

Knowledge brokering in professionally integrated PhDs

Student views on opportunities and challenges

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Background: Degrees in bioengineering and teaching (for upper secondary school)

Supervisors:

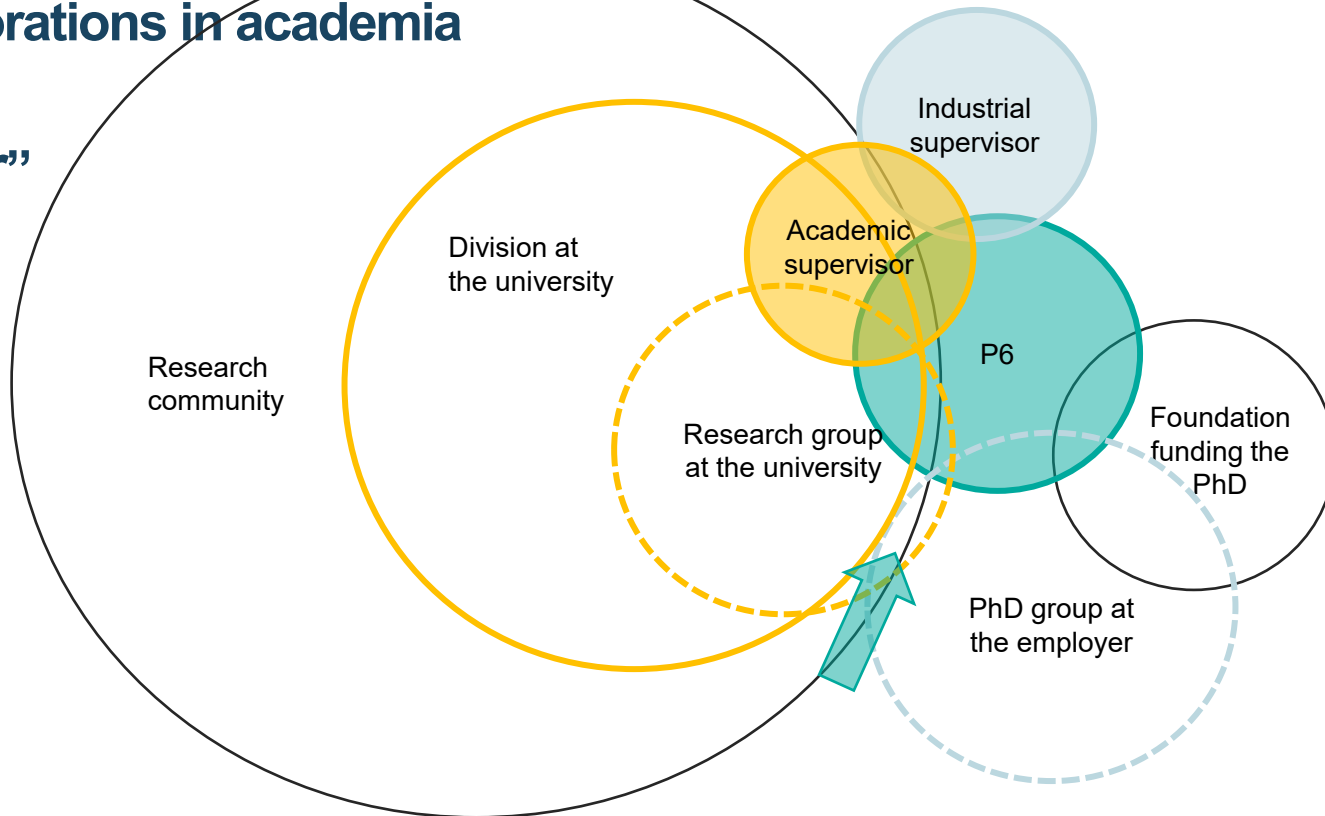
Raffaella Negretti, Chalmers University of Technology

Lisa McGrath, Sheffield Institute of Education, Sheffield Hallam University



Other brokers or links: Research experience in industry and experience of industry collaborations in academia

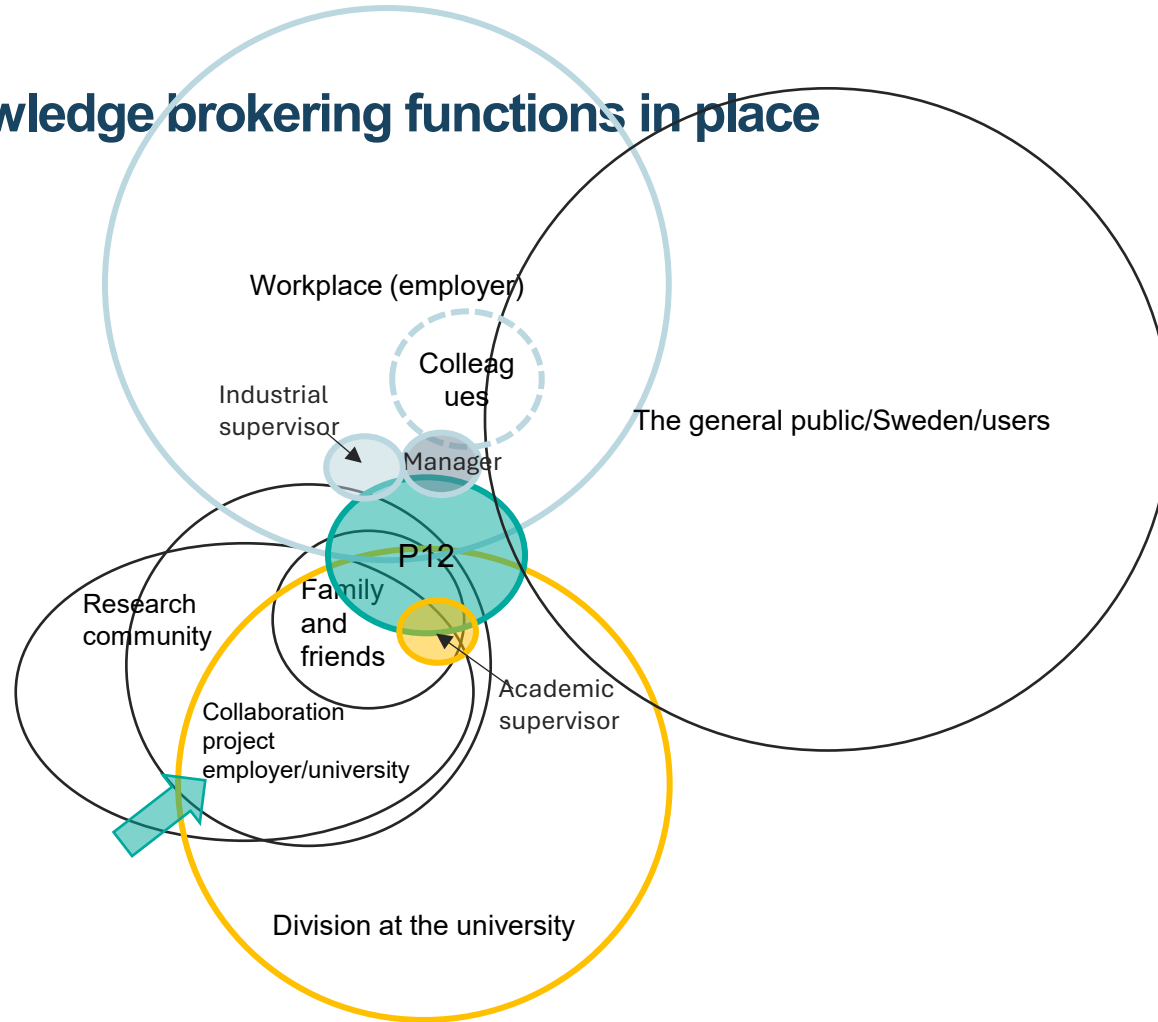
P6 “Peter”



Other knowledge brokering functions in place

P12

“Anna”



Implications: What to improve in the collaboration?

- Structure for the planning phase of an industrial PhD not only a contract for legal purposes
 - Motives for involvement
 - Structure (including structure for follow-up)
 - Inclusion in the two contexts
 - Responsibilities of the two stakeholders as well of the PhD student
 - Expectations
 - Need for supervisor and manager training on challenges and support needed in an industrial PhD, including the knowledge brokering role?
- Continuous follow-up of the project and students including both the academic and industrial context
 - To ensure there is sufficient support and training and that challenges are dealt with.
 - Specific attention should be paid to the students' role as knowledge brokers and potentially peripheral participation in both industry and academia.

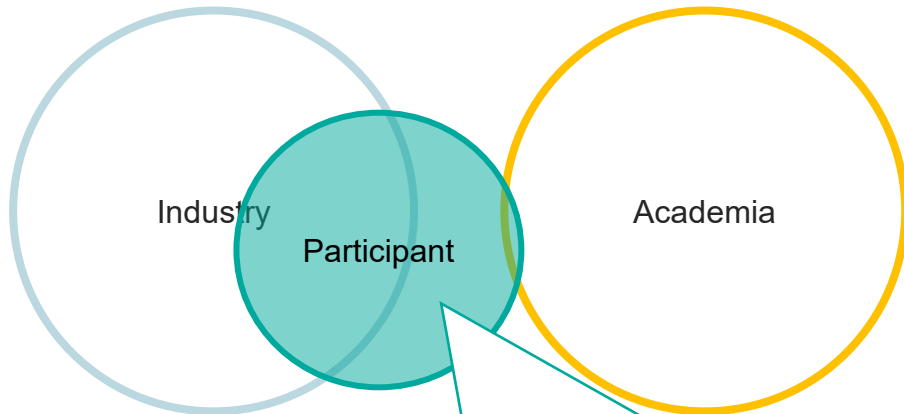
• Factors important for successful collaborations (e.g. Pertuz et al. 2021; Sjö & Hellström, 2019):

- Management and organisation: structure, support for establishing collaboration, encouragement
- Shared objectives and mutual understanding of academia and industry needs
- Effective communication
- Boundary spanning functions, or knowledge brokers (c.f. Wenger, 1998)





Where do you see yourself in the future?



In industry mainly, but keeping a connection to academia and continuing to bridge the gap.

