Taxing Collaborative Software Engineering

Michael Dorner

Agenda

- What is the problem?

- Why is the problem a software engineering problem?

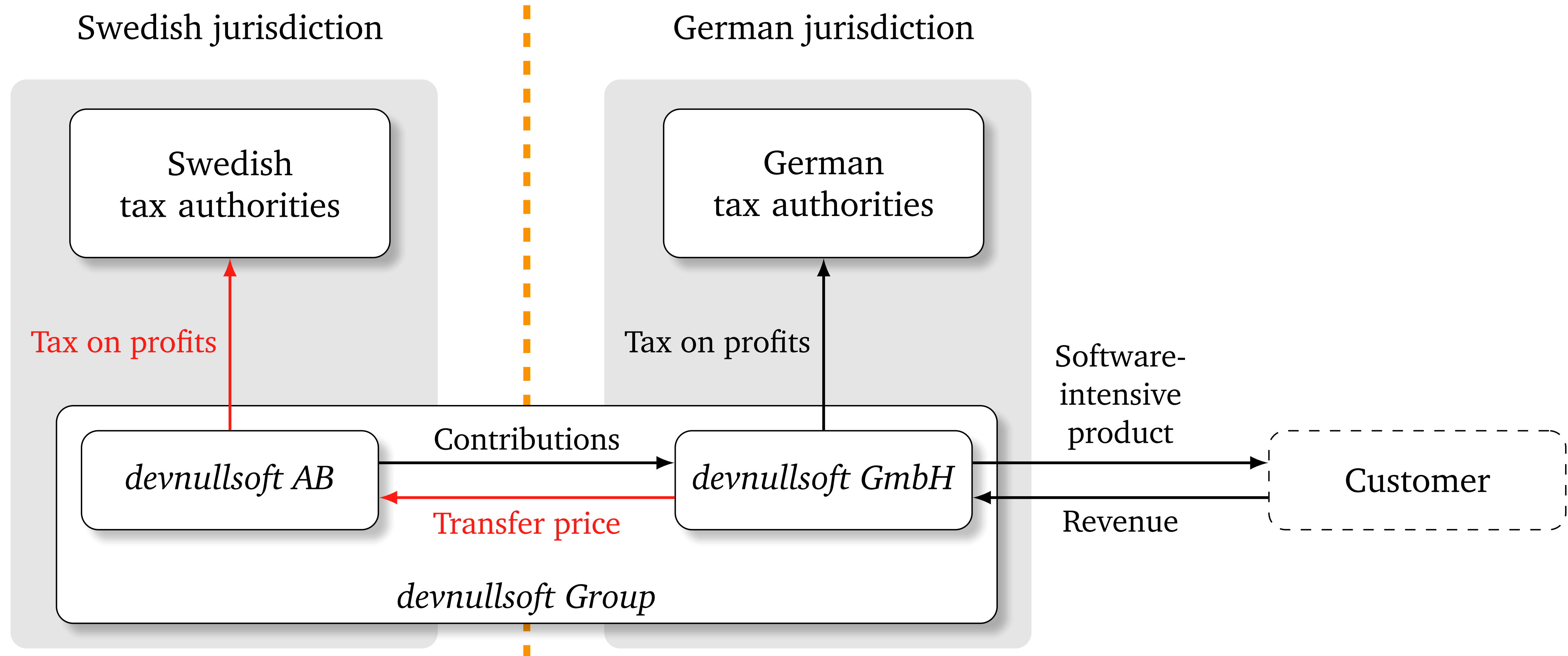- Is the problem a problem?

What is the problem?

Arm's length principle

"Associated enterprises [must] operate as if not associated and regular participants in the market."

