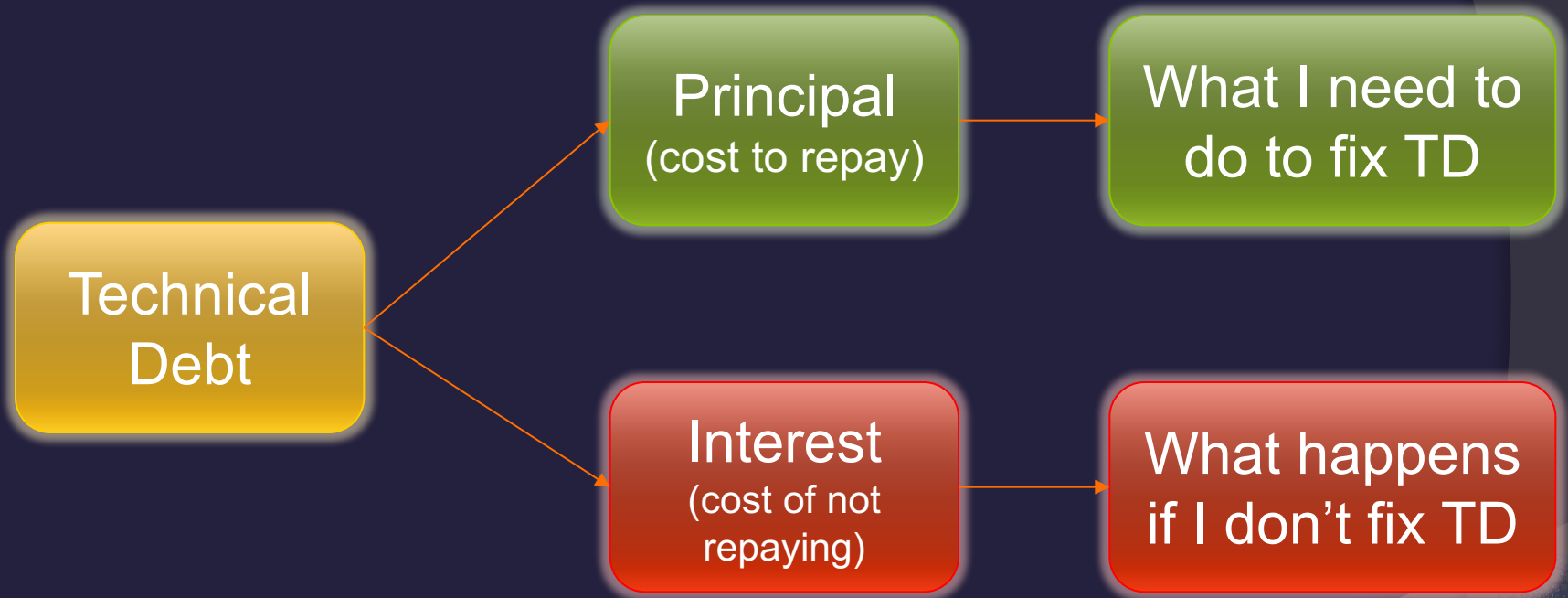
MTD 2017
Cologne, Germany
2017-05-22

Simon Vajda
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Mohammed Abdelrazek
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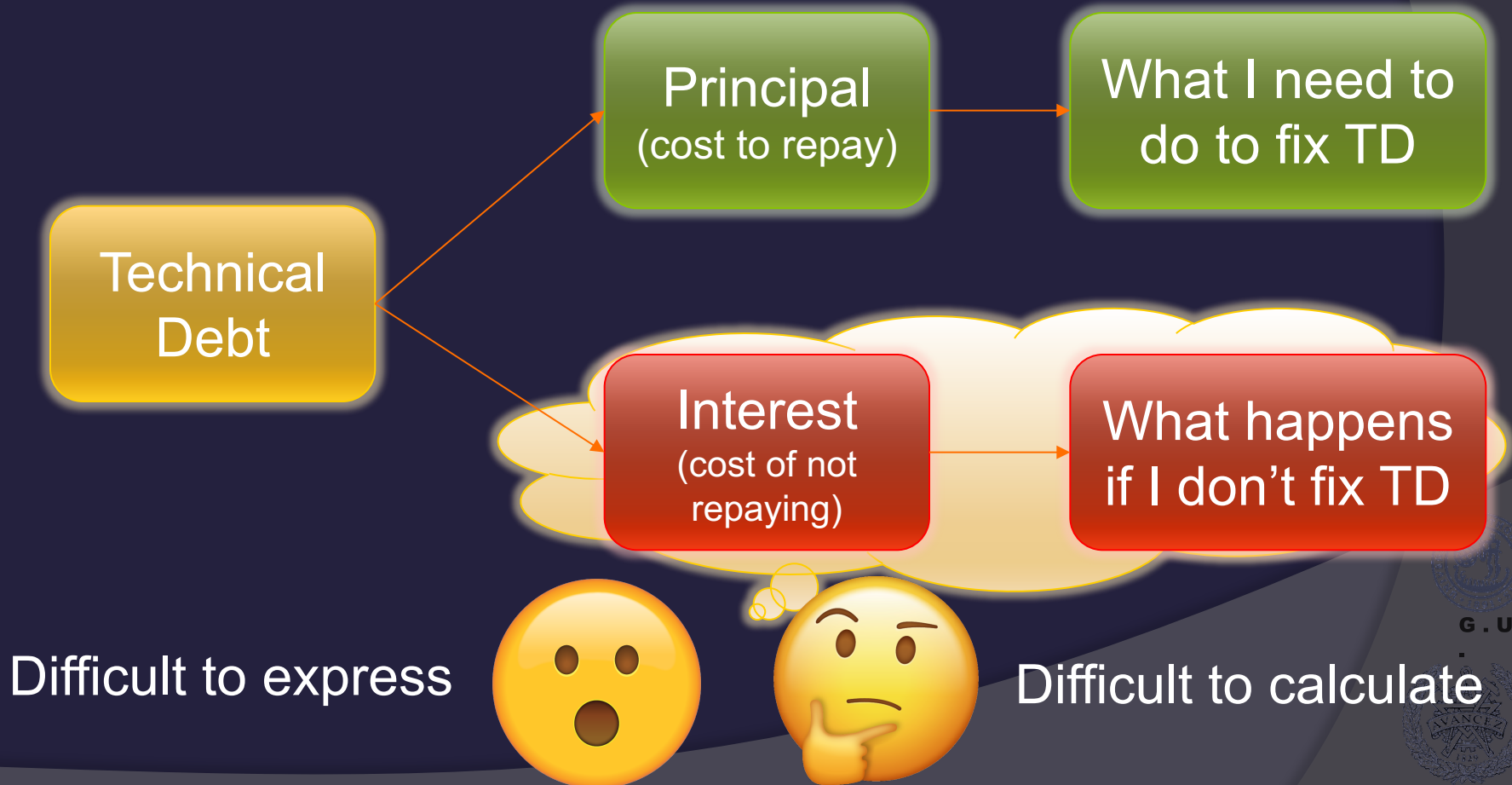
Deakin Software and
Technology Innovation Lab
Melbourne, Australia

