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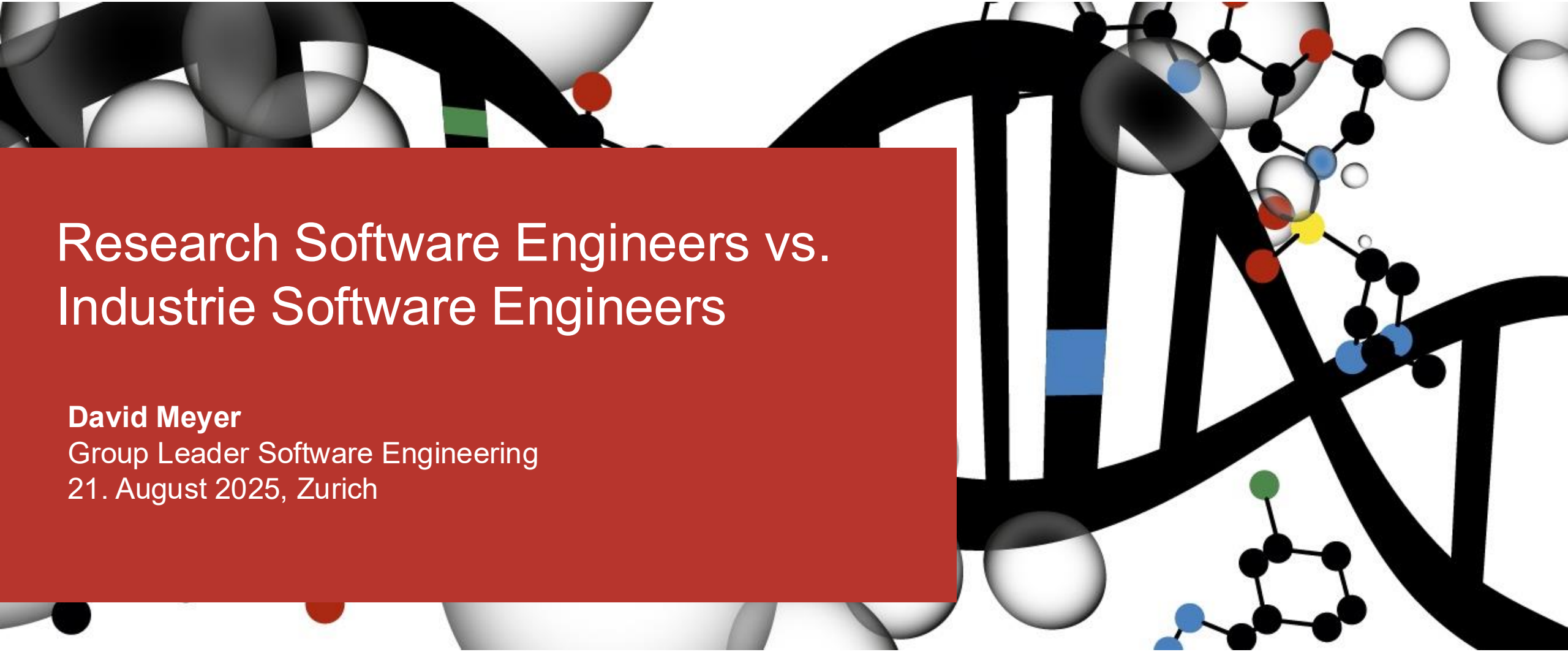
nexus Personalized Health