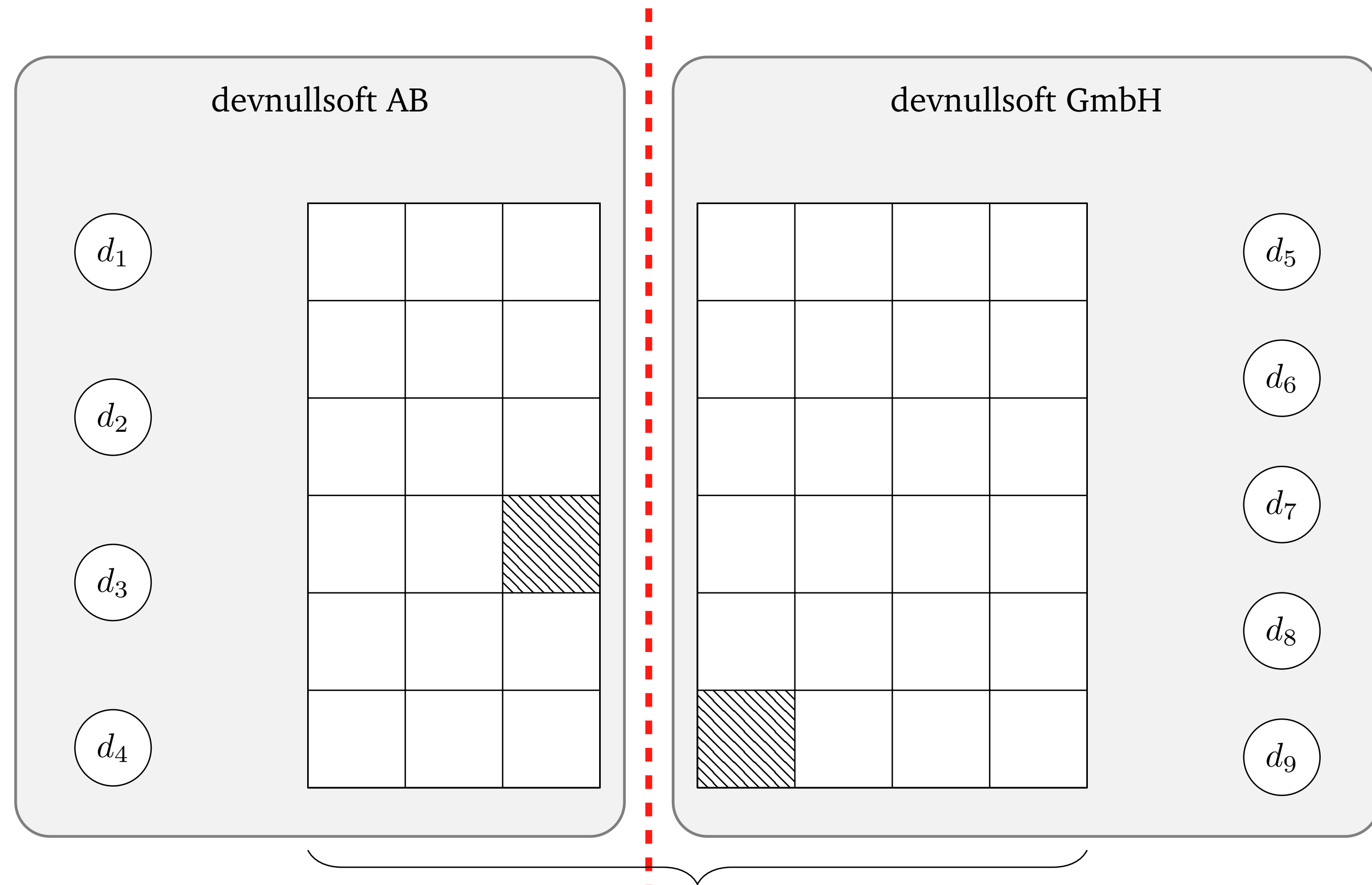*–OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*

Swedish jurisdiction

German jurisdiction

Swedish
tax authorities

German
tax authorities

Tax on profits

Tax on profits

Software-
intensive
product

Contributions

devnullsoft AB

devnullsoft GmbH

Customer

Transfer price

Revenue

devnullsoft Group

Why is the problem a software engineering problem?

devnullsoft AB

devnullsoft GmbH

d_1 d_2 d_3 d_4

d_5 d_6 d_7 d_8 d_9

Software system

○ Developer
☐ Software component
▨ Reused software component
→ Taxable transaction
→ Non-taxable transaction