Findings:

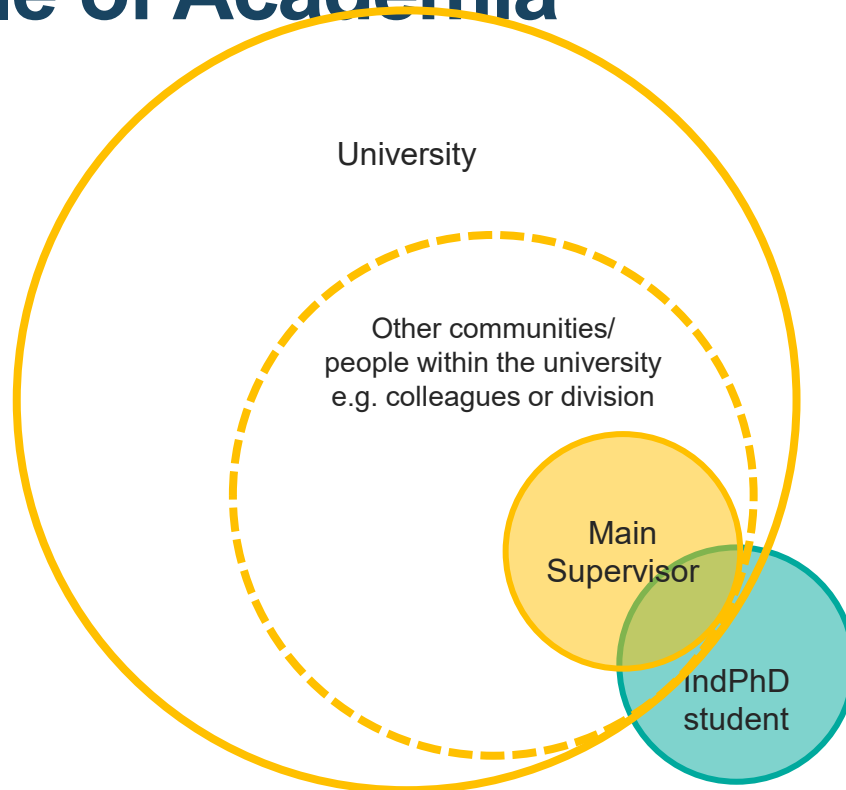
Role of the industrial PhD student

- Industrial PhD student as the only broker between the employer and the university (P2, P3, P4, P7, P8, P10, P11)
 - But industry experience in academia (P11)
 - But research experience in industry (P3, P10)
- Other brokers or links (P1, P5, P6, P9, P12):
 - Research experience in industry and experience of collaboration with industry in academia (P1, P6)
 - Other knowledge brokering functions in place (P5, P9, P12)

How was brokering perceived?

- Almost all described a great opportunity to do research that is relevant and for knowledge brokering
- Most participants did perceive a gap between industry and academia.
- They found it challenging to combine the two worlds, to get industry to understand and sometimes to make things academic enough.
- Overall brokering was particularly challenging in the industrial context
 - Why? And what to improve?

Implications: Role of Academia



- Similar across participants
- Little change over time
- Main supervisor among top 2 important people for participants
- Clear expectations
- Peripheral or not?
- Community for industrial PhDs?

What to improve?

- Inclusion of industrial PhD students
- Courses targeting industrial PhDs
 - Communication
 - How to deal with industry?
- Build community of IndPhD students

Implications: Role of Industry

- Connection to employer varies
 - Sometimes other communities rather than employer
 - Often peripheral?
- Often lacking interest => up to the student to take/make a role and create interest
- Manager: enabler (money, support) or barrier
- Reorganisations: Common and often make connection to employer and manager less close
- Changes initiated by the student instead positive for the sense of belonging to a community
- Industrial supervisor: Their role vary, e.g., networking, co-authoring, discussion partner or no real role at all



What to improve?

- Understanding of what a PhD and academic research entails
- Show interest: why an industrial PhD?
- Inclusion— whatever that should entail
- Be careful in reorganisations
- Enable (not provide barriers)
- Help with visibility/network/application
- Role of the industrial supervisor?

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What's the goal with an industrial PhD? Is brokering in the peripheries or participation in both the best?

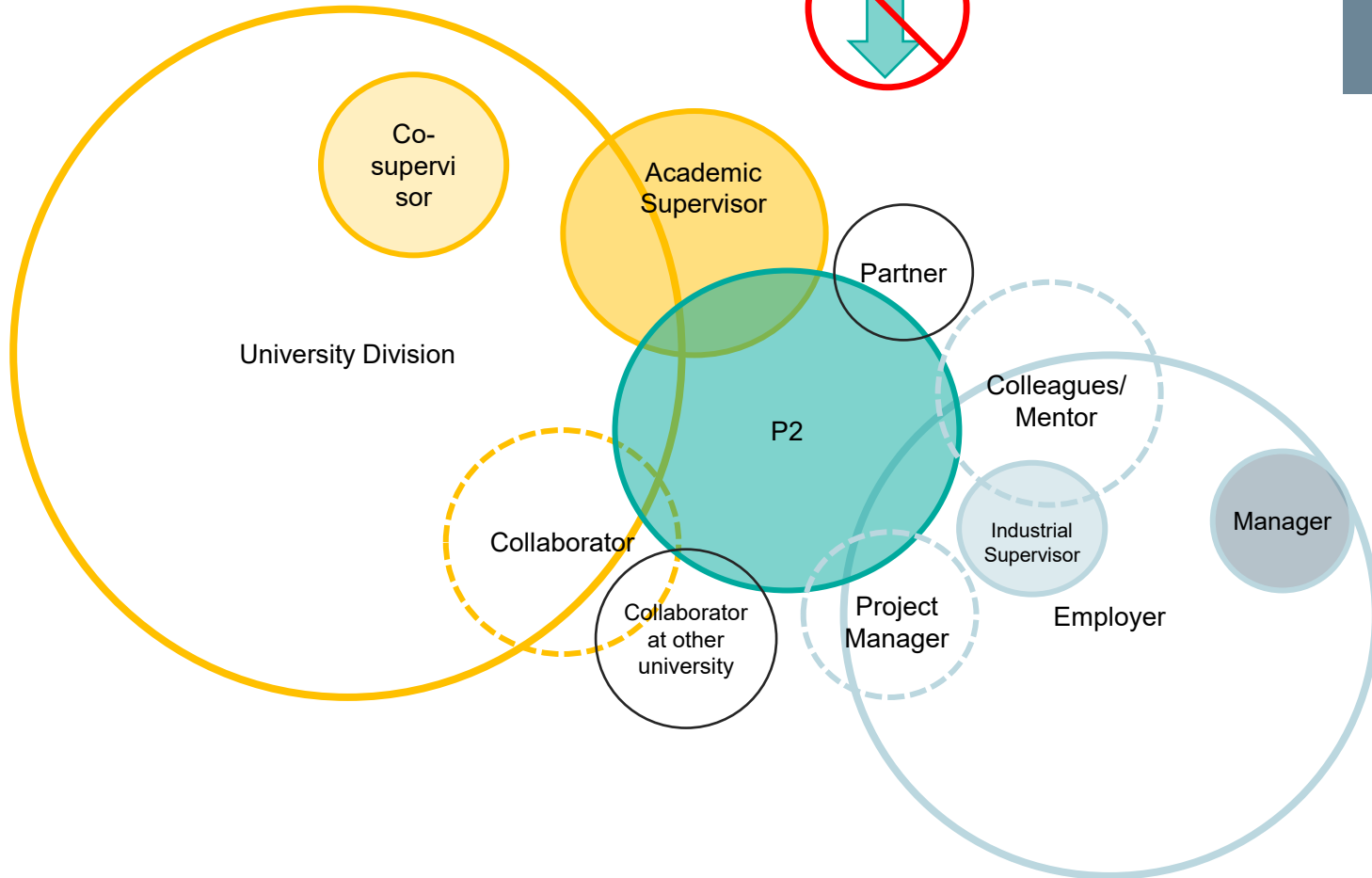
“I am part of industry and university, but it can feel quite alone, because I’m not fully belonging to any group.” (Survey participant)



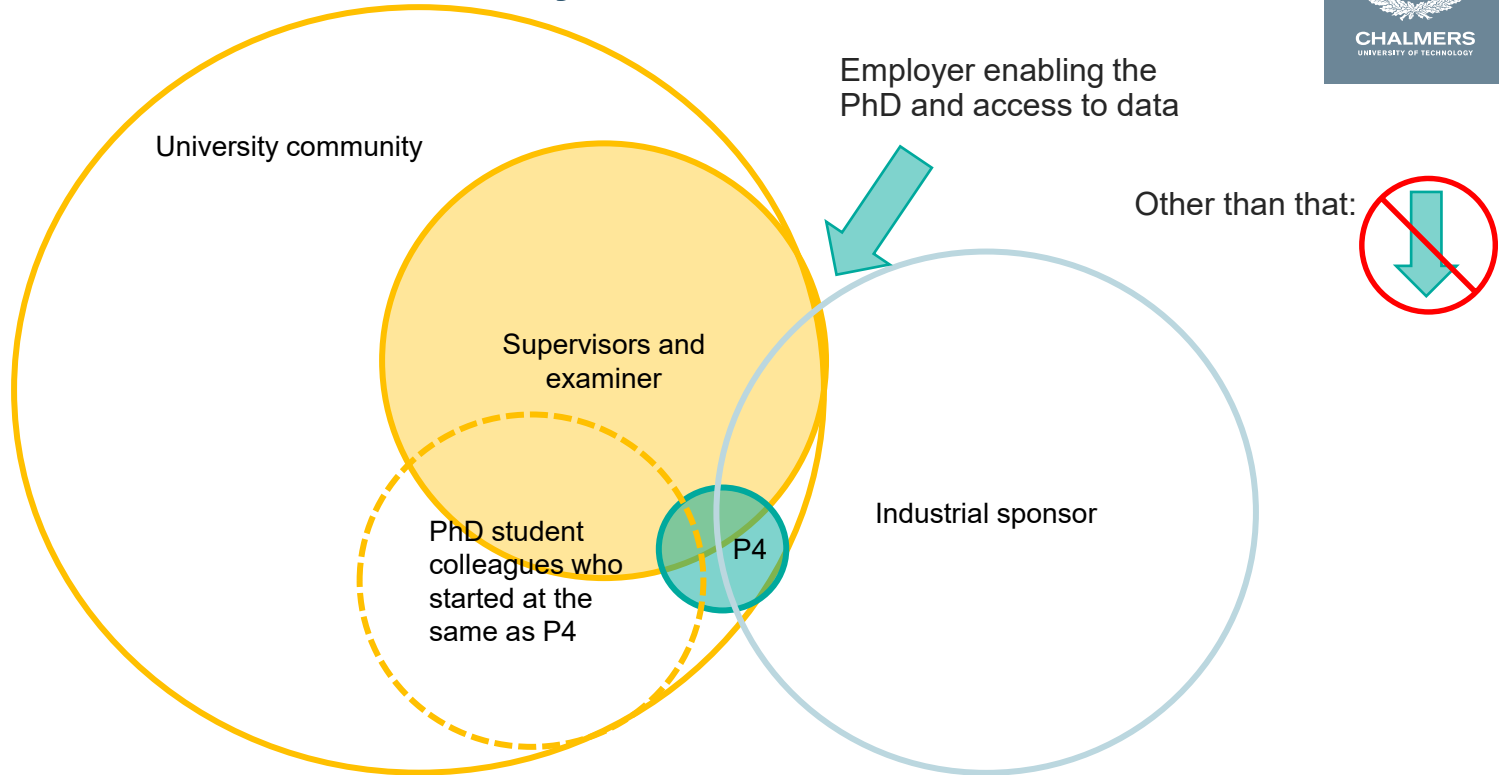
“I feel like I’m in the middle of both [the employer and the university circles].” (P12, “Anna”)