TECHNICAL DEBT INTEREST ASSESSMENT: FROM ISSUES TO PROJECT

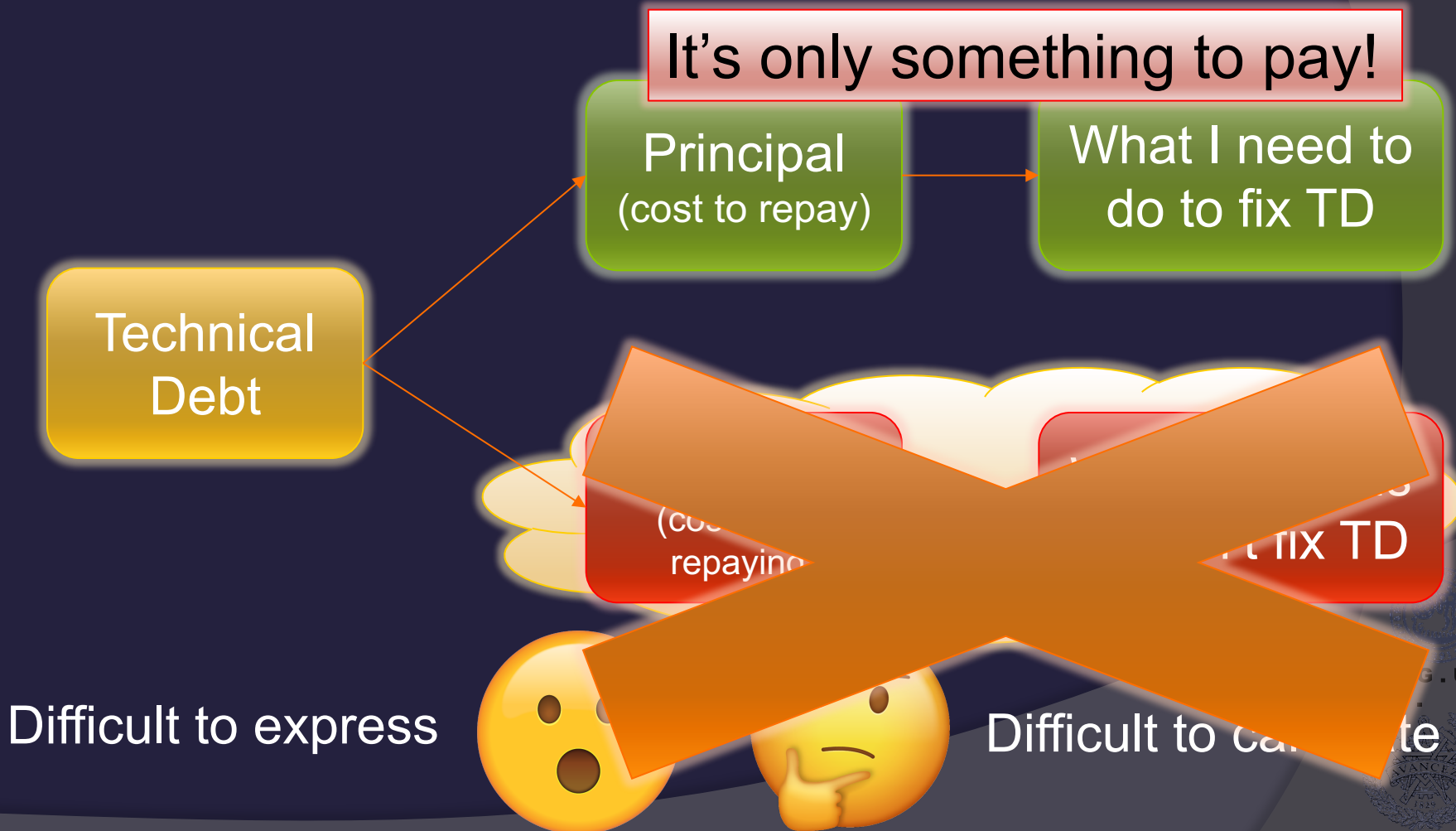
Recap: TD, principal, interest