devnullsoft AB

devnullsoft GmbH

d_1
d_2
d_3
d_4

d_5
d_6
d_7
d_8
d_9

Software system
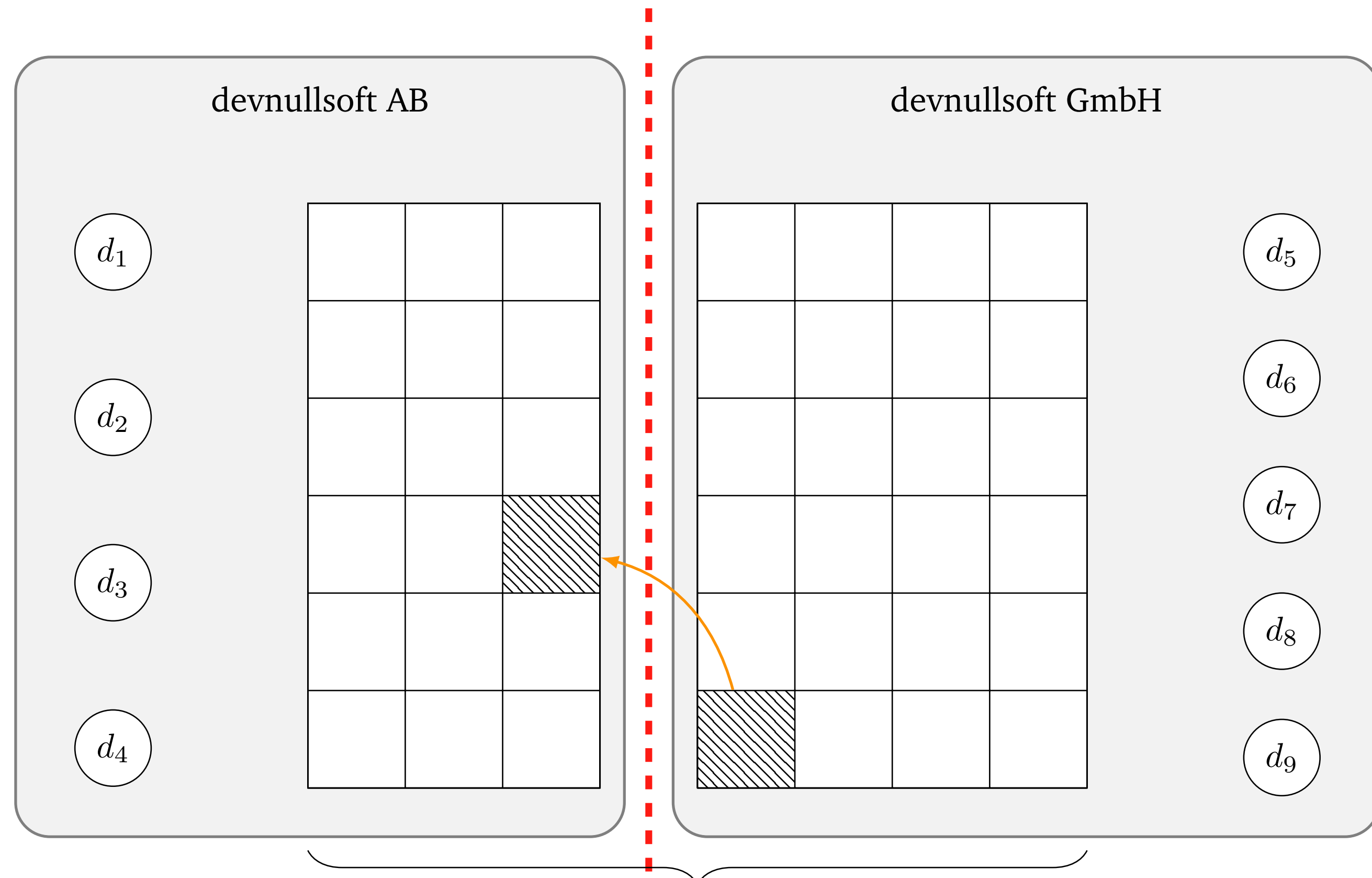
Developer

Software component

Reused software component

Taxable transaction

Non-taxable transaction

⬜		Developer
☐		Software component
▨		Reused software component
→(orange)		Taxable transaction
→(blue)		Non-taxable transaction