Industrial PhD student as the only broker P2

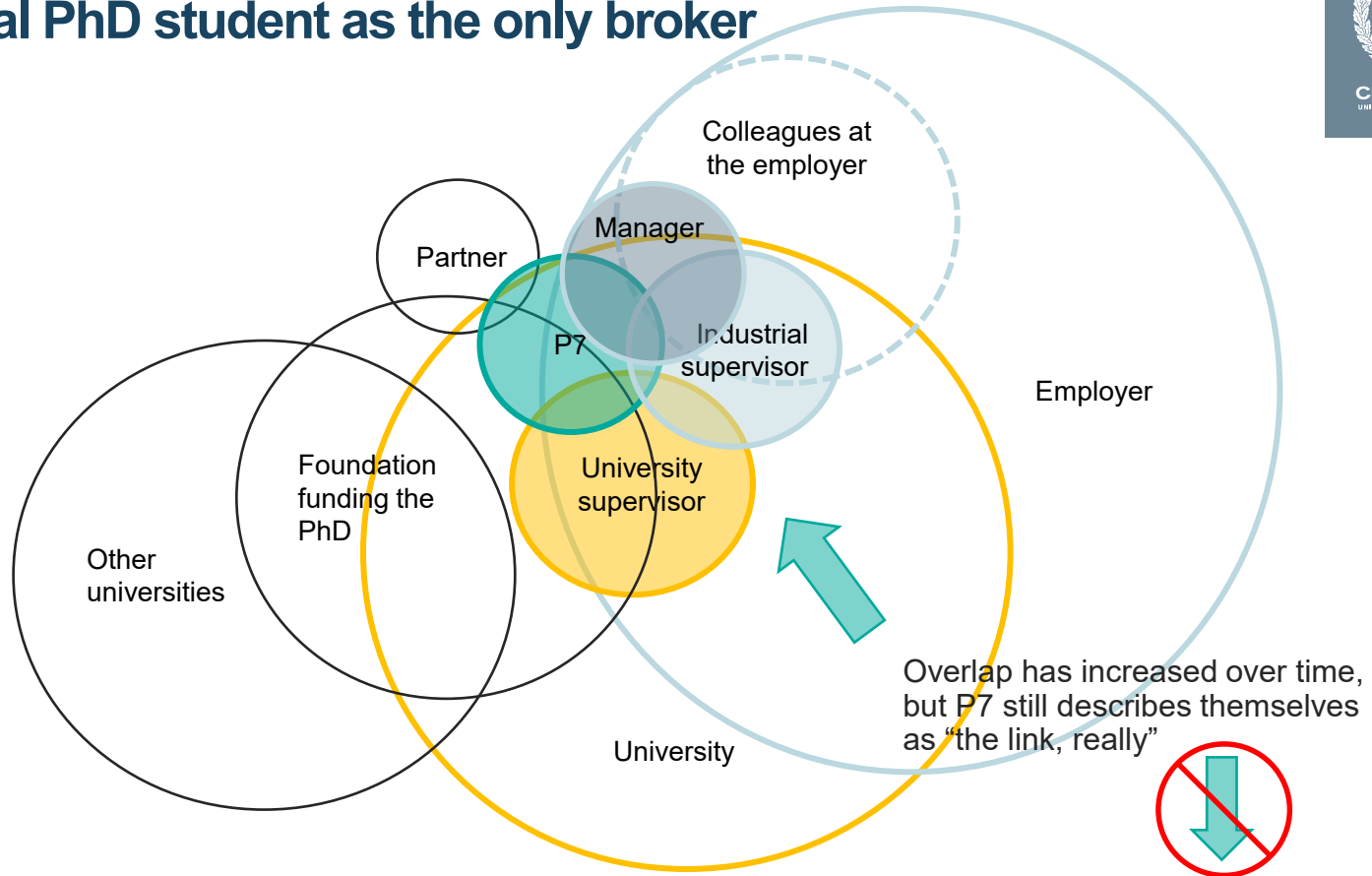


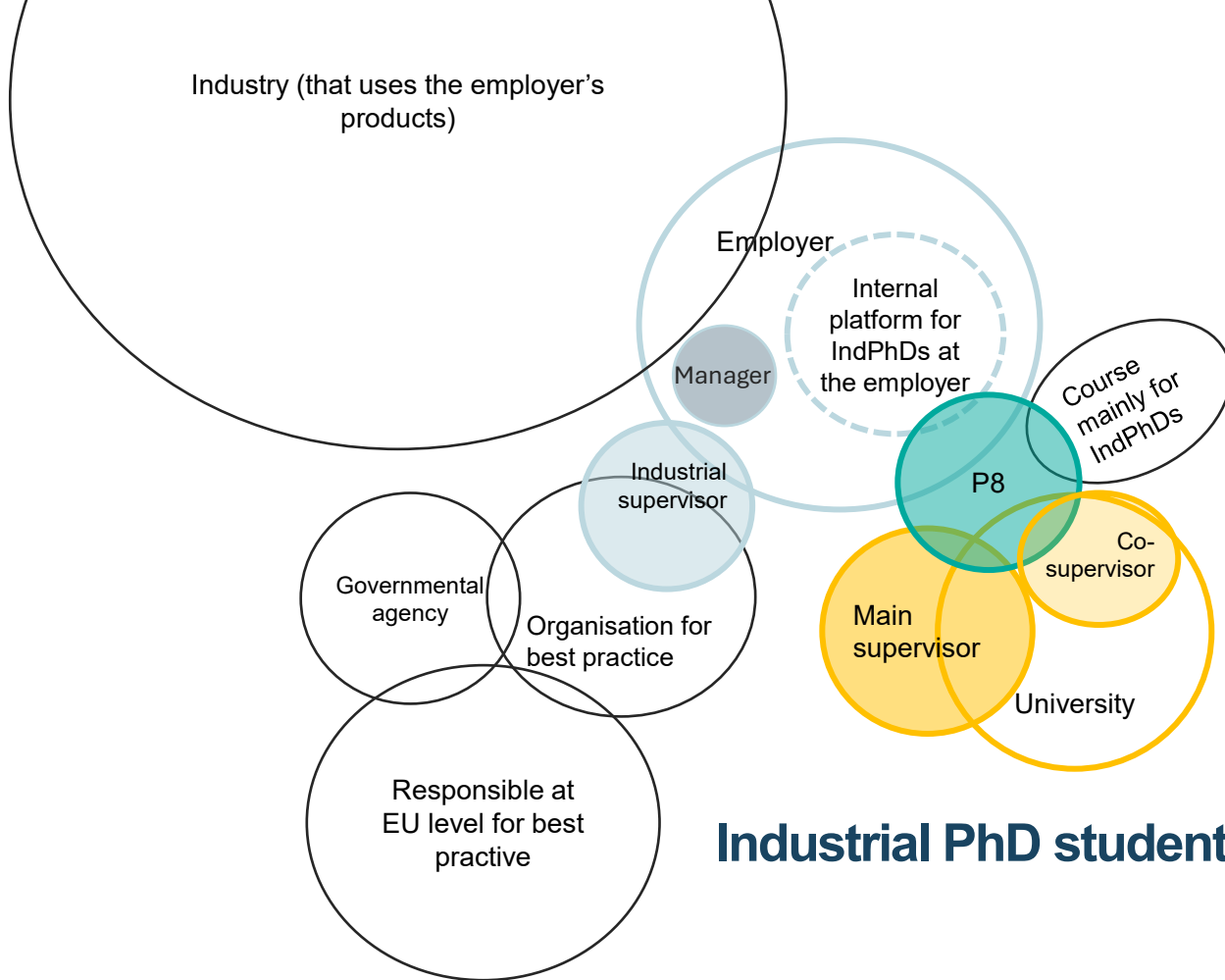
Industrial PhD student as the only broker P4



