Industry and Academia: Why Practioners and Researchers are Disconnected.

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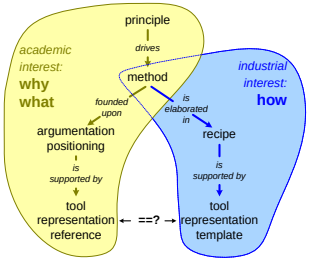
Abstract

The industrial world and the academic world have grown far apart. The distance between the worlds primarily originates from different goals and different means of support. This is a problem in the areas of systems engineering and multi-disciplinary design. These areas are relatively young, providing lots of opportunity for research. Education in this area is scarce. Publications are tangible examples of the gap between the two worlds.
In this paper we discuss the needs of both communities with respect to publications, education, and research. The mutual understanding of each other's needs may help to bridge the gap between academics and industry.



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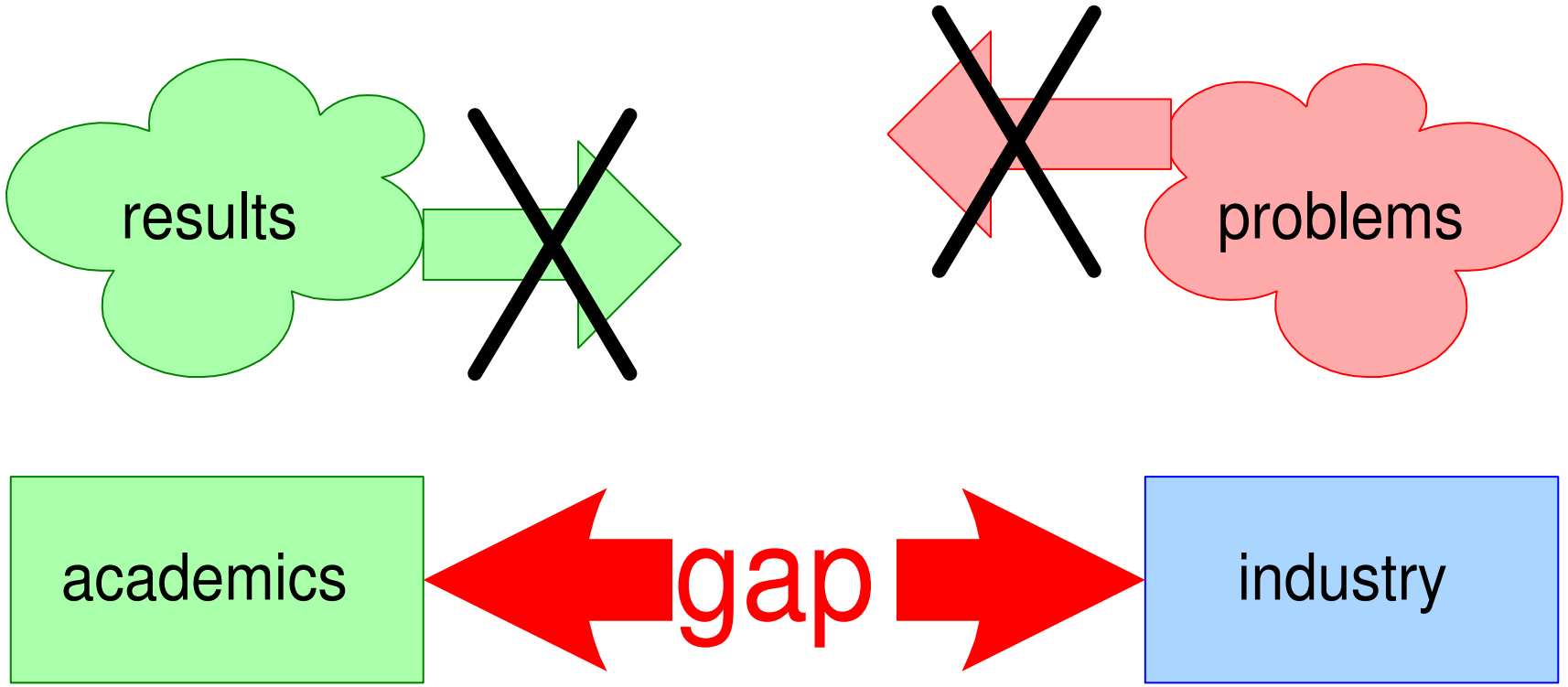
Practitioners and Researchers are Disconnected