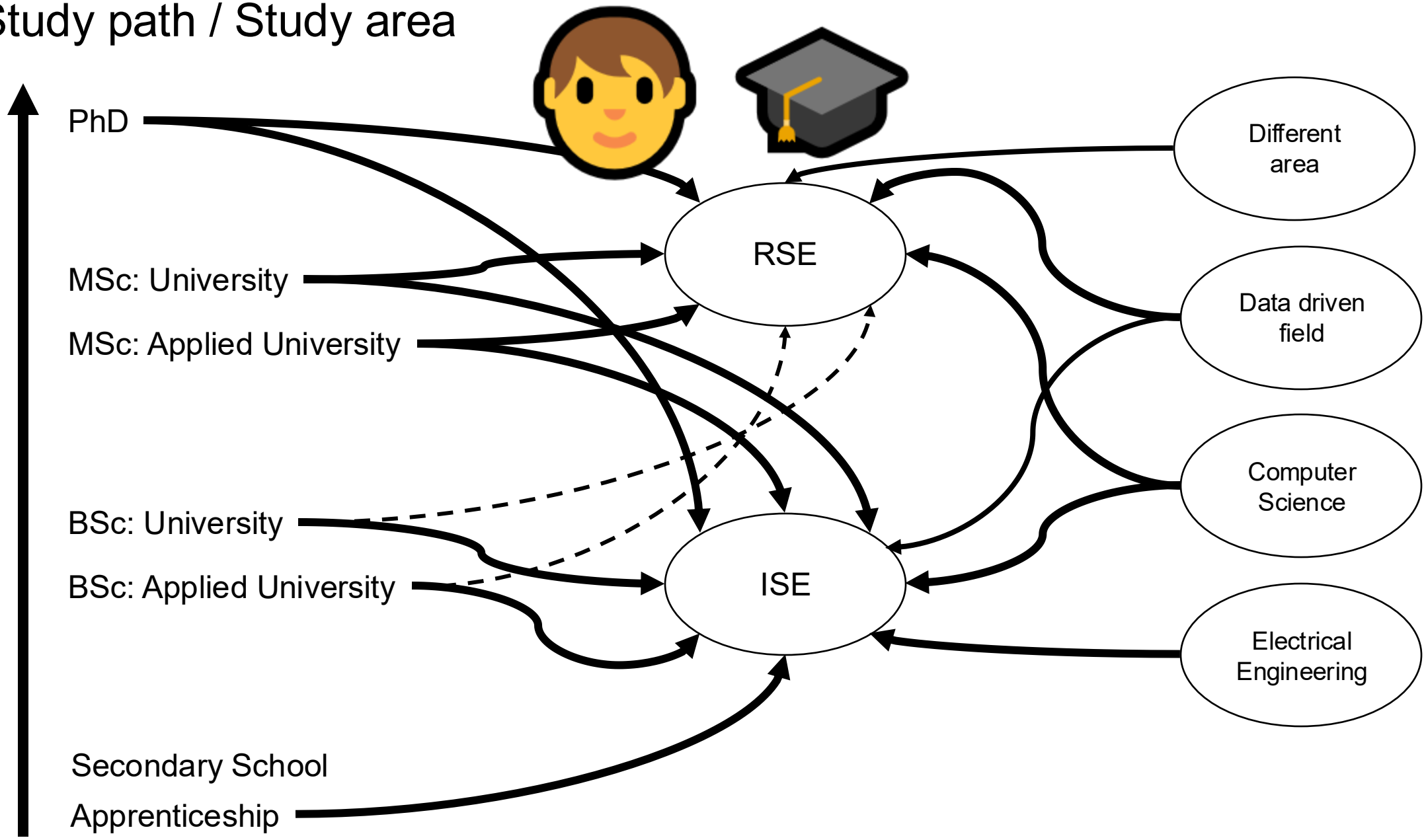
Research Software Engineers vs. Industrie Software Engineers