Industrial PhD student as the only broker

P7



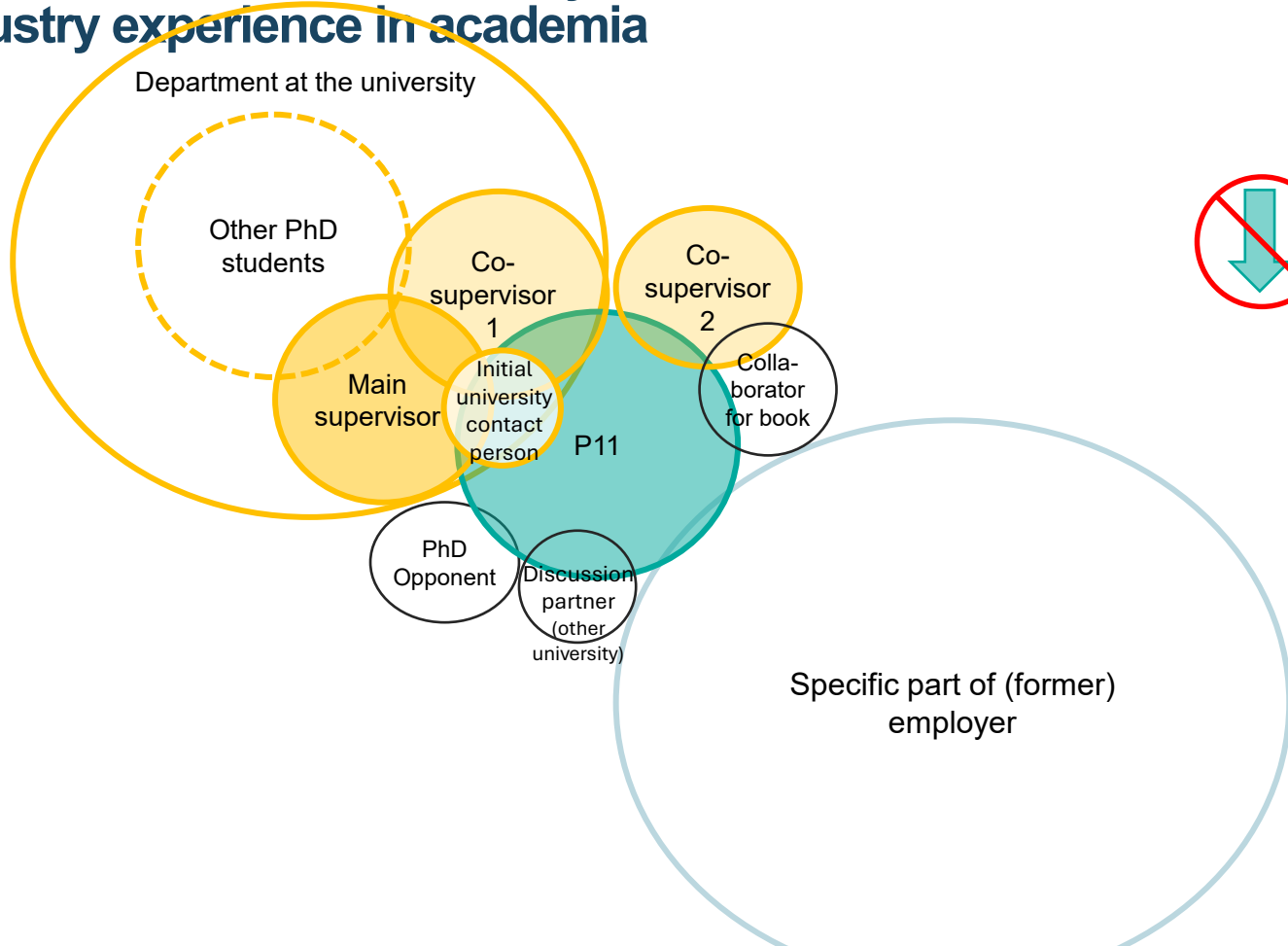


Industrial PhD student as the only broker

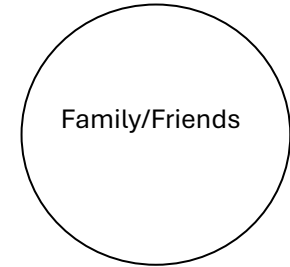
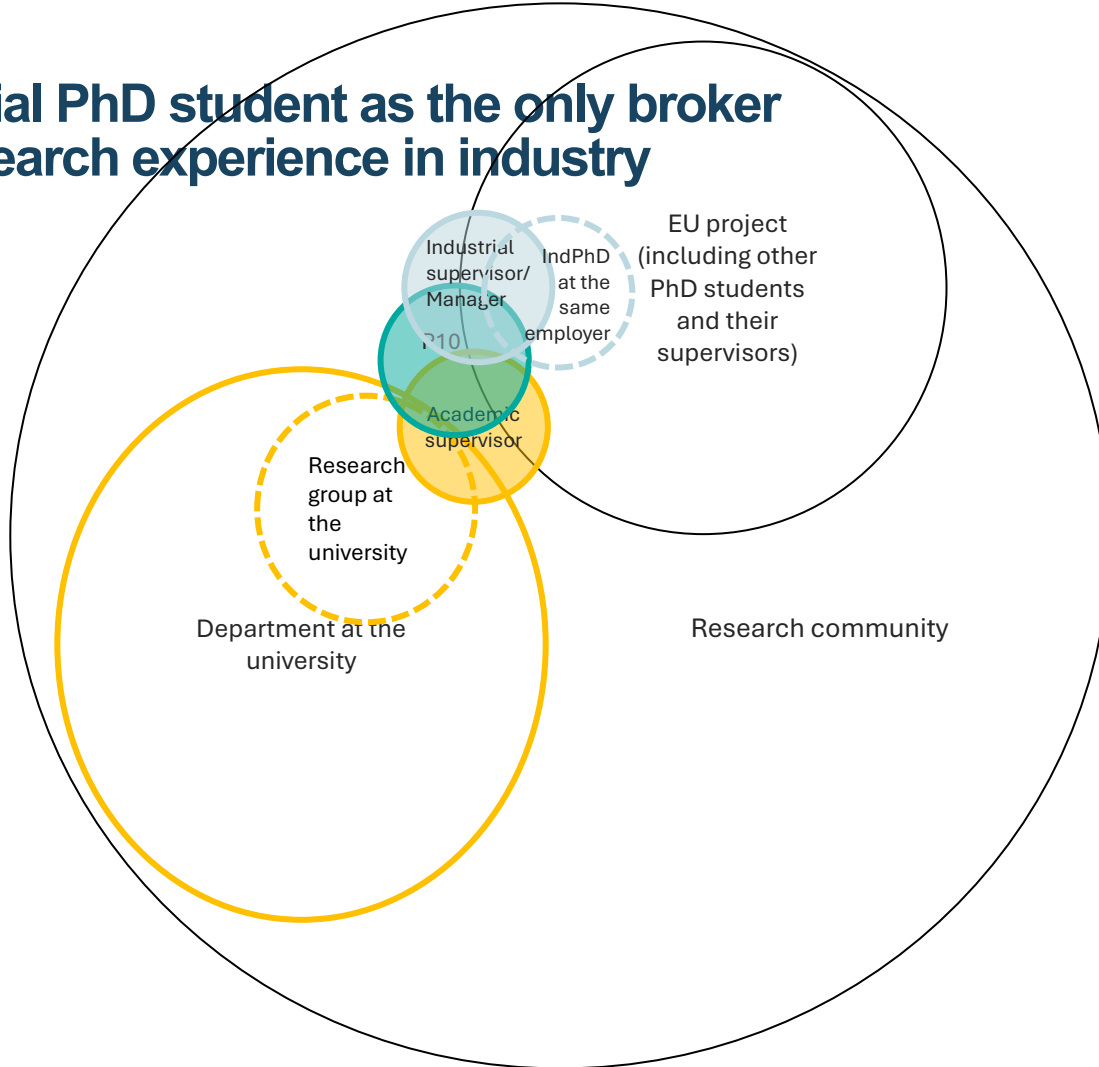
P8