reflection

evidence

exposure

education

time pressure

pragmatics

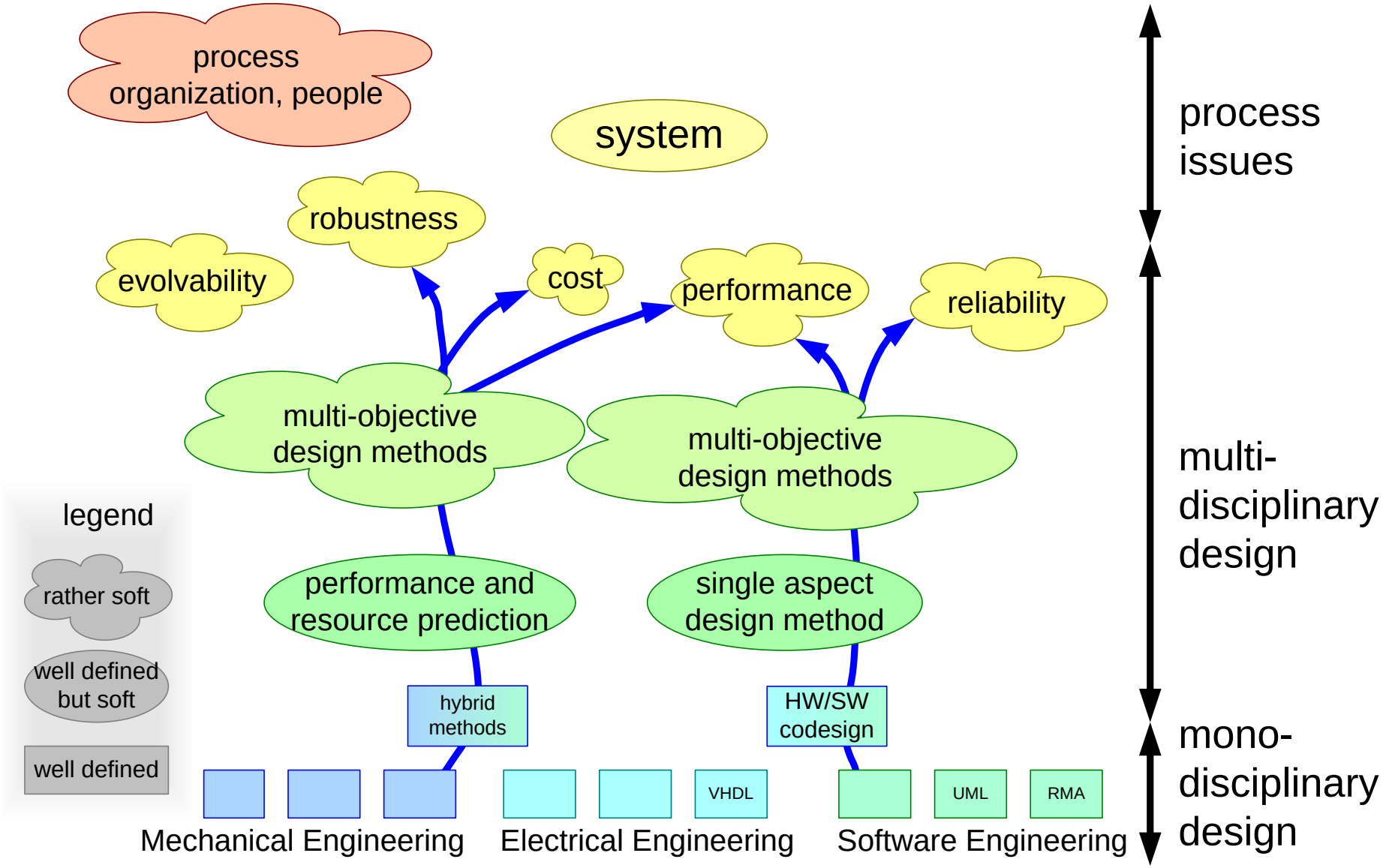
cost constraints

products

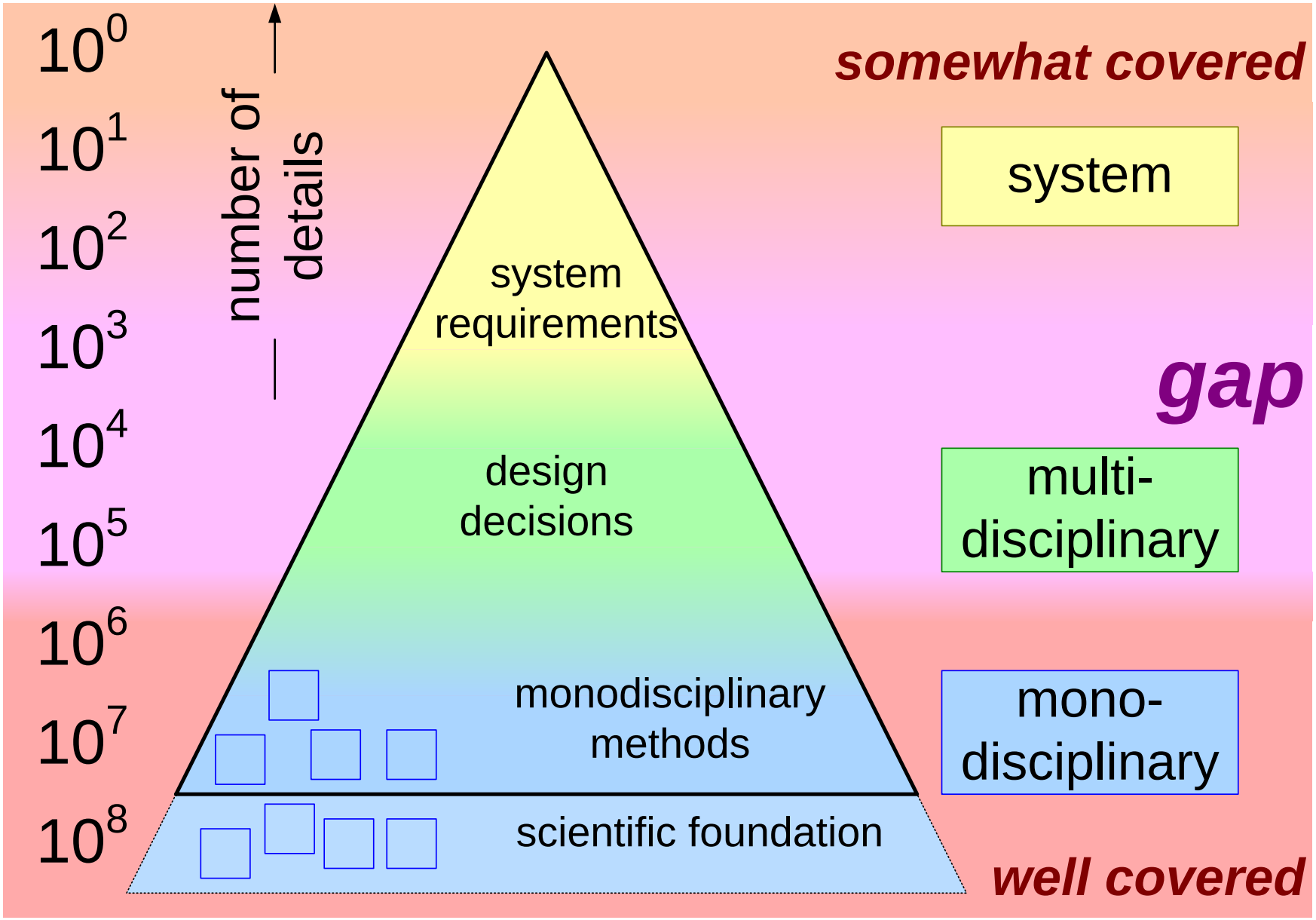
sales

lots of people

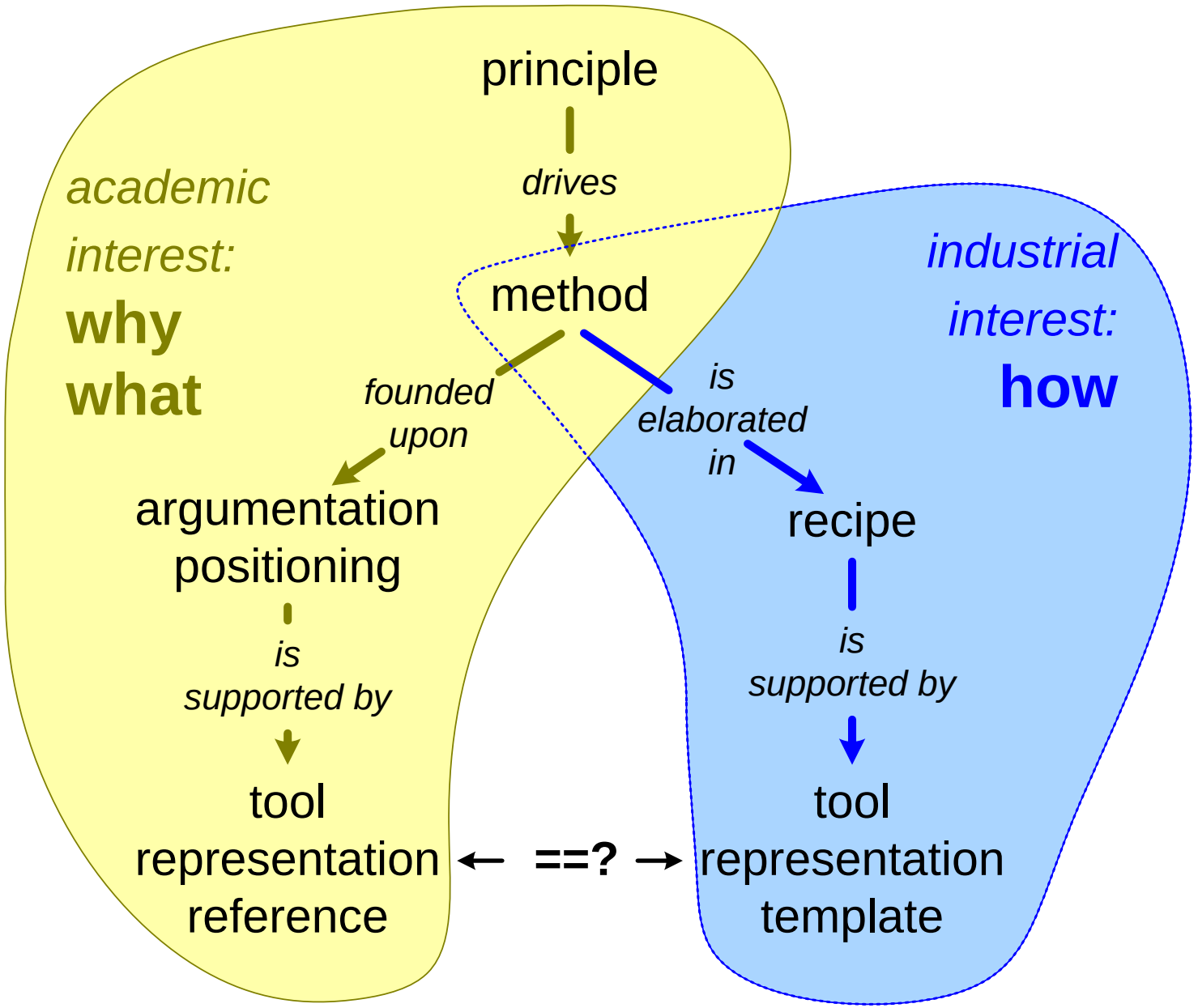
From Mono-Disciplinary to System



The Gap-Size is Multiple Orders of Magnitude



Method Interest is Shared



Industrial Criteria for Articles

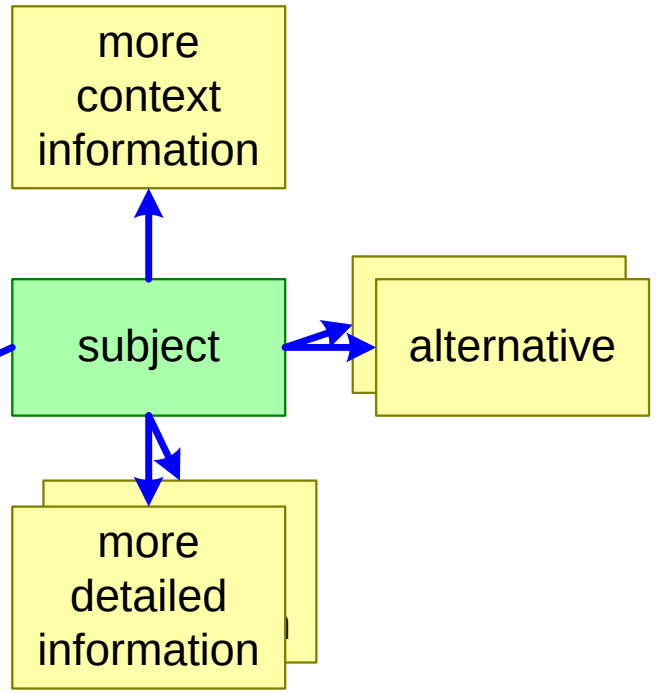
subject
industrial relevance of subject — valuable, useful

goal, solution oriented — broad, integral
how to — practical

other contributors are reviewers
single author — clear responsibility

pointers to related relevant information

clear description
juicy description
understandable