Current challenges about the interest



Problem: what's the gain of repaying TD?



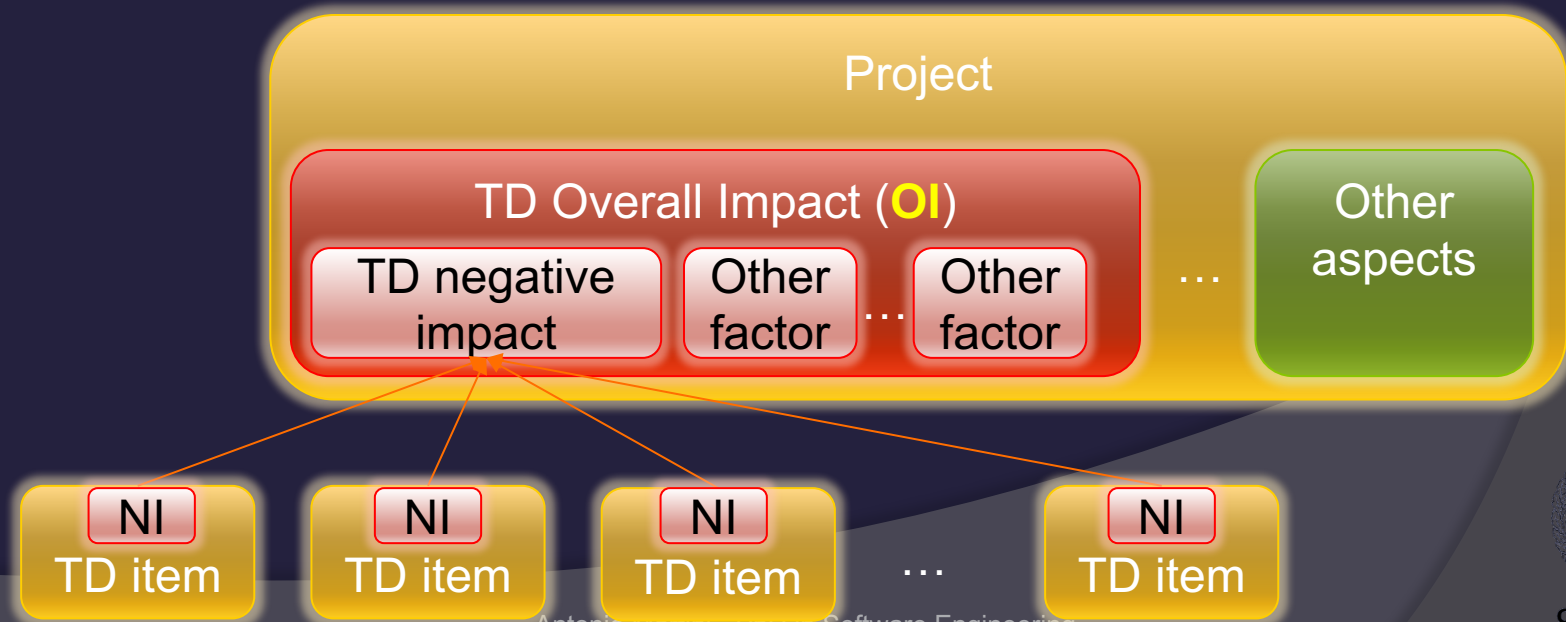
How to calculate interest?