devnullsoft AB

devnullsoft GmbH

Software system

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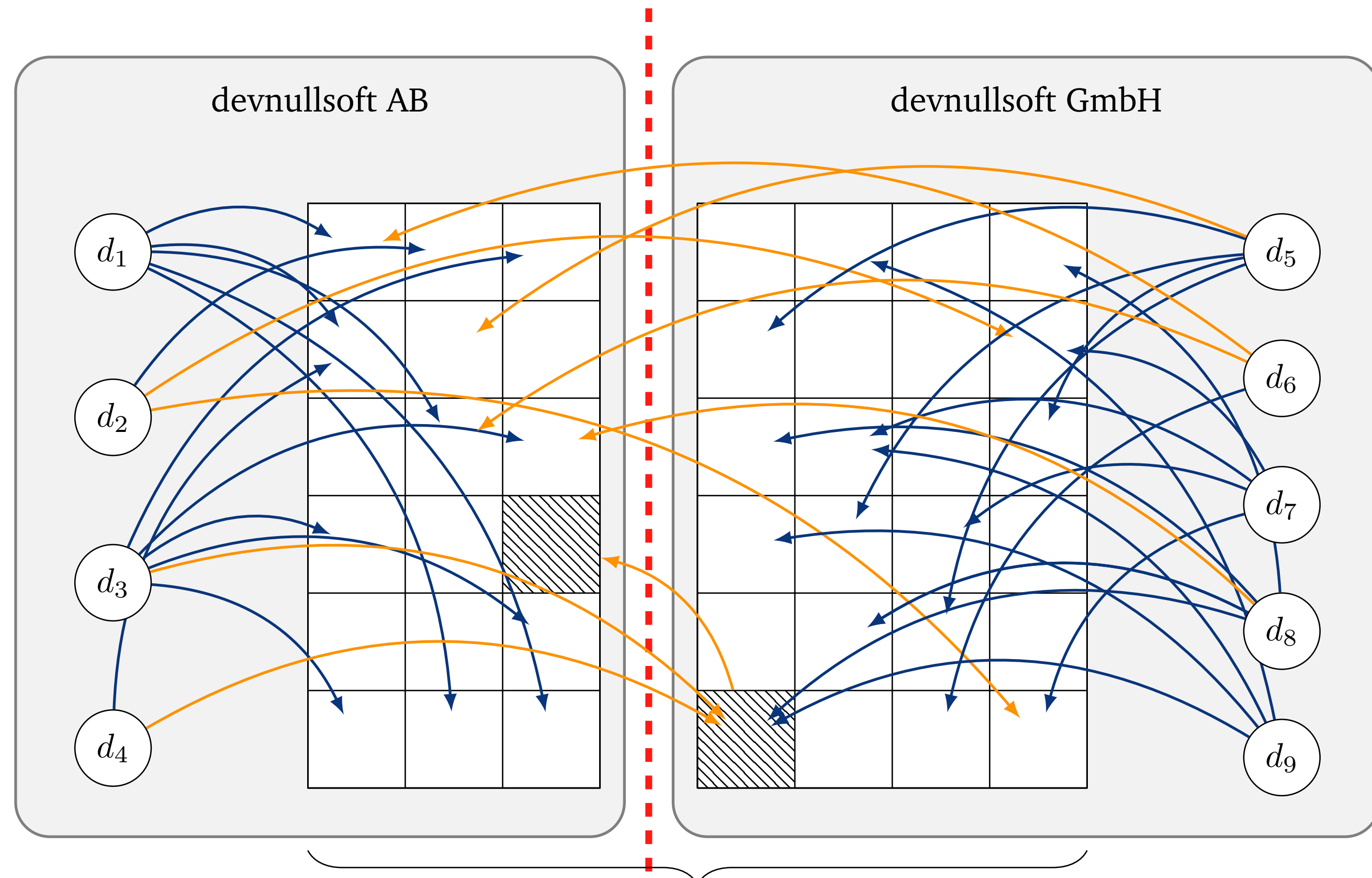
① What is a taxable transaction in software engineering?

