

Experience from a Program for Accelerating the Creation of T-shaped Technical Leaders

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The problem in complex product development



What are the factors of personal knowledge and leadership coping with these challenges?

Why do engineers experience it was easier to develop this aircraft...



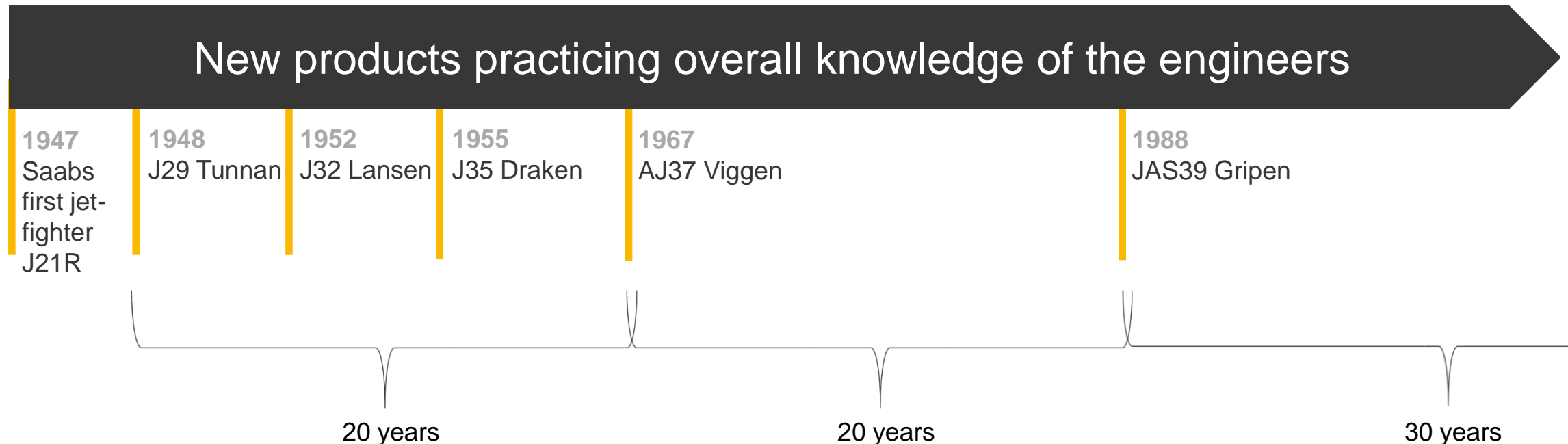
...than this aircraft?



Example from history to show the challenge

Past: An engineer could during his/her career work in *several* development projects and type of platforms

Today: Difficult to achieve experience broad enough, despite long career within the company...