David Meyer
Group Leader Software Engineering
21. August 2025, Zurich

Agenda

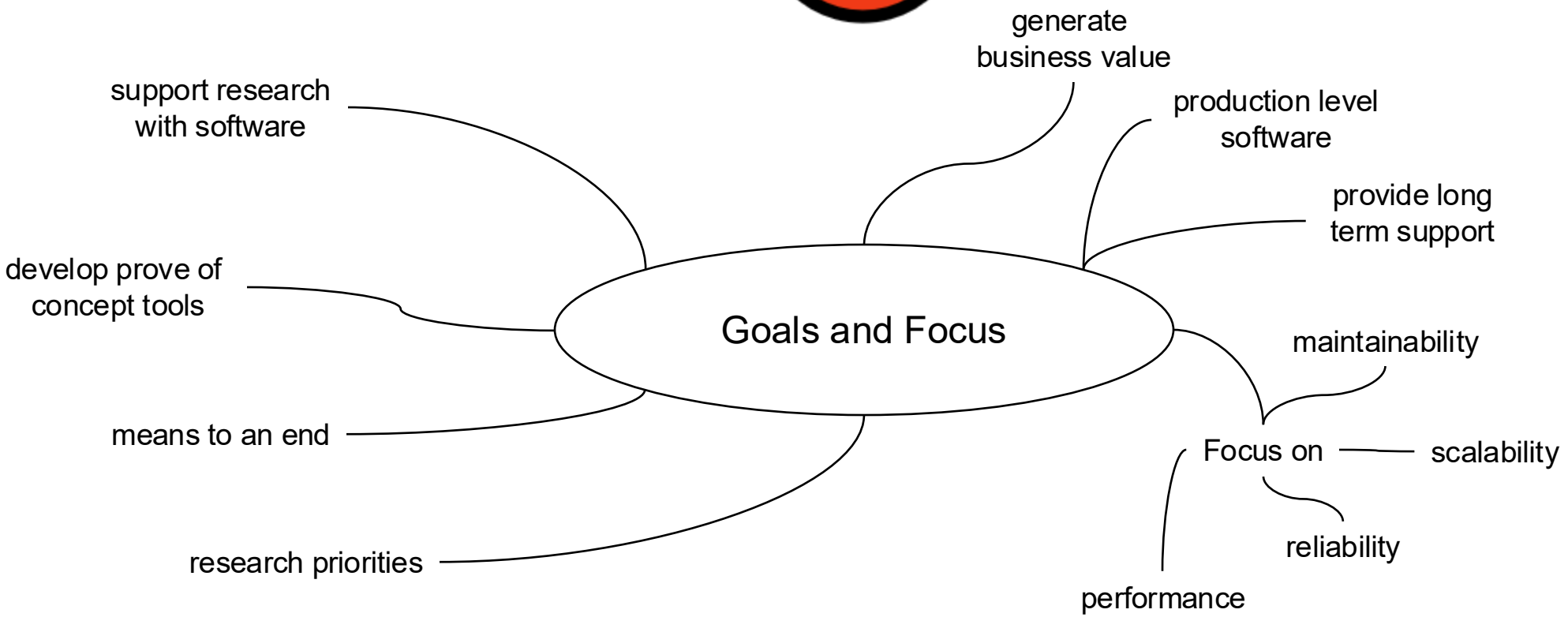
- Overview of the differences
- Combine the best of both worlds
- What’s your thoughts?

Study path / Study area



RSE

ISE


generate
business value
support research
with software
production level
software
provide long
term support
develop prove of
concept tools
Goals and Focus
maintainability
means to an end
Focus on
scalability
reliability
research priorities
performance

RSE

ISE

Practices

more flexibility
- programming language
- framework
- tools
- no specification

experimentation / exploratory

speed over quality

less flexibility
- well-specified requirements
- strict development standards
  - code review
  - CI/CD
  - unit tests
  - documentation

business case oriented

quality over speed
- well defined
- robustness
- scalability
- security
- maintainability