Industrial PhD student as the only broker but industry experience in academia

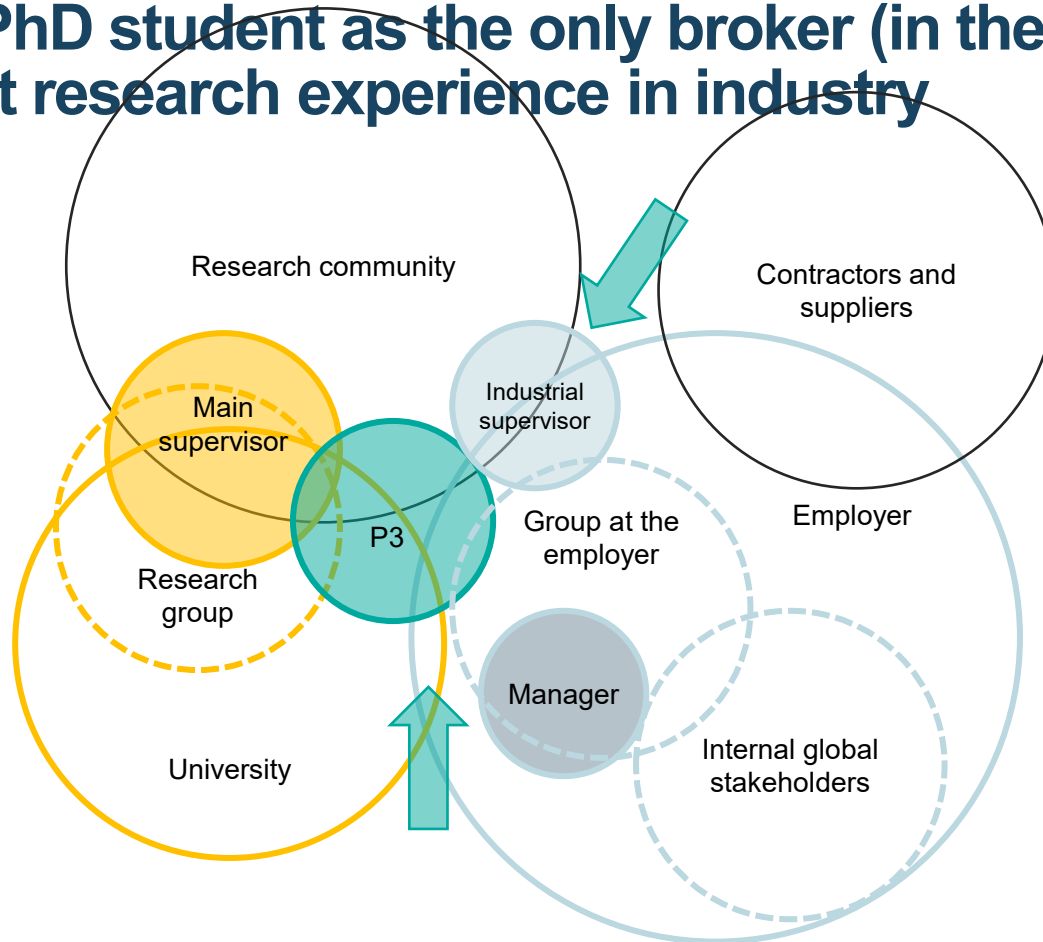
P11



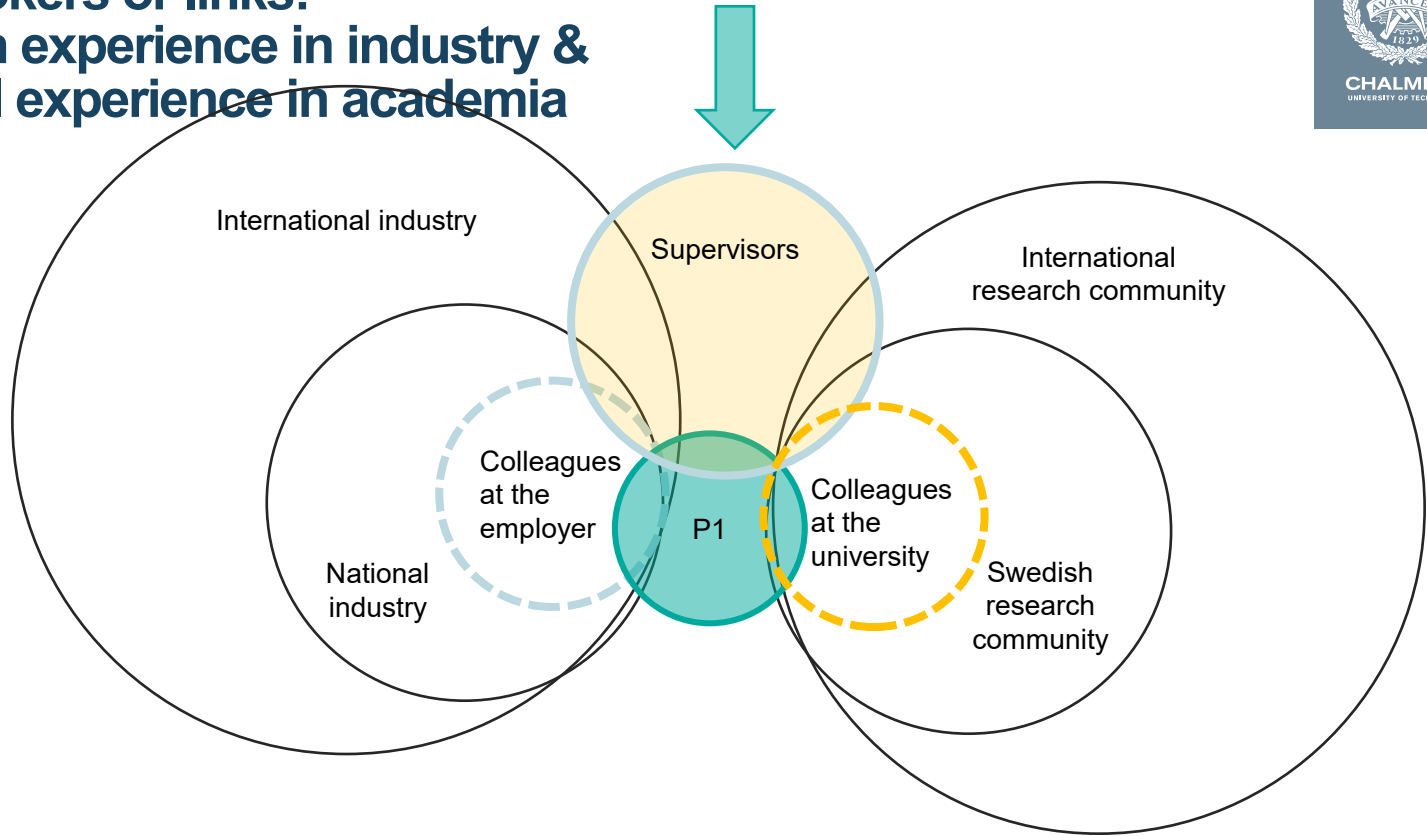
Industrial PhD student as the only broker but research experience in industry P10



Industrial PhD student as the only broker (in the project) but research experience in industry P3

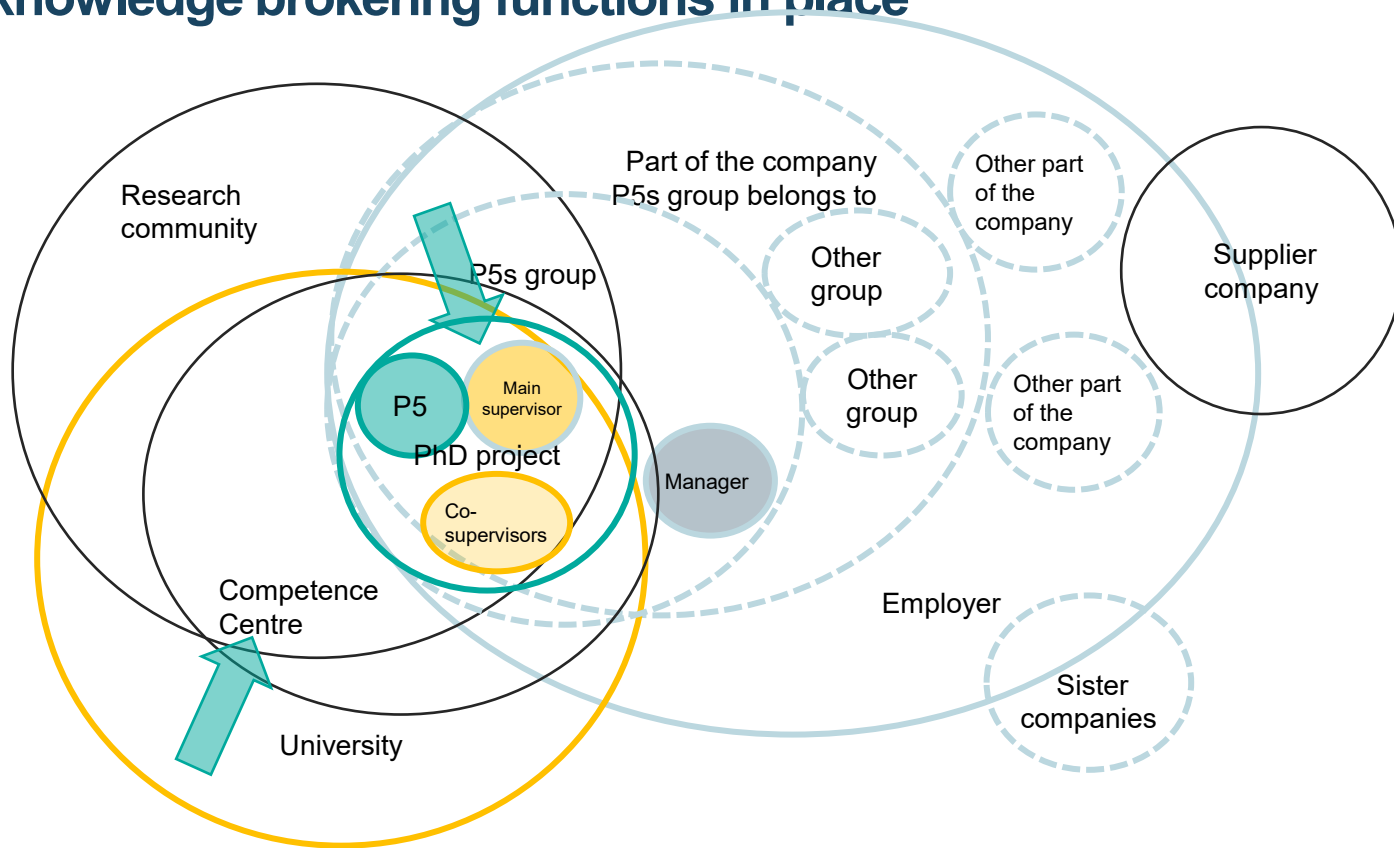


Other brokers or links: Research experience in industry & Industrial experience in academia **P1**



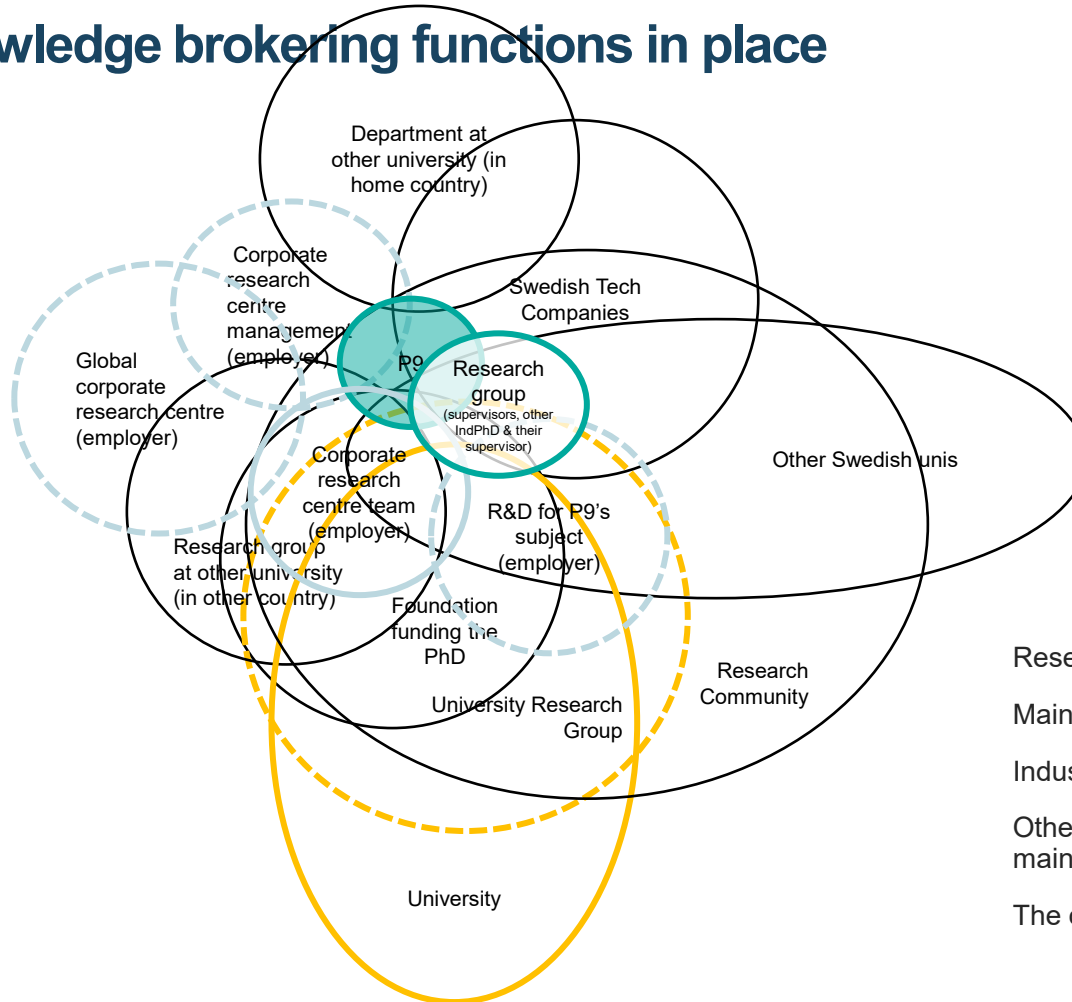
Other knowledge brokering functions in place

P5



Other knowledge brokering functions in place

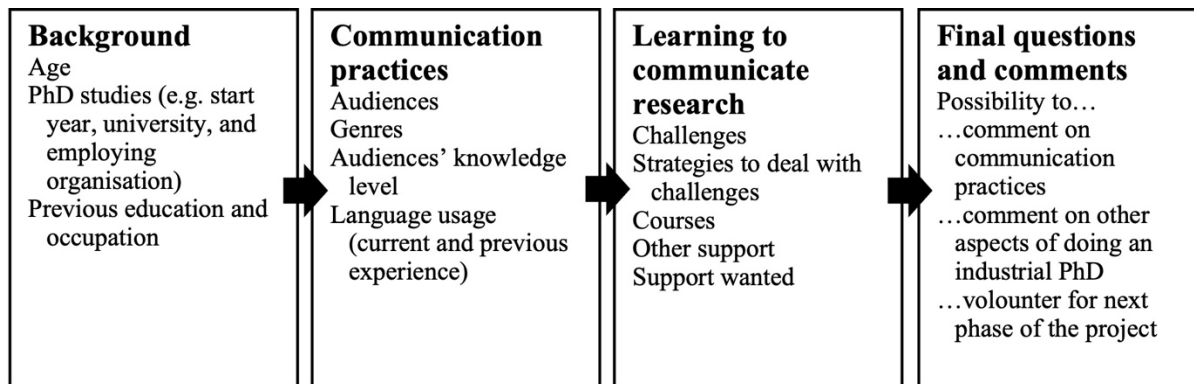
P9



- Research group:
- Main supervisor
- Industrial supervisor
- Other industrial PhD student with same main supervisor
- The other student's industrial supervisor



Questionnaire



Findings, part 1:

Challenges and potential of the industrial PhD



Communication

a challenging learning opportunity to communicate research to various audiences

“Communicating as an industrial PhD required **more work than a normal PhD**... This is more challenging, but you constantly have to make sure that you are focusing on useful things (suggesting this is positive).”