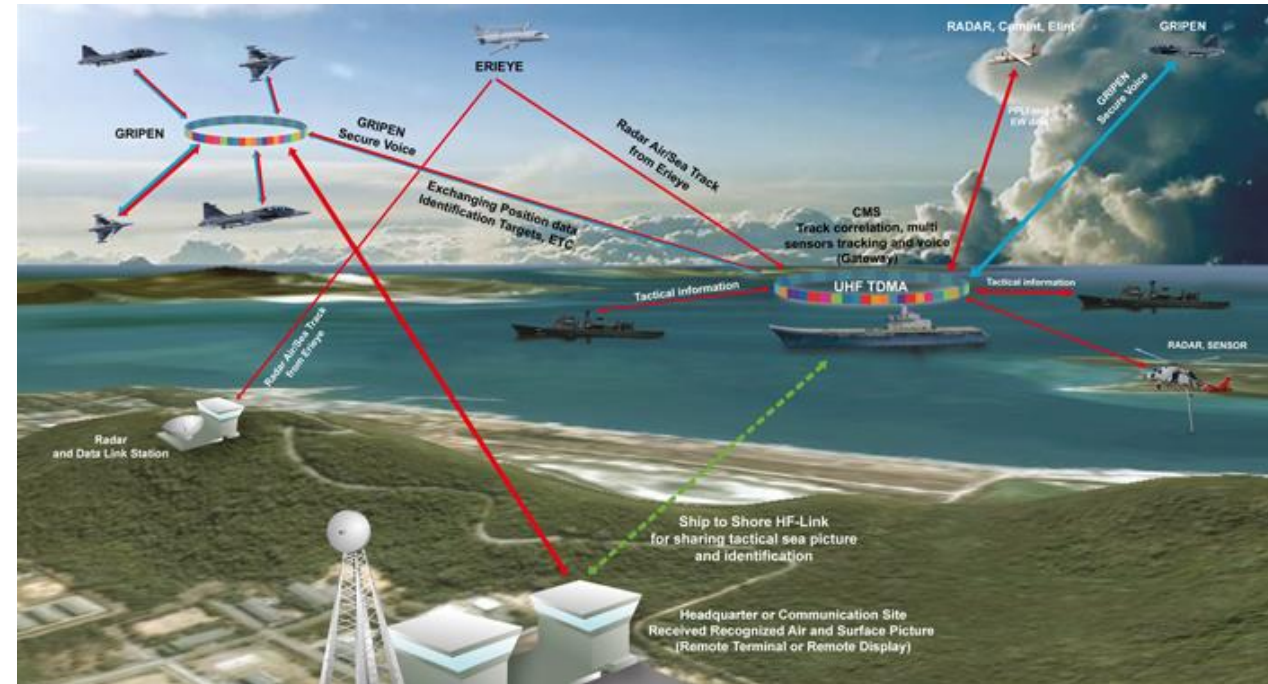


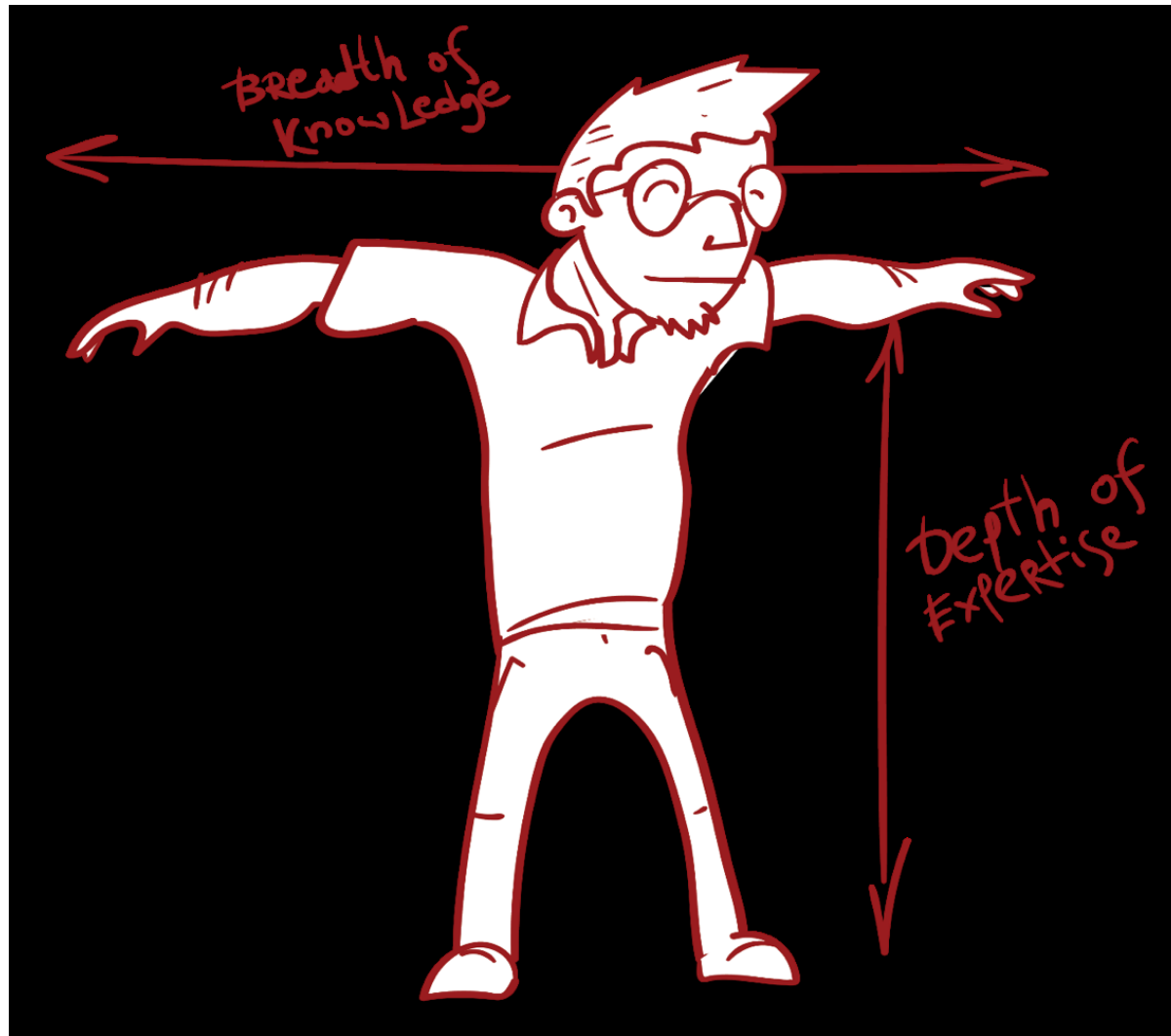
Why do engineers experience it more difficult nowadays?

- Consequence:
 - Harder to replace older, very experienced leaders
 - Fewer younger engineers with the deep and broad experience that is needed
- Also: The complexity of systems of today and future systems is *much* higher than before
 - Increasing amount of software
 - Future systems of systems

The result:

The set of desired competencies is larger today than a generation ago!



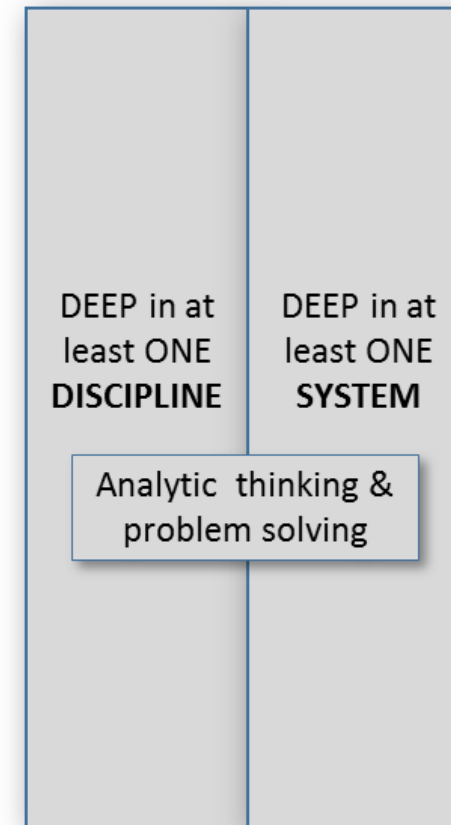


T-shaped technical leader

Both specialist and generalist!