② How to track taxable transactions?
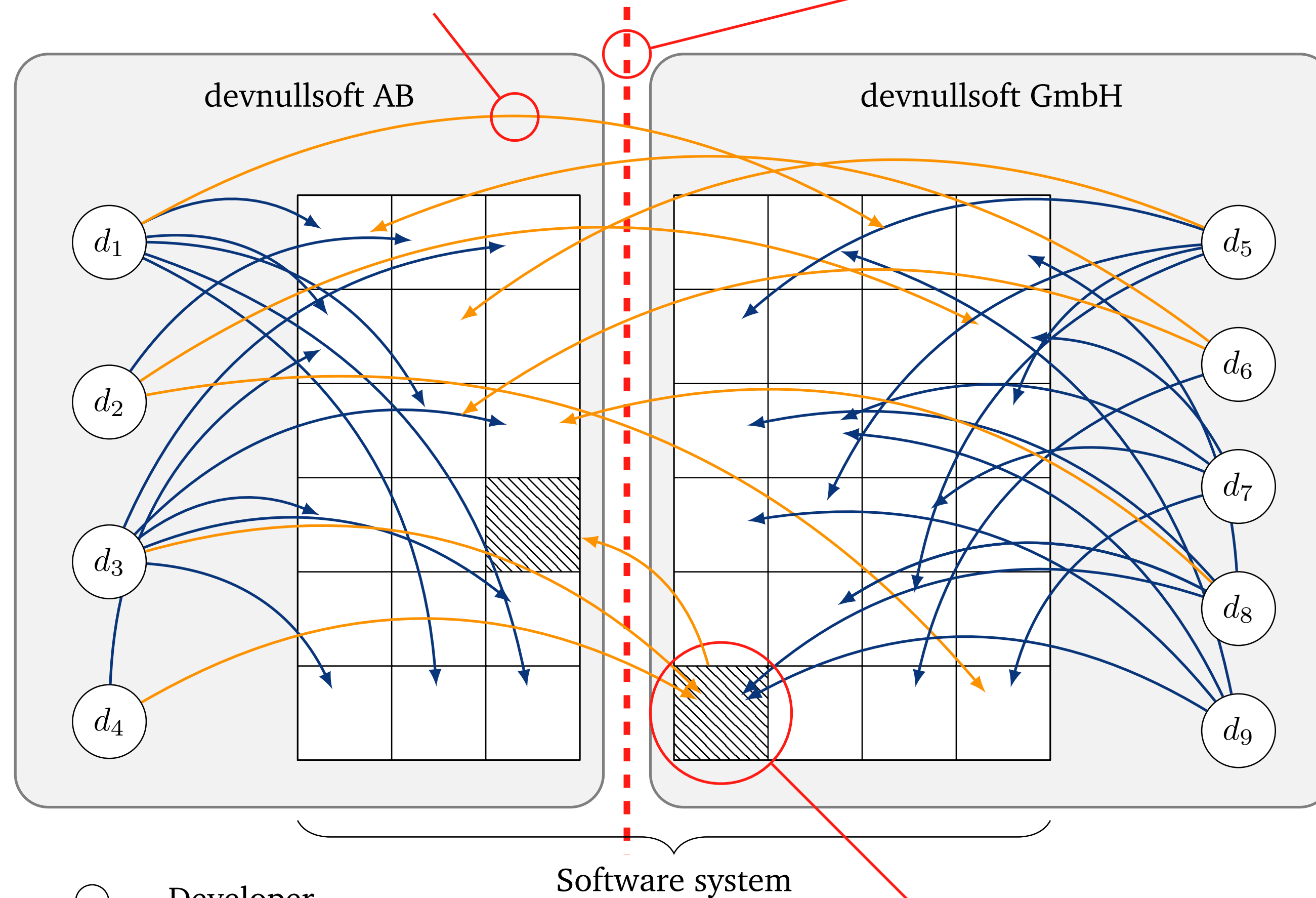
③ How to value taxable transactions?

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d_1 d_2 d_3 d_4 d_5 d_6 d_7 d_8 d_9

Software system

○ Developer
□ Software component
▨ Reused software component
→ Taxable transaction
→ Non-taxable transaction

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Challenges

- **Challenge 1:** Identifying the taxable transactions requires either a holistic perspective of software engineering or at least suitable, practical, and accurate proxies. Compliant software engineering needs a common understanding and a taxonomy of taxable transactions specific to software engineering.

- **Challenge 2:** Data for tracking taxable transactions may be incomplete, faulty with respect to location, or restricted. There is no dedicated tool support yet for the practical transfer price determination.

- **Challenge 3:** A purely quantitative valuing can hardly reflect the value of transactions; however, a purely qualitative assessment does not scale with the magnitude of cross-border transactions in modern software development.