“I think it’s positive that I’ve had **better opportunities to reach out with my research**... I think this will be useful when I’m done with my PhD.”

“To be an industrial PhD student **gives great training in communicating your research to different audiences and adapt to the audience.**”

Brokering

needed to ensure shared objectives and mutual understanding

“There are many aspects that need to be balanced between industry and academia, and lots of alignment is necessary and the need to find common ground and avoid competing interests. The work as an industrial PhD involves both clarifying research interest to the company as well as clarifying business interests to academia.”

Lacking support and unclear identity

including lacking routines and training, and the challenge of having two professional identities

“My experience is that there is a **lack of routines for how to deal with and include industrial PhD students.**”

“I am part of industry and university, but it can feel quite alone, **because I’m not fully belonging to any group.**”

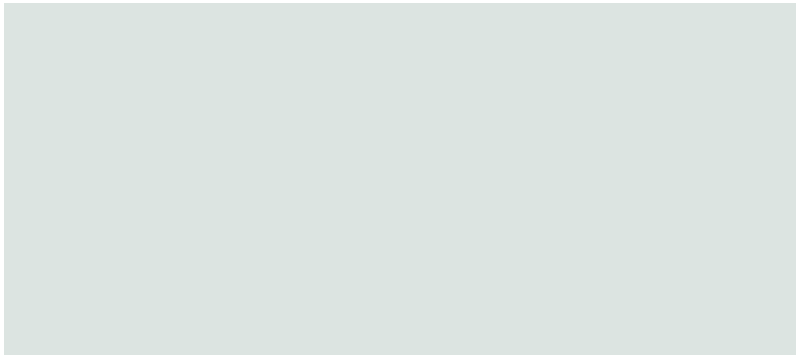
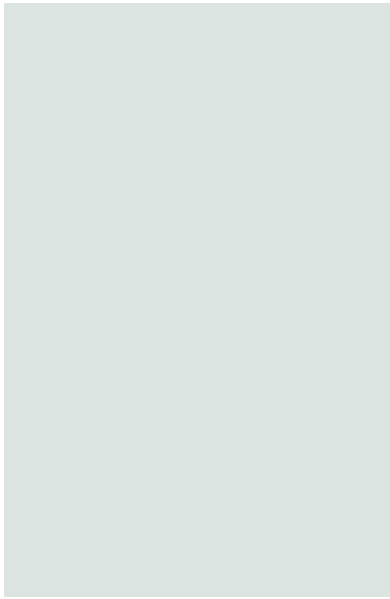
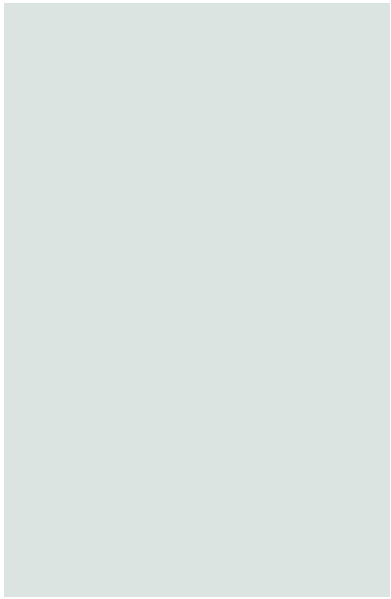
“**Very little of the information, courses and training available** have this type of PhD student as a target audience. **Challenges, needs and opportunities - in communication and otherwise - are quite different when you have "two jobs" and in a way two different professional identities.**”

Potential of the industrial PhD

contributing to bridging the gap and increase collaboration between academia and industry, if challenges are addressed

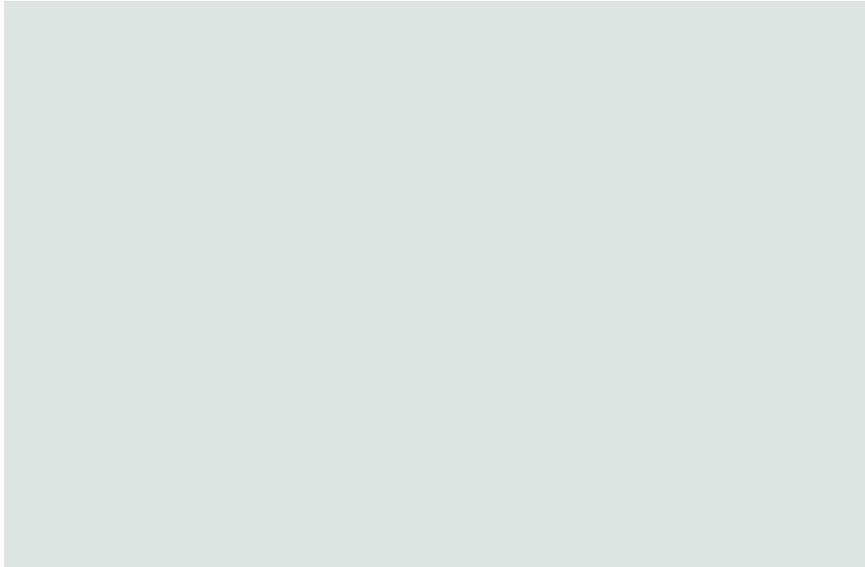
“It takes research closer to industry and makes faster application of research results possible.”

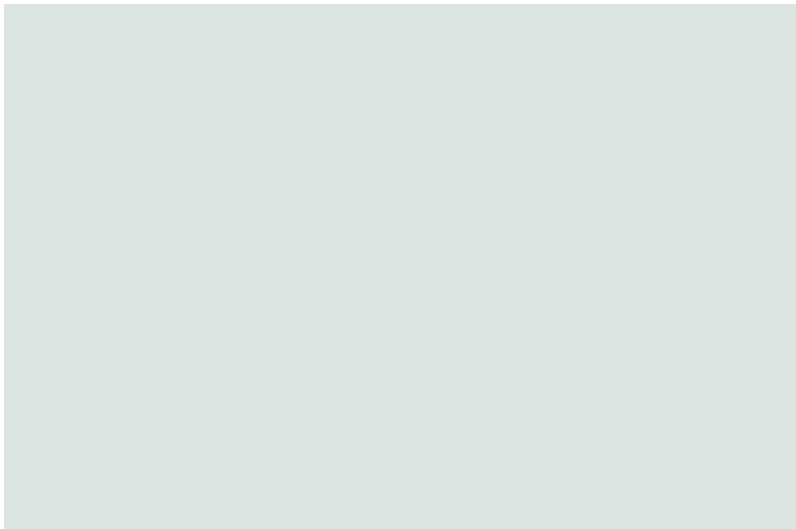
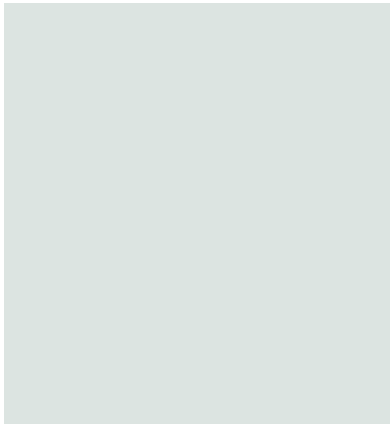
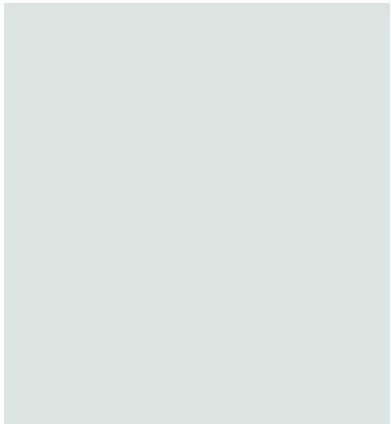