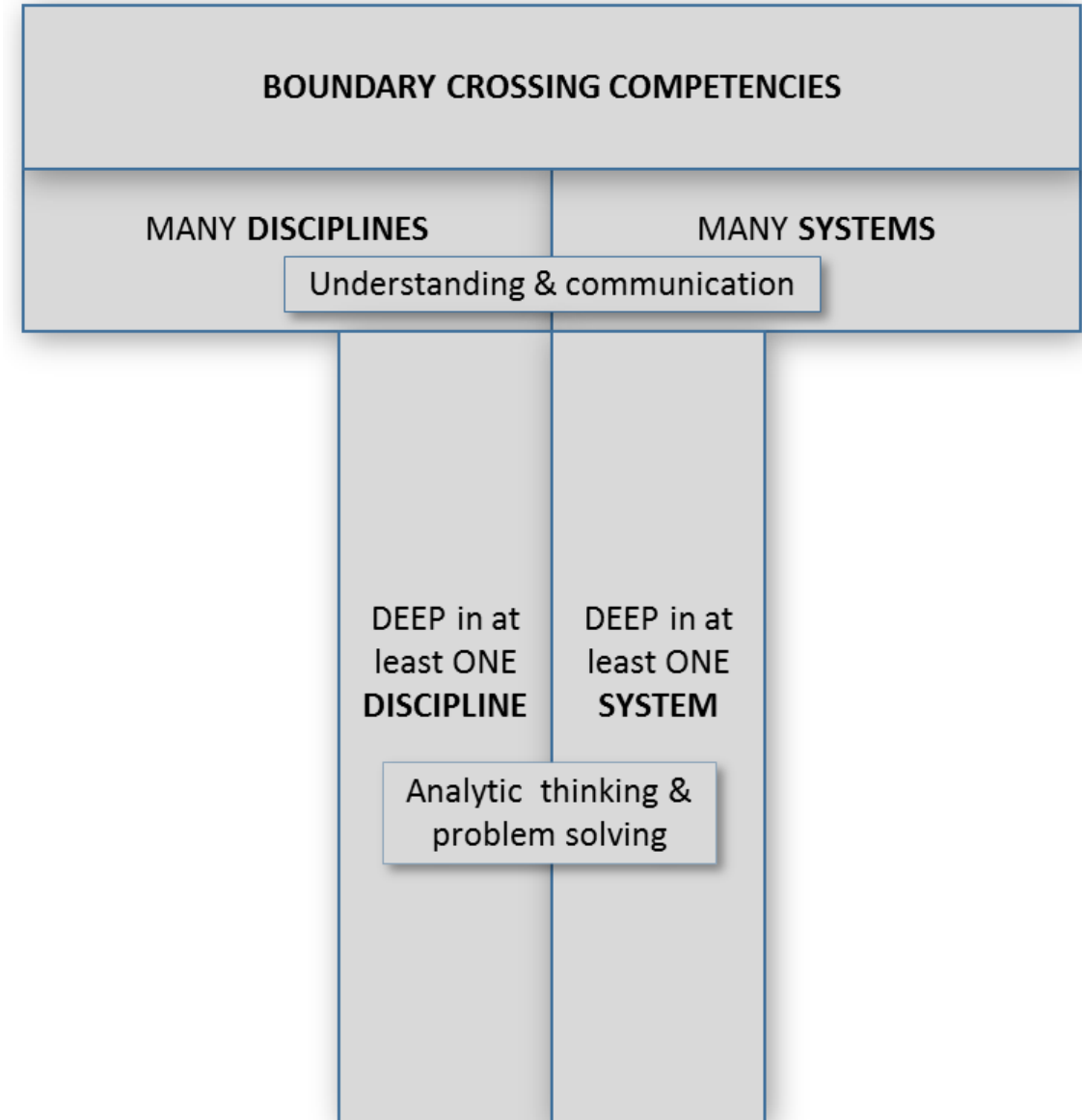
I-shaped engineer

- A typical I-shaped engineer knows his/her system and discipline, and has deep knowledge within this
- Feels at home only in this discipline/system
- Need a translator/bridge-builder
 - To spread knowledge
 - Understand other peoples ideas and thoughts