- To track TD, teams usually use* **items**:
 - Backlog
 - Static analyzer tool
 - Generic documentation
- **None of these focus on calculating the interest!**
- Calculation: Probability*Severity
 - Probability
 - **Severity** = (negative impact)
 - We called it Negative Impact of TD

- Y. Guo *et al.*, “Tracking technical debt—An exploratory case study,” in *Software Maintenance (ICSM), 2011 27th IEEE International Conference on*, 2011, pp. 528–531.
- A. Martini, T. Besker, and J. Bosch, “The Introduction of Technical Debt Tracking in Large Companies,” in *accepted at APSEC 2016*, Hamilton, New Zealand, 2016.

Changing perspective on TD interest

- We usually consider TD interest for each item
- RQ How can we use this information to **assess** the impact of TD on a **project** level?
 - How can we **aggregate** from item to project?
 - What **other factors** besides the Negative Impact?



Case-study

- ◎ 4 projects
 - 3 small
 - 1 fairly big
- ◎ We collected
 - From the product owner and architect
 - High-level TD issues
 - OI (**Overall impact** on the project)
 - From the developers
 - List of TD issues with NI (**Negative Impact**)
 - (using AnaConDebt tool, see other presentation at MTD 2017)
 - OI assessment of the project
 - **Explanation** on how they derived the OI from NIs

Results (graphs)

WicketKeeper



avg of NI issues

0,1

diff between avg NI and
avg OI

0,5

diff between OI

Virgil

4,475

avg of NI issues

1,475

diff between avg NI and
avg OI

0

diff between OI

Agreement between PO and Developers

Czar

7,1

avg of NI issues

3,6

diff between avg NI and
avg OI

1

diff between OI

Serenity

5,47

avg of NI issues

0,47

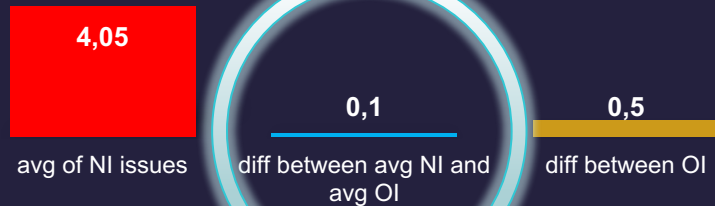
diff between avg NI and
avg OI

2

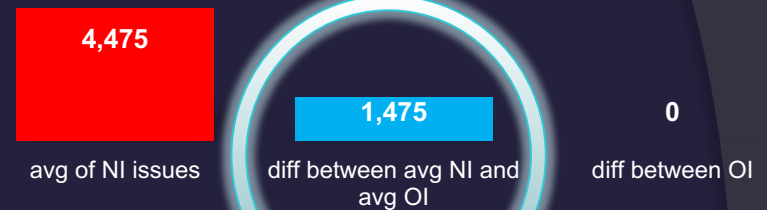
diff between OI

Results (graphs)