RSE

ISE

Mode of work

researchy

"understands" researchers

know research principles

experimentation / exploratory

chaotic

different PMs

greenfield approach

structureless

applied

Stick to few programming languages and frameworks

product driven

clear specification

user story

issue by issue

adhere to development processes

one-person-show

responsible for everything

full-stack

team effort

PM

UX designer

DB specialist

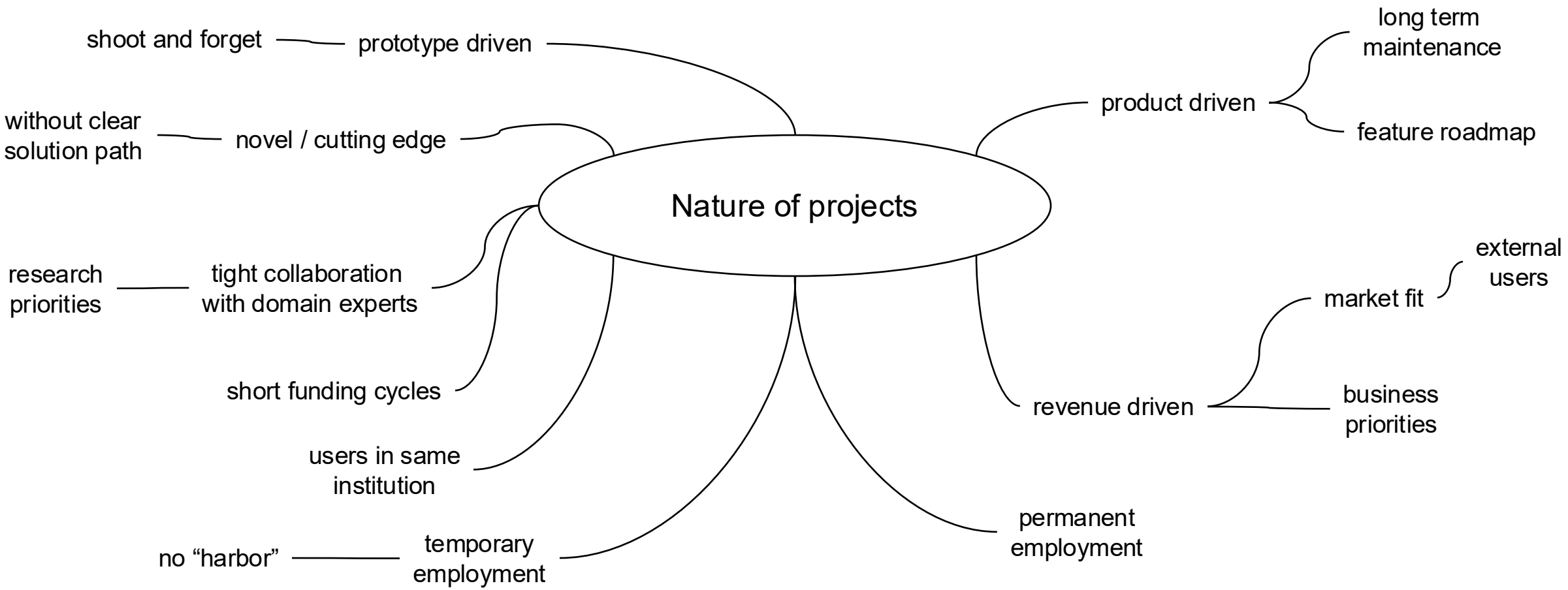
backend

frontend

RSE takes over different roles
ISE can be very specialized

RSE

ISE


Nature of projects
shoot and forget
prototype driven
without clear solution path
novel / cutting edge
research priorities
tight collaboration with domain experts
short funding cycles
users in same institution
no “harbor”
temporary employment
permanent employment
product driven
long term maintenance
feature roadmap
revenue driven
market fit
external users
business priorities