T-shaped engineer

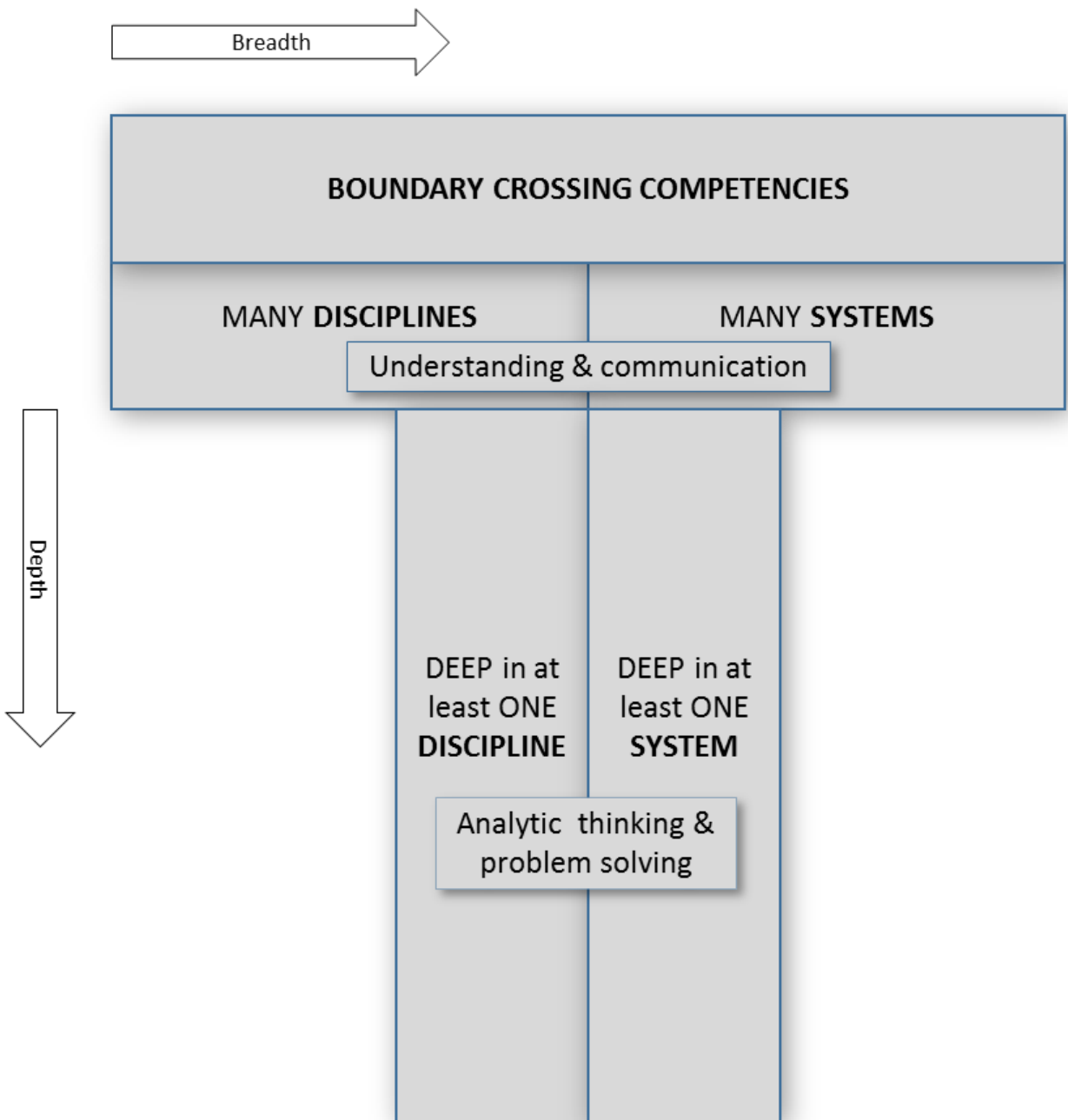
- The T-shaped engineer has at least one system/discipline of expertise
- The T-shaped engineer also has strong broadening knowledge
- Great understanding of several disciplines/systems
- Many competencies of more general character



T: Depth and breadth

The two variables DEPTH and BREADTH are equally important!

- Without the *depth*, the arguments don't hold up...
The boundary crossing competencies become worthless – no credibility without expert knowledge!
- Without the *breadth*, there is no cooperation and understanding



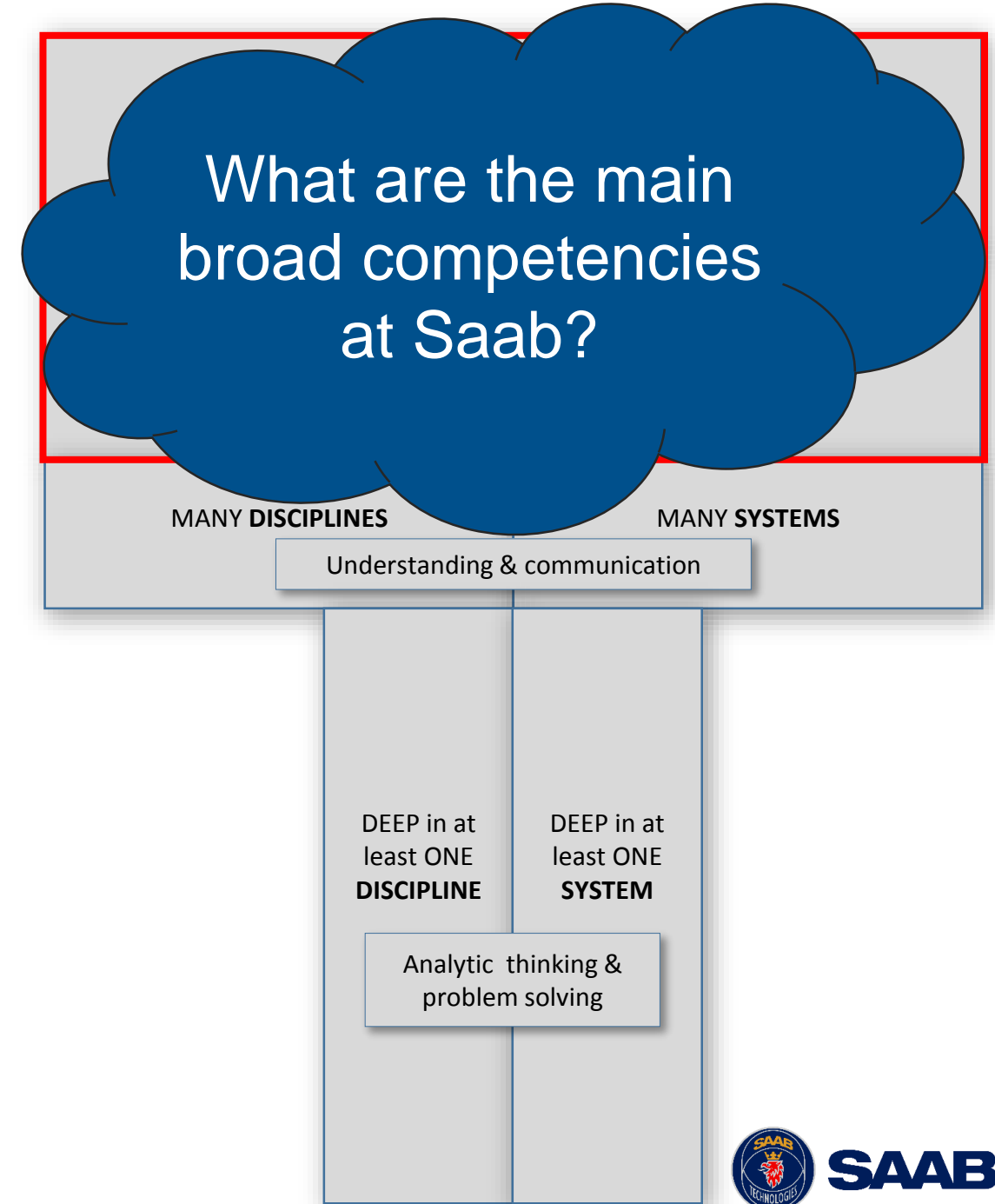
T-shaped technical leaders

Many "heavy" **technical competencies**

- General and cross-boundary nature, only acquired by extensive general technical experiences
- Systems engineering
- Integration
- ...