lots of signal, very low noise level



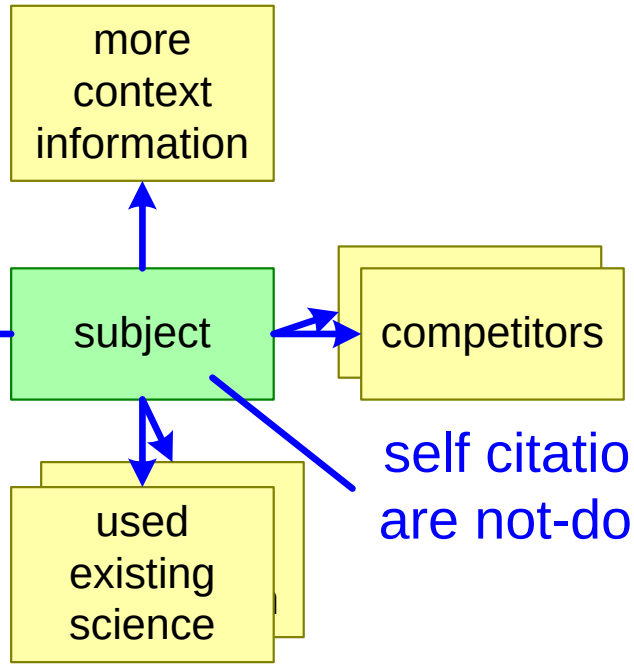
Academic Criteria for Articles

subject
scientific relevance of subject — new, original

knowledge oriented — deep
why, what

all contributors are authors — including reviewers

pointers to related scientific work



clear argumentation
every statement is supported by reference, verifiable facts — self citations are not-done
correct language
clear positioning, well linked in with existing scientific work — blocks broadly interested scientists in development

strong cultural filter in scientific magazines and conferences

Economic Viewpoint on Publications

Industry:

+ writing and reading publications is a cost

+ publications are useful for PR

tension with Intellectual Property Rights (IPR), confidentiality

Academics:

+ number of publications and citations determines

  standing and funding

limits change of research area, because you have to rebuild a reputation and to bootstrap background know how

Comparing the Industrial and Academical Viewpoints

	industrial	*academical*
relevance	useful, valuable	new, original
orientation	goal, solution	knowledge
content	practical, how to	theoretical, why, what
style	clear, understandable juicy, low noise	clear argumentation, no loose statements
references	service to the reader	positioning in existing science
author	single author	all contributors as author
economic driver	writing and reading = cost public relation vs IPR and confidentiality	funding based on number of publications and citations

Value of publications shared by both worlds

writing facilitates overview and understanding

writing milestones help to focus on results

stops endless wandering

Consequences

Different publications needed for industry and academics

some re-use via copy/paste

But how to share information between the worlds?

And how to cross fertilize, how to get inspiration from the other world?

Industry: how to outsource education to academic community?

Academics: how to enter the unknown area?

Solution?

The Embedded Systems Institute (ESI) solution:

collaborative research;

seeding for long term (10-15 years) renewed respect