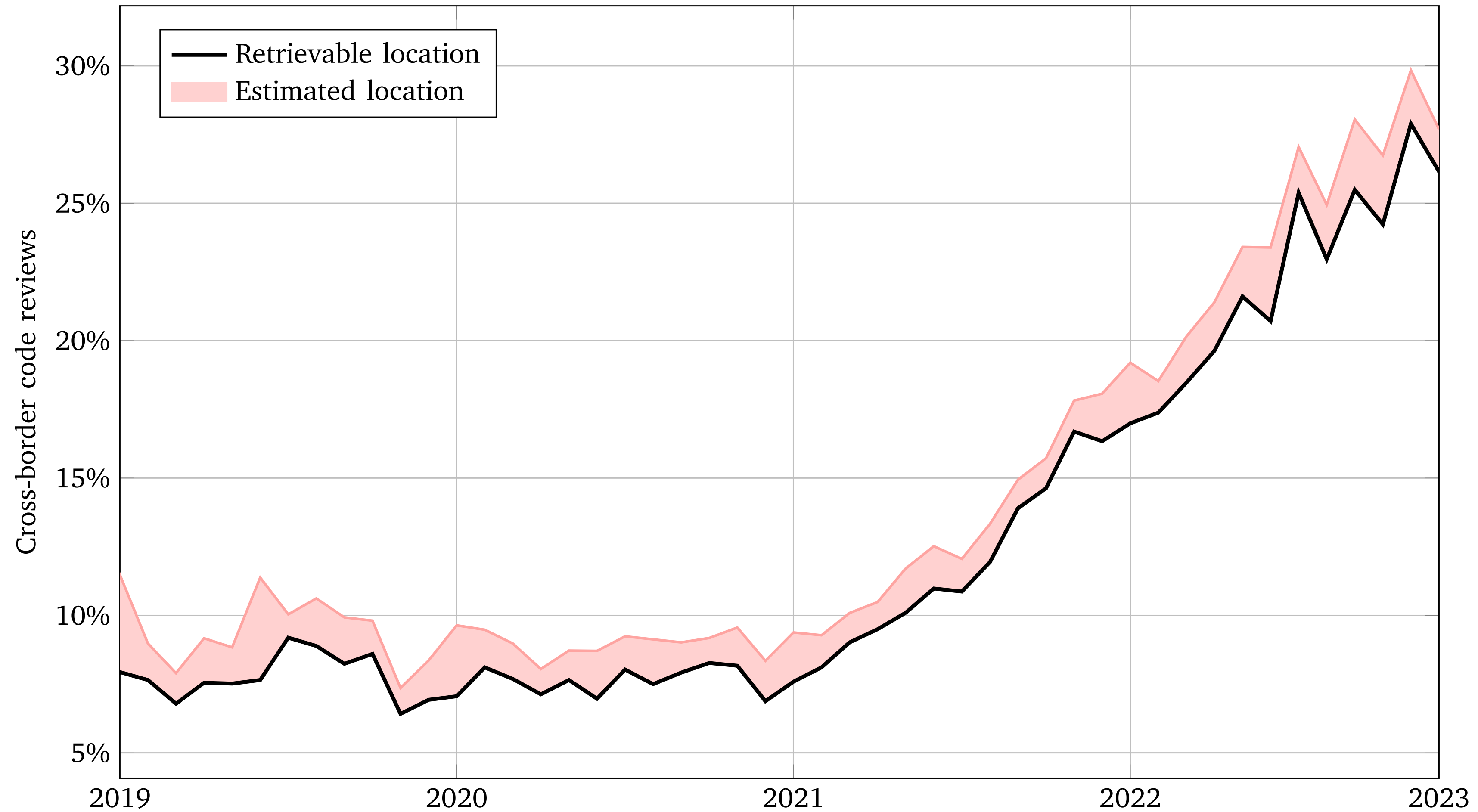# Is the problem a problem?

Yes.

FIGURE 3. The share of cross-border code review at our case company in the years 2019, 2020, 2021 and 2022 (black line) monthly sampled. Since not all historical locations of all code review participants could be reliably retrieved, the share of cross-border reviews could be more significant (indicated by the red area).

Not at your multinational enterprise?

- Check it out for your company!