Personal competencies (equally important!)

- Cooperate
- Work as a bridge builder over the borders
- See the big picture
- ...

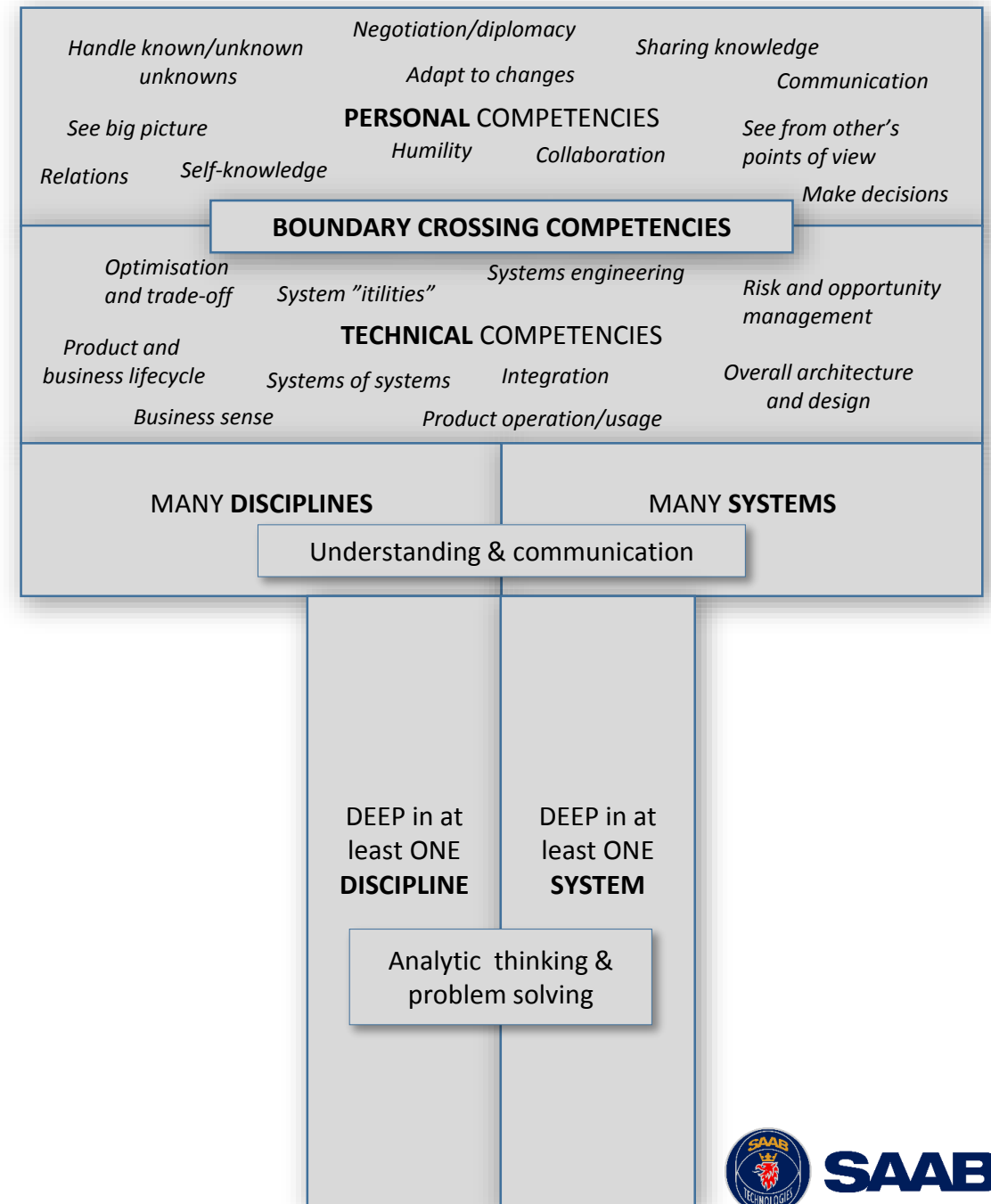


T-shaped technical leaders: our T

How did we reach to the result?