RSE

ISE

researchers

professors

PhDs

technical research stuff

Collaboration and Stakeholders

product managers

designers

QA engineers

marketing team

customer support

research requirements

budget and timeline

need to understand

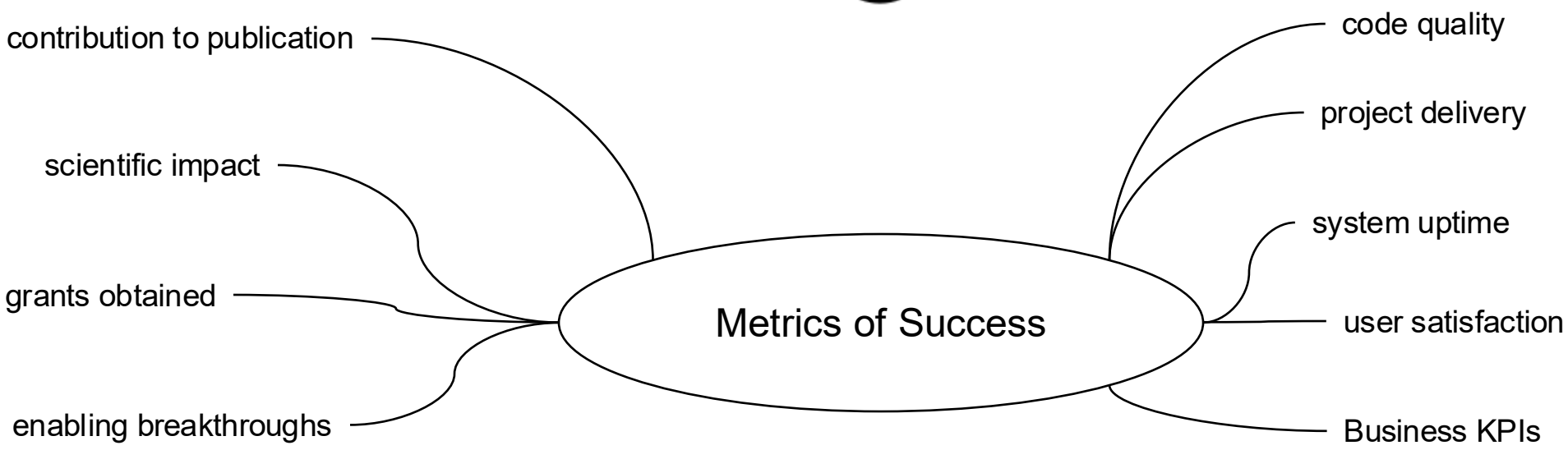
need to understand

user stories

business requirements

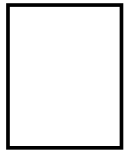
RSE

ISE

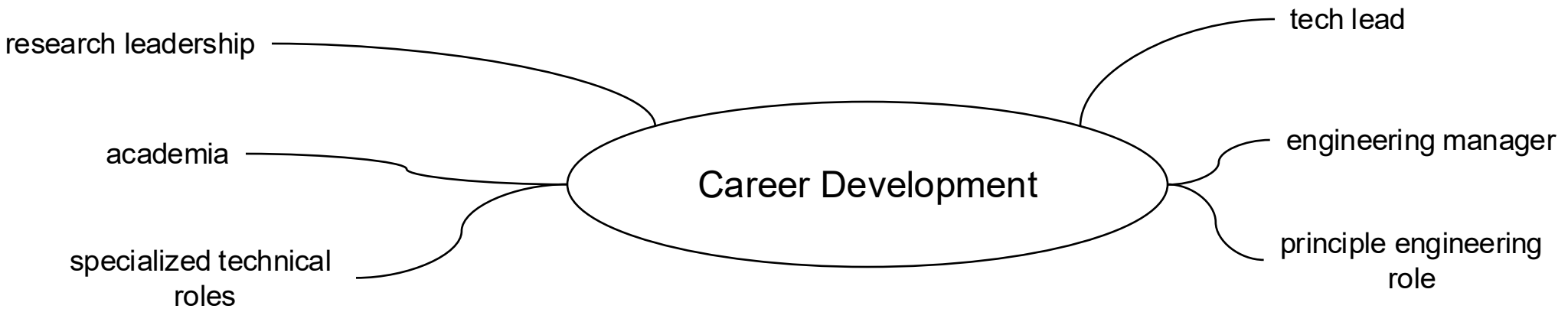


RSE is personally more exposed
ISE works “hidden” behind a company

RSE

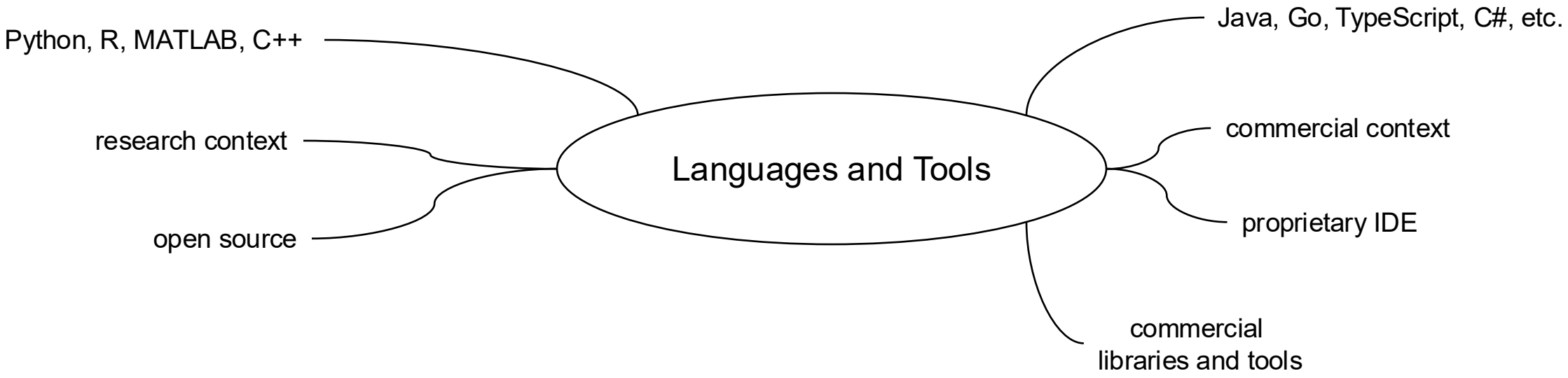


ISE


research leadership
academia
specialized technical roles
Career Development
tech lead
engineering manager
principle engineering role

RSE

ISE


Python, R, MATLAB, C++
research context
open source
Languages and Tools
Java, Go, TypeScript, C#, etc.
commercial context
proprietary IDE
commercial
libraries and tools