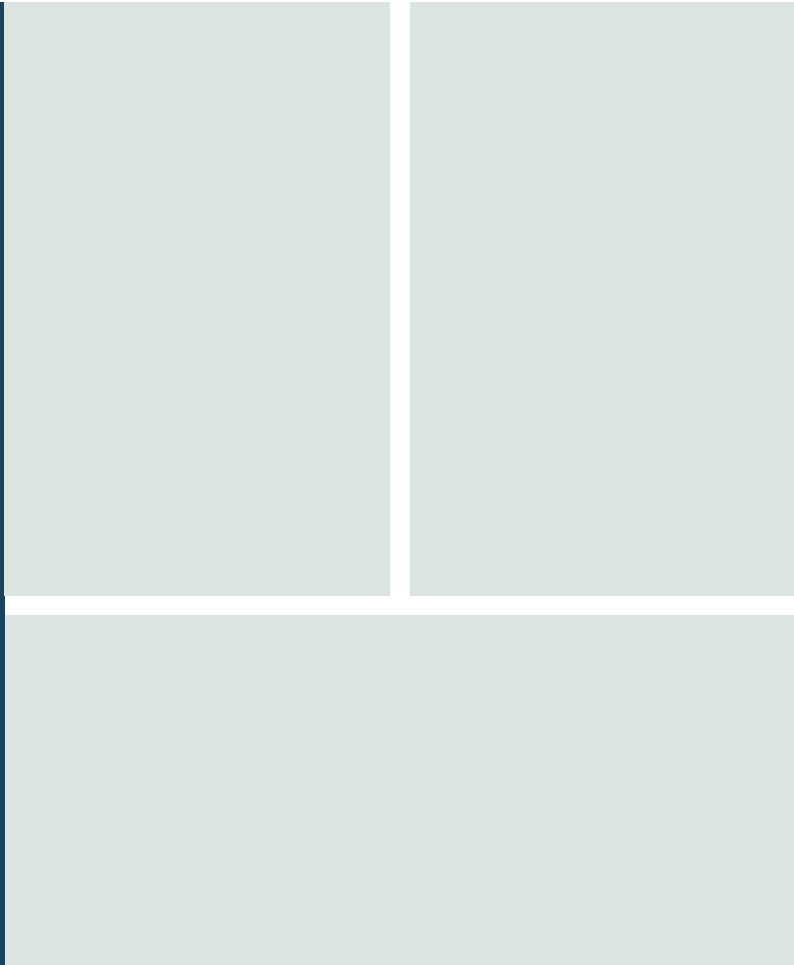


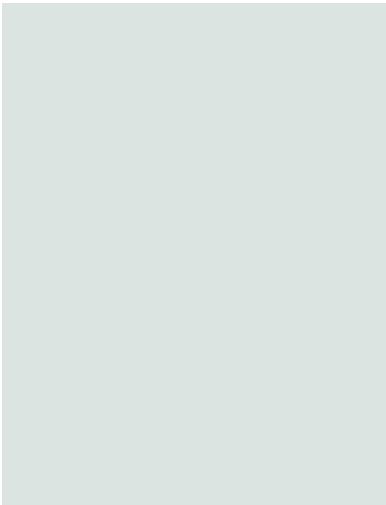
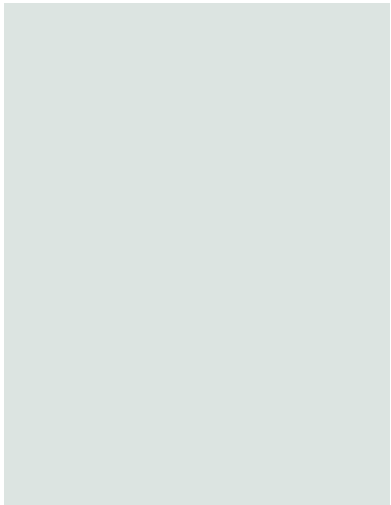
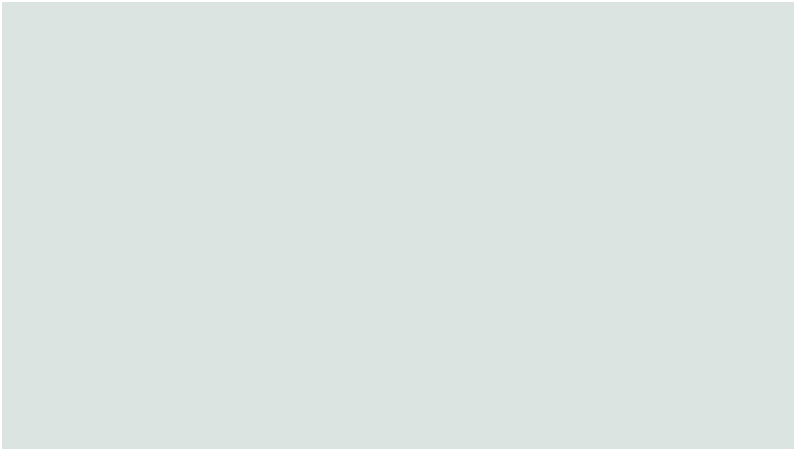


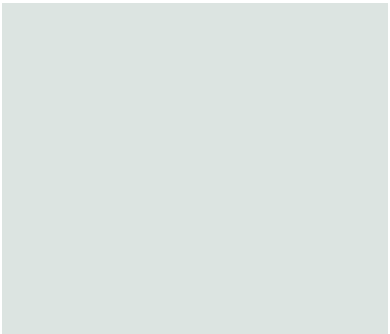
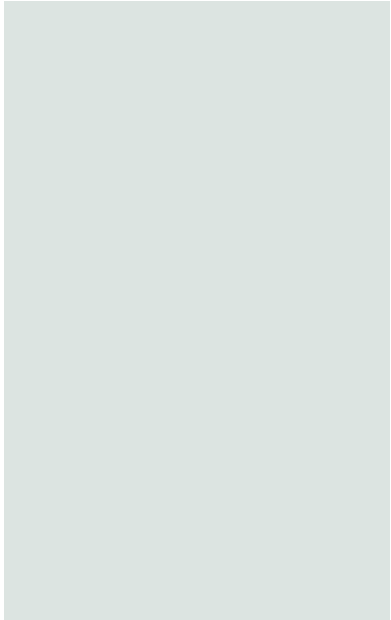
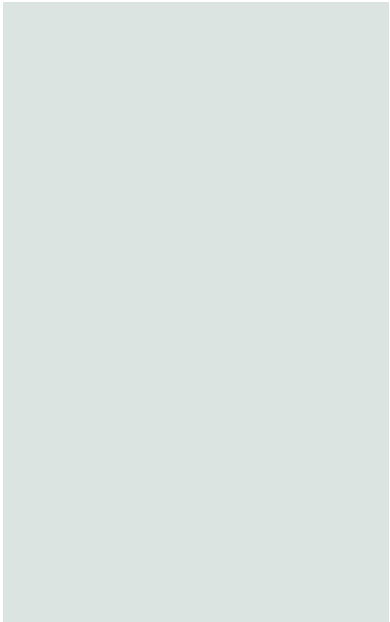
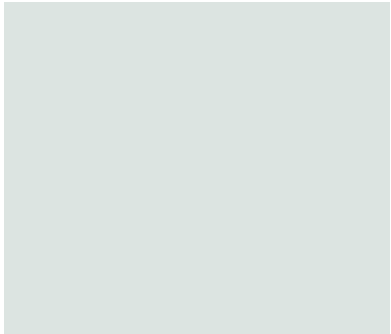
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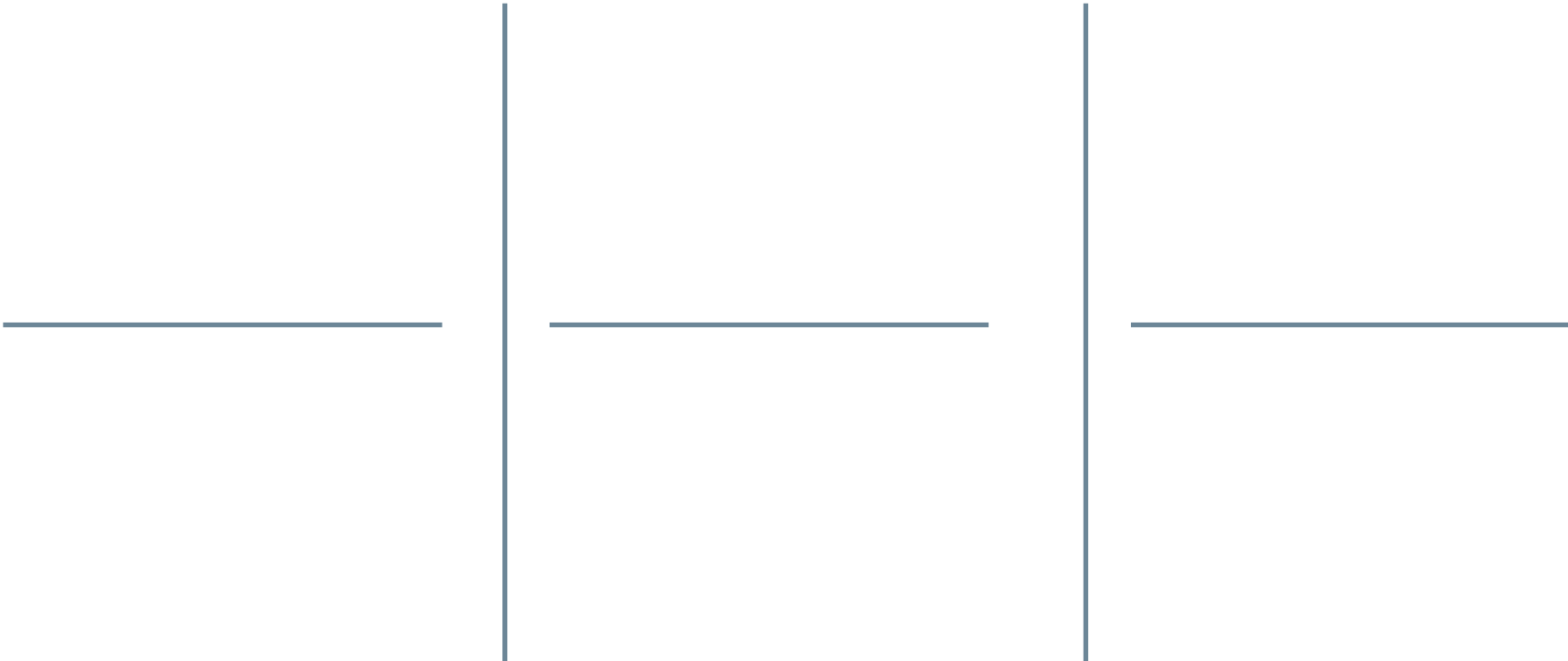