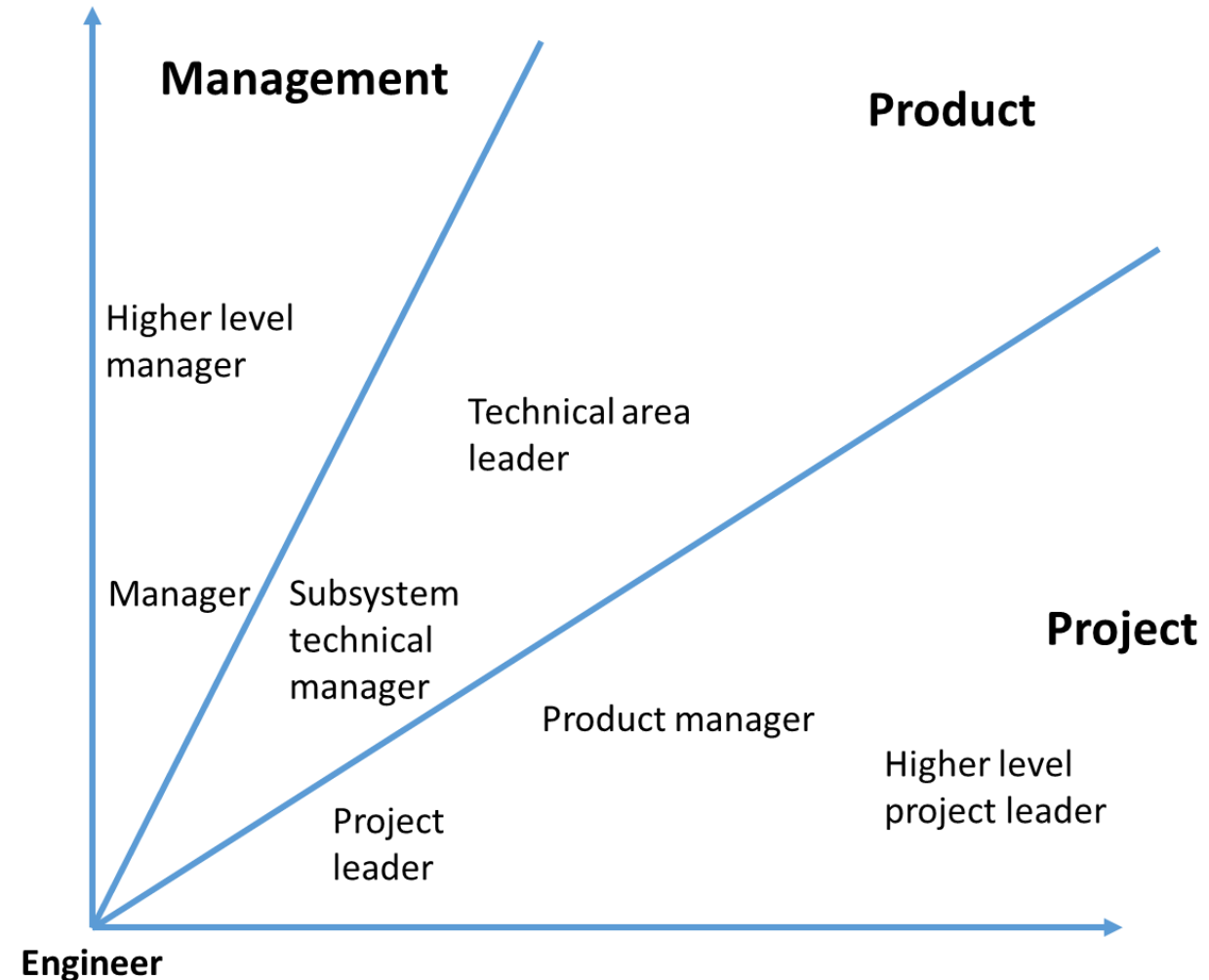
- Publications about knowledge accelerators for senior systems engineers
- Interviews, surveys and discussions with Saab engineers and technical leaders at various levels...

Our T: condensed format from a greater number of properties and competencies...!



Competencies dependent on role

- Broad technical roles – far away from "origin" need broad and general knowledge
- **Depending** on leadership area: **different** technical knowledge
- **Independent** on leadership area: **same** personal knowledge





How to accelerate the creation of T- shaped technical leaders

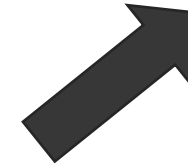
Experiences from
Aeronautics
Advanced
Engineering Training
Program

Aeronautics Advanced Engineering Training Program (AAETP)

Purpose: Prepare engineers for *future leading roles requiring a broad technical competence*

- product manager
- chief engineer/test engineer/systems engineer
- project manager
- systems architect
- concept engineer

The program runs for 2.5 years



Program description

Program goals:

- Broad technical understanding (work rotations)
- Good knowledge about general system development and increased product knowledge
- Good knowledge about the development process and all aspects of the product lifecycle
- Personal maturity

Program content:

- Work rotations
- Mentorship
- Courses, seminars and study visits
- Group tasks



A typical program – who are the participants?

Medium age

42 years

(from 32 to 50 years)

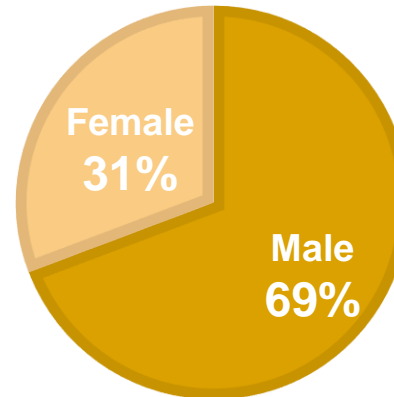


Work life

132 years at Saab
212 years in total

Education

BSc	5
MSc	6
PhD	2



79

Work rotations
(6,1 rotations/person)