WicketKeeper

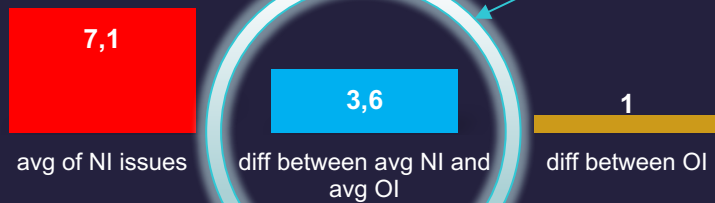


Virgil

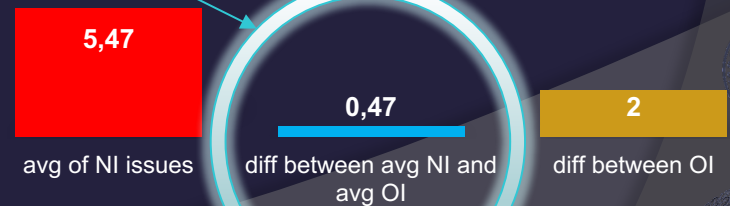


Is the OI an average of the items' NIs?

Czar

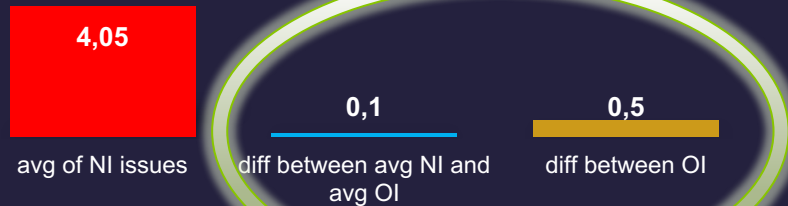


Serenity



Results (graphs)

WicketKeeper

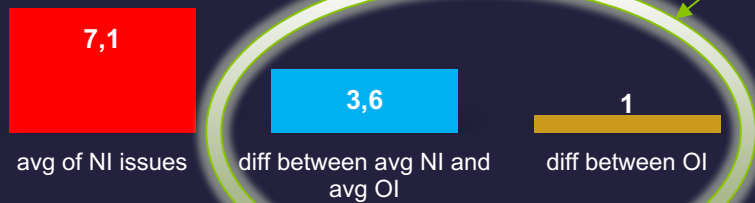


Virgil

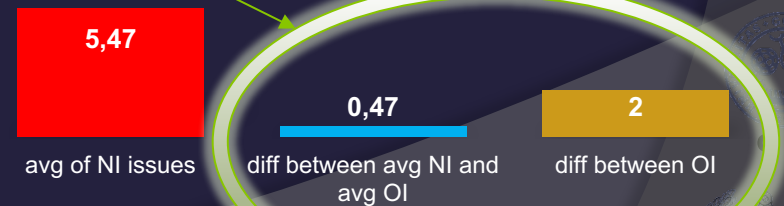


Is the difference of OI similar to the difference of avg NIs?

Czar



Serenity



Results (summary)

- OI is related to NIs
 - OI is **not calculated as a sum** of NIs of TD items
 - The aggregation seems closer to an **average**
- There are **other factors** contributing to the OI that are not included in the NIs
- For **large projects**, developers had **difficulties** to assess the **OI**
 - Also, the difference between devs and PO is larger
- **Aggregating** NI to OI is an **iterative** process
 - Between devs and PMs
 - A common basis (the tool) helps alignment

How to map from NIs to OI?

- ⦿ Qualitative answers from developers and product owner
- ⦿ How is the **Overall Impact** calculated?
 - Factors taken in consideration as most important
 - Negative Impact of TD items (NI)
 - Portion of the code affected
 - Project size and complexity
 - Roadmap of features blocked by TD
 - Secondary factors
 - Positive impact of TD
 - Existing alternatives to current TD
 - Cultural attitude of the team towards TD
 - E.g. willing to refactor TD

Future work

- ⦿ More cases
- ⦿ Further investigation and evaluation of factors
- ⦿ Development of a method/tool to support in estimating OI of a project given the NI
- ⦿ Comparison across projects



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Discussion