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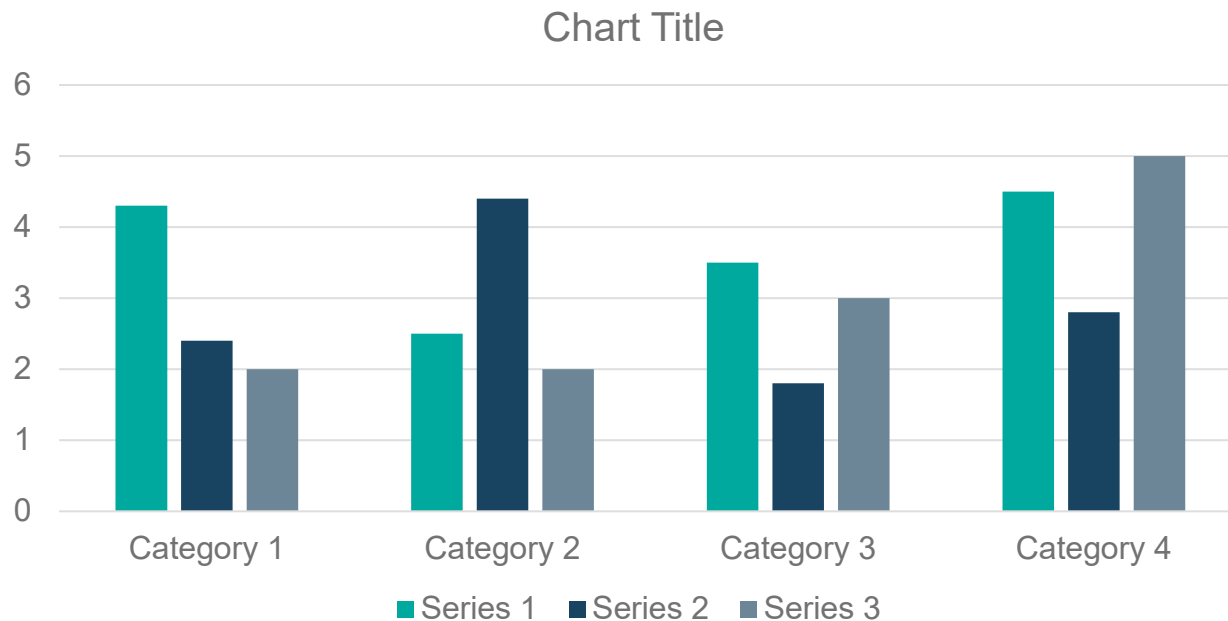
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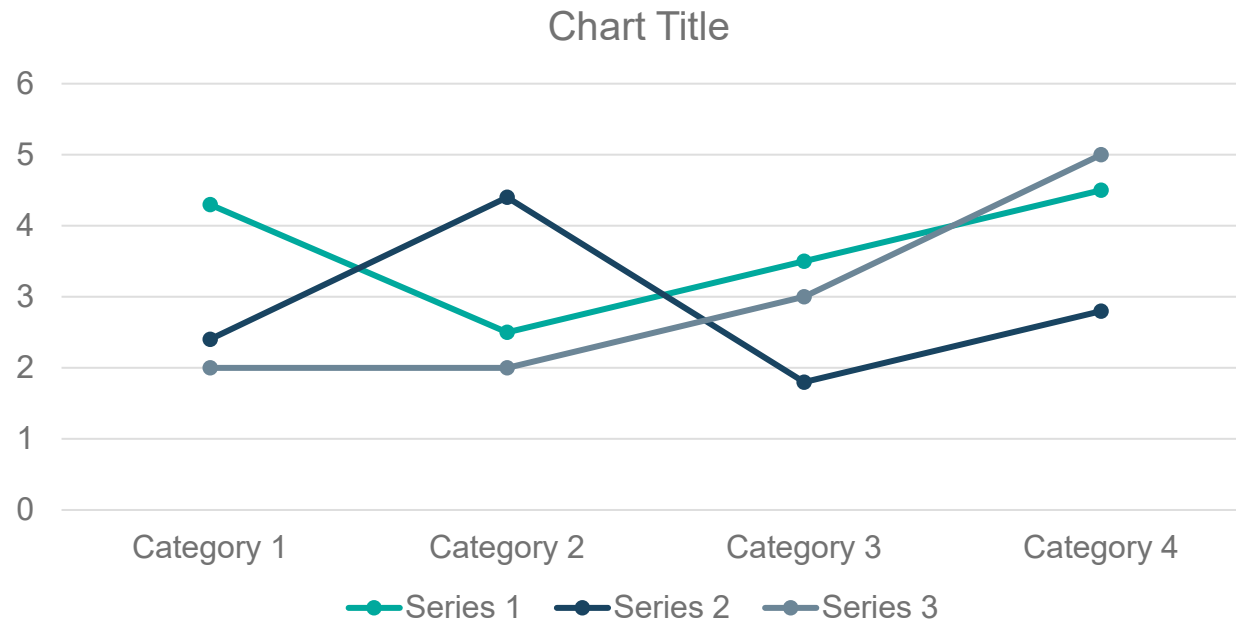


Column chart example





Line chart example





Other chart type, two examples

Chart Title

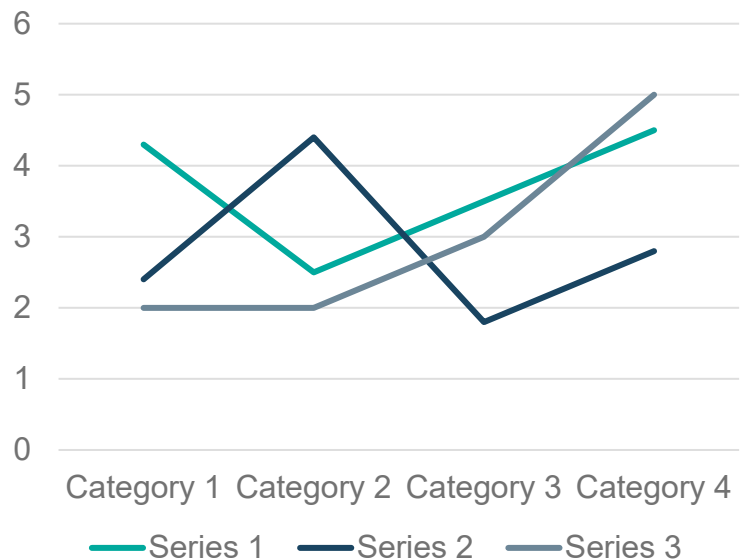
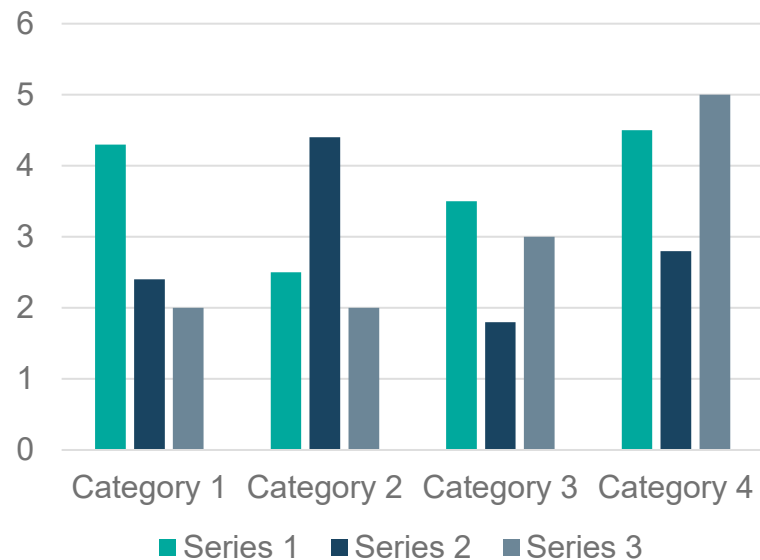


Chart Title





Other chart type, three examples

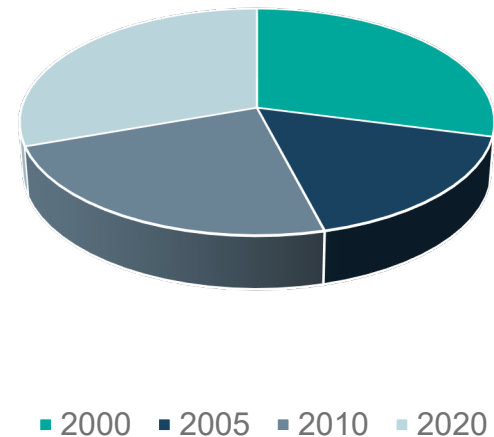
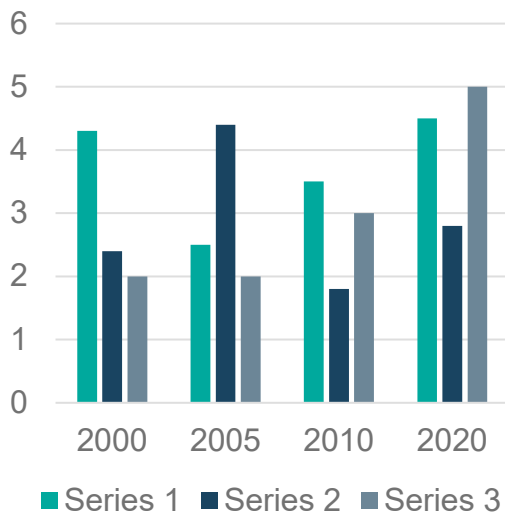
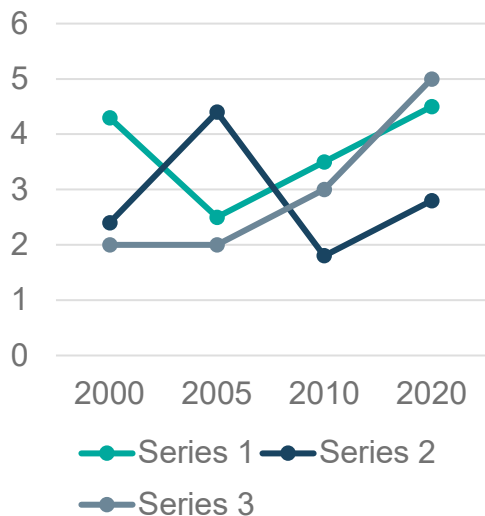
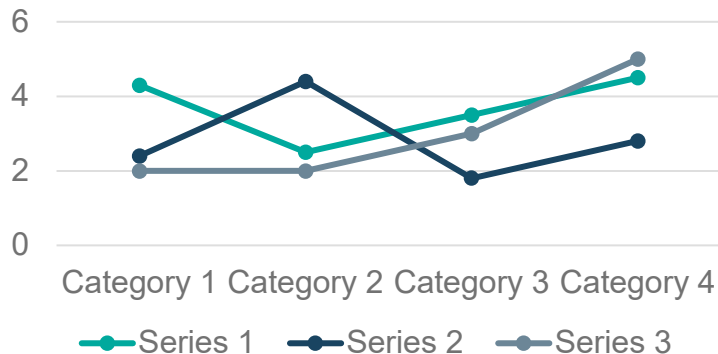
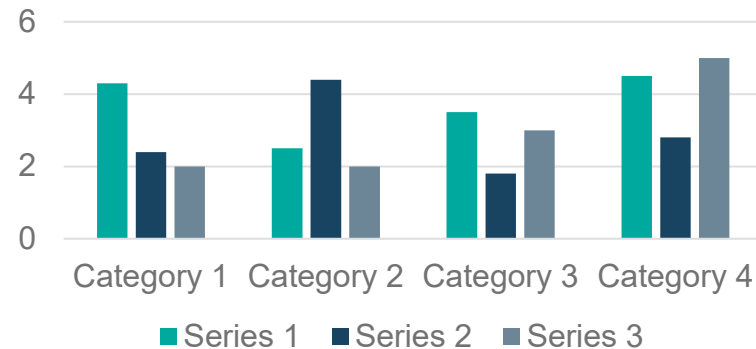


Chart and text examples



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Table example

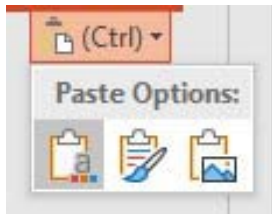
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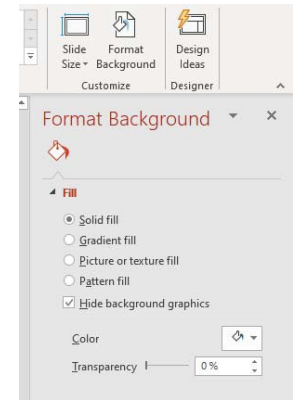


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