Benefits from the program

Personal

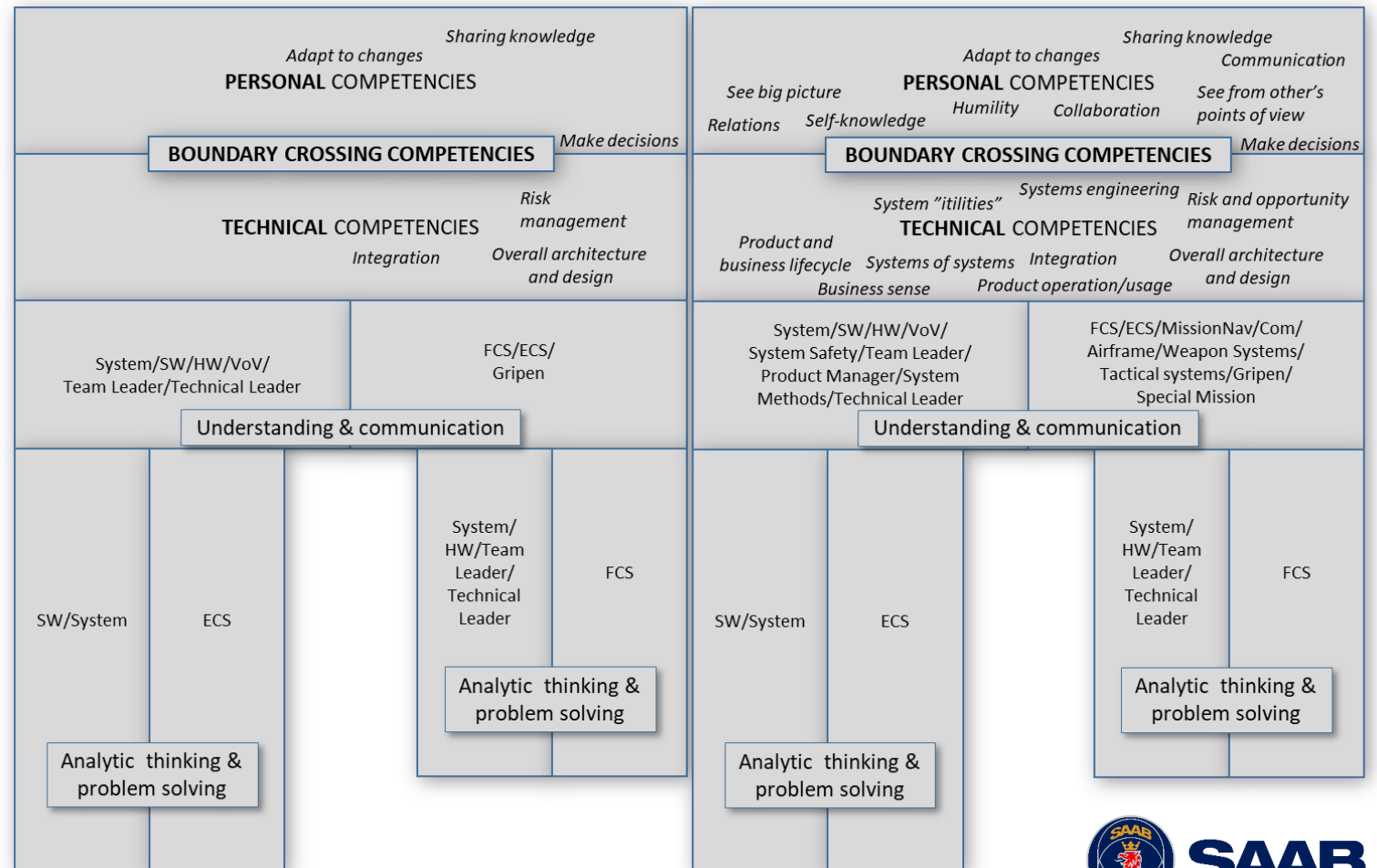
- Personal network
- Self-knowledge
- Training in communication and collaboration
- Possibility to test roles and work tasks normally not reachable
- Broader picture of the system development