Summary

Aspect	Research Software Engineer	Industry Software Engineer
🎯 Goal	Support research	Deliver commercial products
🛠️ Code quality focus	Flexible, exploratory	High, standardized
💼 Project type	Experimental, short-term	Product-driven, long-term
🤝 Stakeholders	Researchers	Product teams, customers
🌡️ Success metrics	Publications, scientific impact	Business impact, user metrics
🧰 Languages/tools	Python, R, MATLAB, C++ (research context)	Java, Go, TypeScript, C#, etc.
🖥️ End user	Researchers, academics	Customers, general users

Main differences: purpose and audience

What about translational projects?

RSE ISE

prototype → **production solution**

Transfer

Collaboration

Combine the best of both worlds

Technology platform (cost centre organisation)
- "harbor"
- exchange w/ like-skilled
- provide SE as a service

provide support

build teams

establish standards
- substitution possible
- better quality
- enable reusability
- more structure
- improve maintainability

enhance individual freedom
- allow prototyping
- split into loosely coupled parts
- don't apply overstructured development procedures

Research facility (cost centre organisation)
- provide "RSE" prototypes as a service

Translational Applications

Persistent software product

What’s your thoughts?

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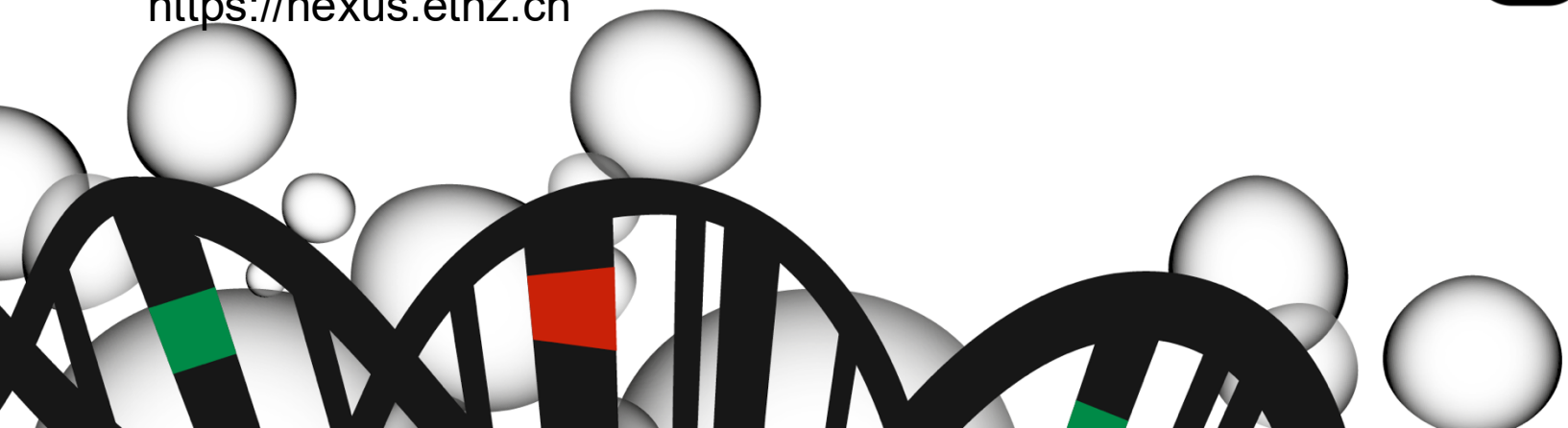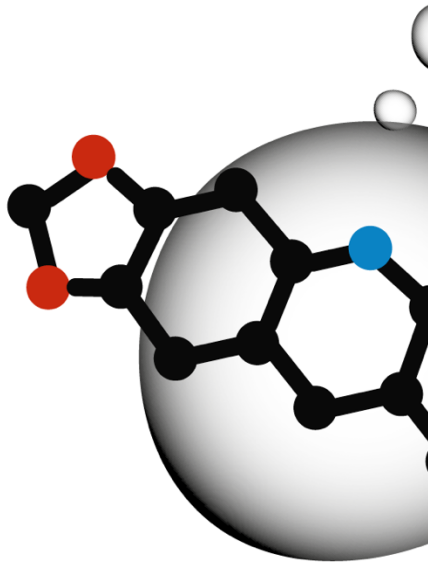
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