- Replication package available:

  https://github.com/michaeldorner/tax_se
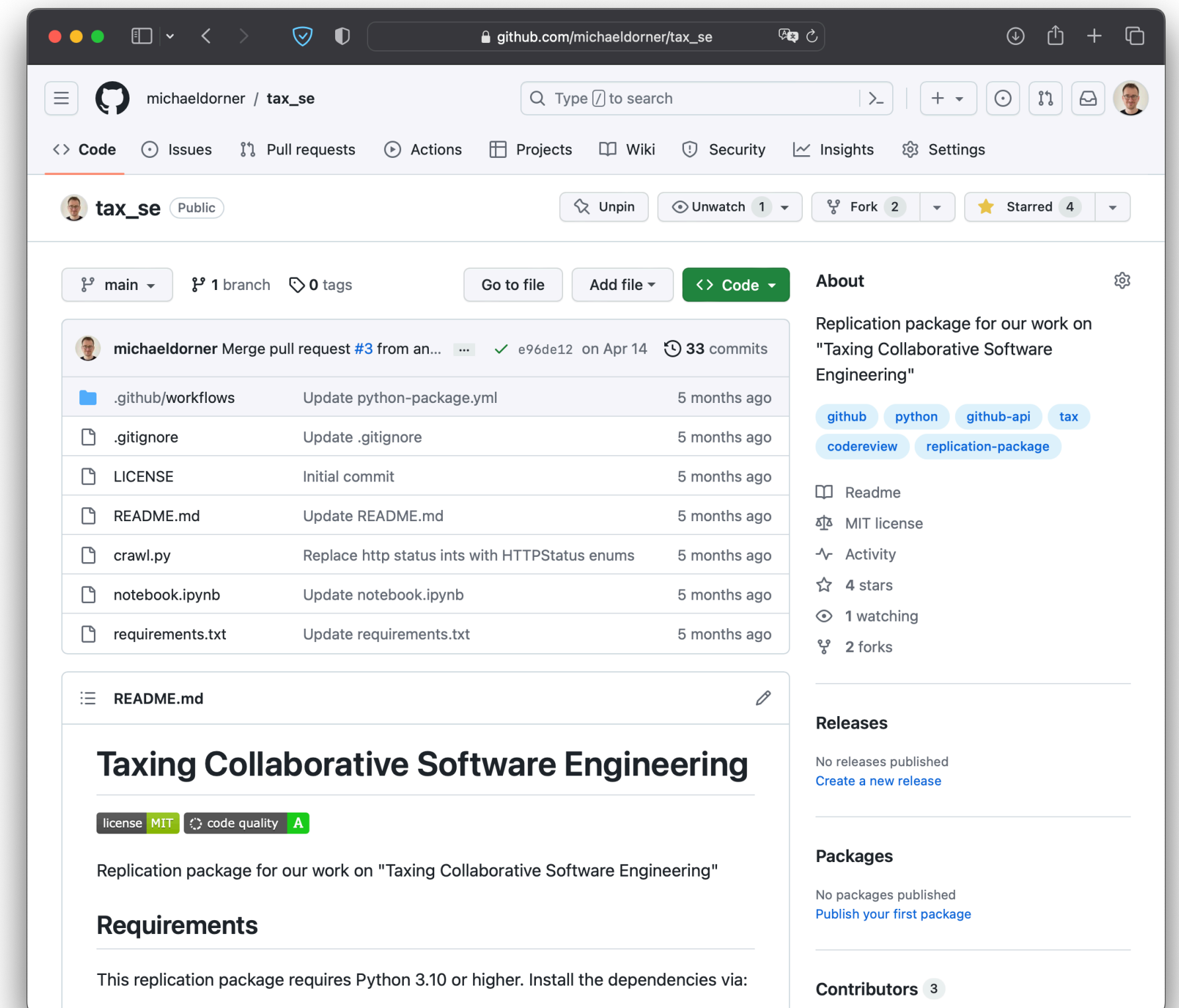
Summary

What we learnt today

- Collaborative software engineering across borders within a company is taxable

- Compliance with international taxation standards is an unsolved problem for modern software engineering with its fine-grained and complex collaboration

- A solution requires from the software engineering community a common understanding, a practical tracking, and an adequate valuing of taxable transactions in the context of collaborative software engineering

Interested? Excited? Scared?

- Have a look into our preprint: https://arxiv.org/abs/2304.06539

- Ask **Michael Dorner***, Maximilian Capraro, Oliver Treidler, Tom-Eric Kunz, **Darja Šmite***, **Ehsan Zabardast***, Daniel Mendez, Krzysztof Wnuk

* today around

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"He's spending a year dead for tax reasons."

–Douglas Adams, *The Hitchhiker's Guide to the Galaxy*