Organisational

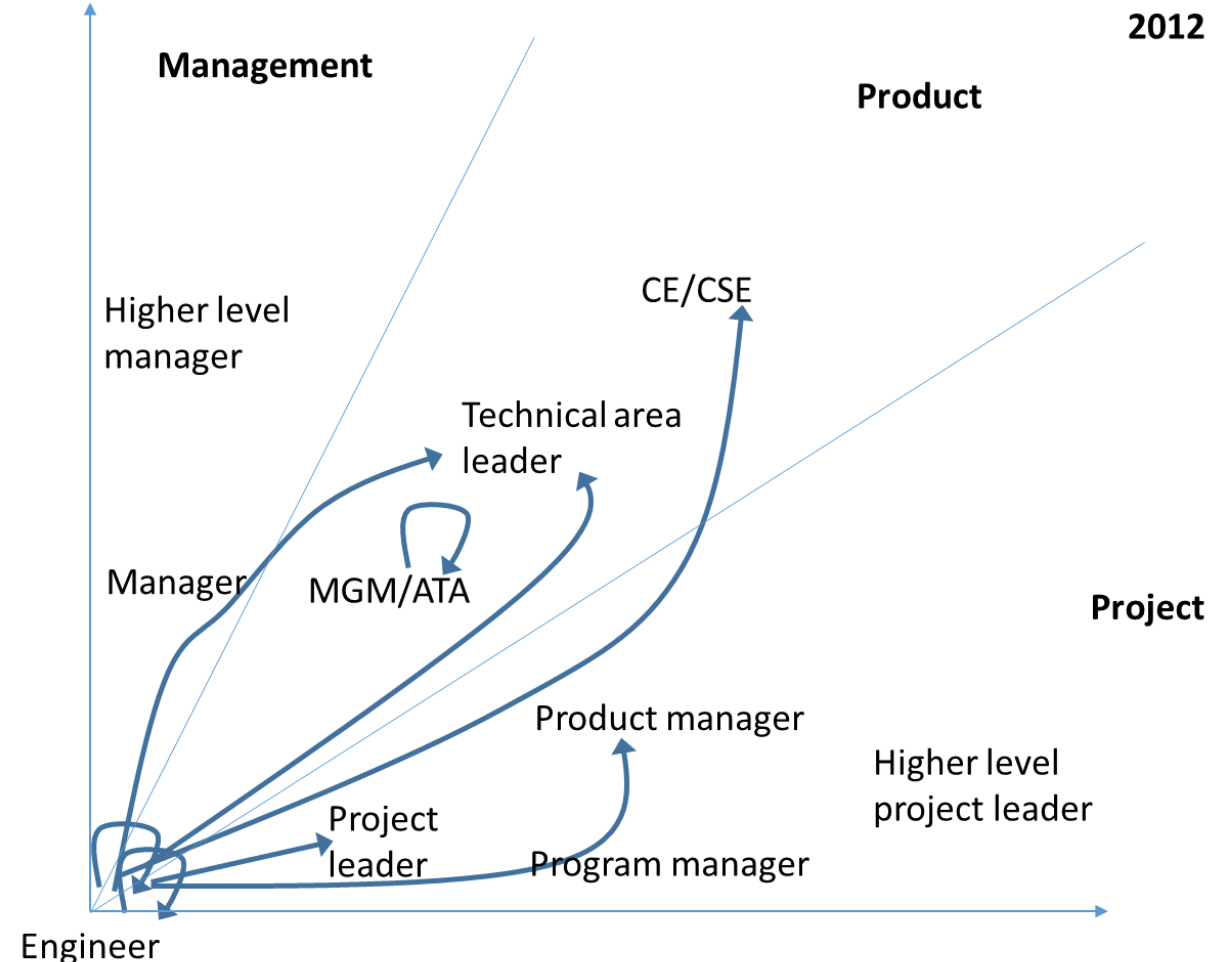
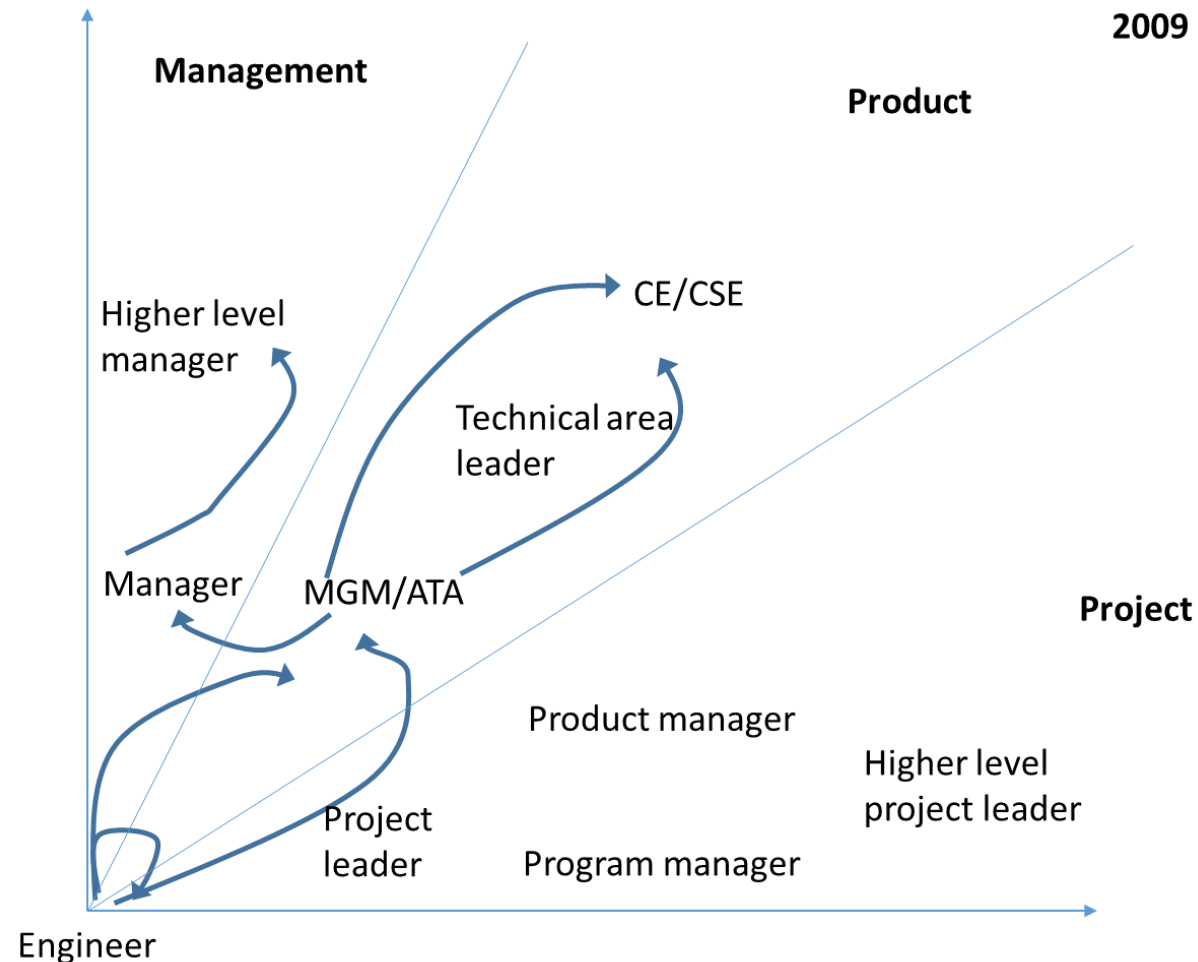
- Participants are valuable observers of the organisation during the program
- Sharing knowledge and encourage collaboration
- The program creates engineers with a strong T-shape, with the possibility to see the big picture

T-competencies before/after program

- The program gives valuable training on the boundary crossing competencies!
- New competencies within both personal and technical competencies
- Note: the images illustrate a trend, they are not to be taken literally 😊



Roles before/after program



Some thoughts about program improvements

- More external input & connection to international “best practice”
- Clarify what competencies needed for heavy technical leadership roles
- Organise a clear program ending





Conclusions and recommendations for future

Conclusions and recommendations

- The T-shaped model is clear and simple when describing breadth and depth of technical leaders
- Saab's AAETP program drastically increases broadening competencies – creates people with a strong T-shape and ability to see the big picture
- There is bigger benefit of the program if you have a clear engineer identity and earlier experience
- The program has potential for further improvements
- The benefits from the program are large – of course the program should continue!





Thank you!
