



**28<sup>th</sup>** Annual **INCOSYMP**  
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# SE Technical Leadership

## **A Model-Based Framework**

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# CONTEXT

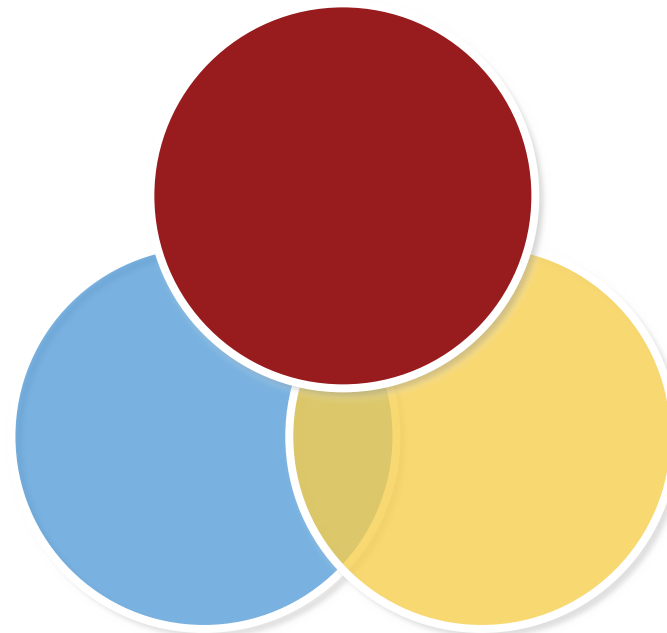
- Reinforce and develop technical leadership and leaders to address SE challenges (complex systems development, implementation and deployment).
- Technical leaders should possess competencies, skills, knowledge and behaviours that enable them to drive the SE effort to a successful conclusion.



# MODEL-BASED SE FRAMEWORK

Cohort 1 Technical  
Leadership Mind-map

Actionable technical leadership  
attributes (Competency  
Framework WG)



How the framework can be  
effectively used/deployed

Introduction of a model-based SE framework

# SCENARIOS OF USE



Project Managers



SE Actors



HR representatives



SE Competency  
Framework Managers



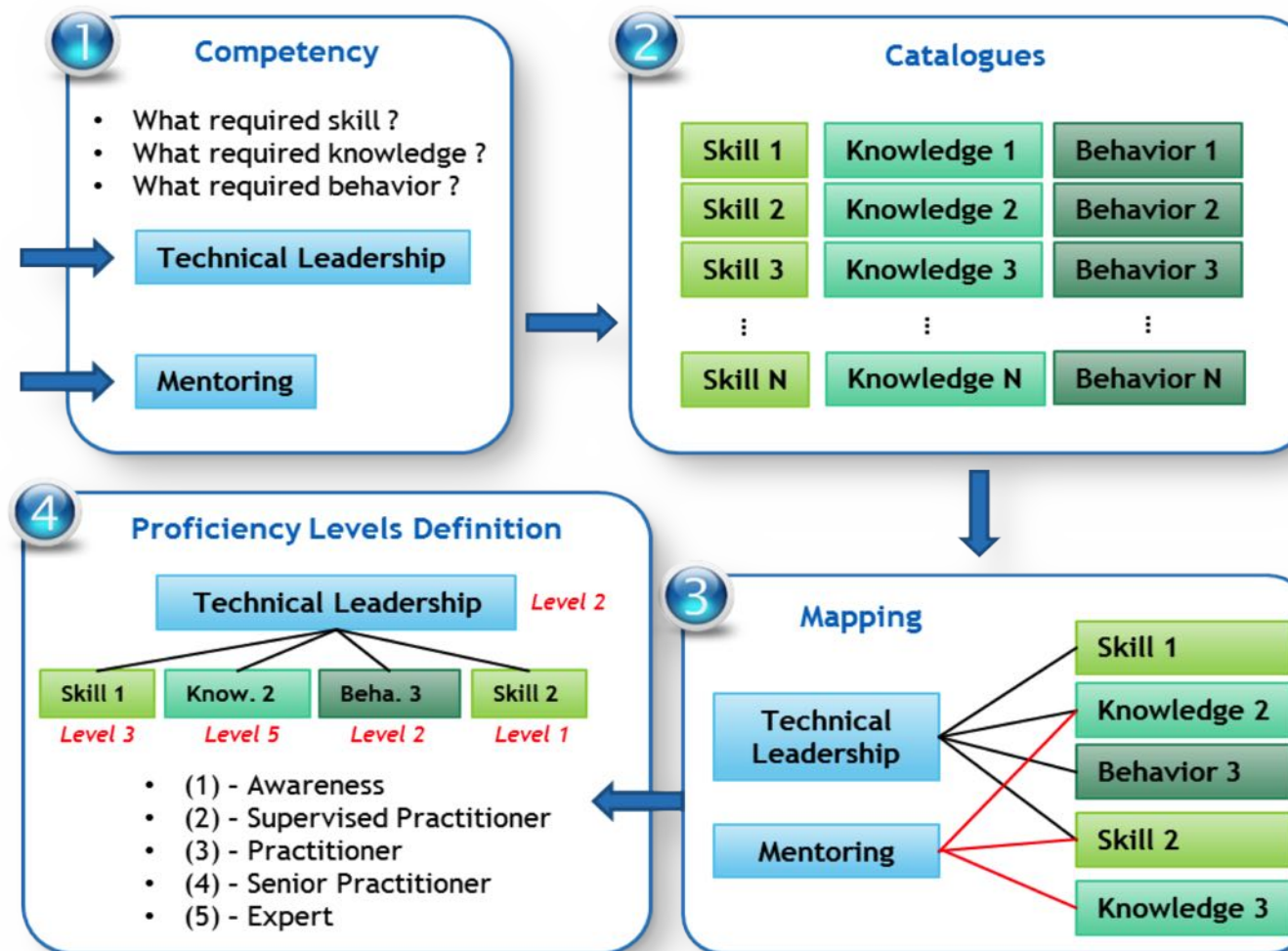
Establish and manage a SE  
competencies catalogue

Configure the required competencies  
for a defined SE role, generate and  
publish SE positions

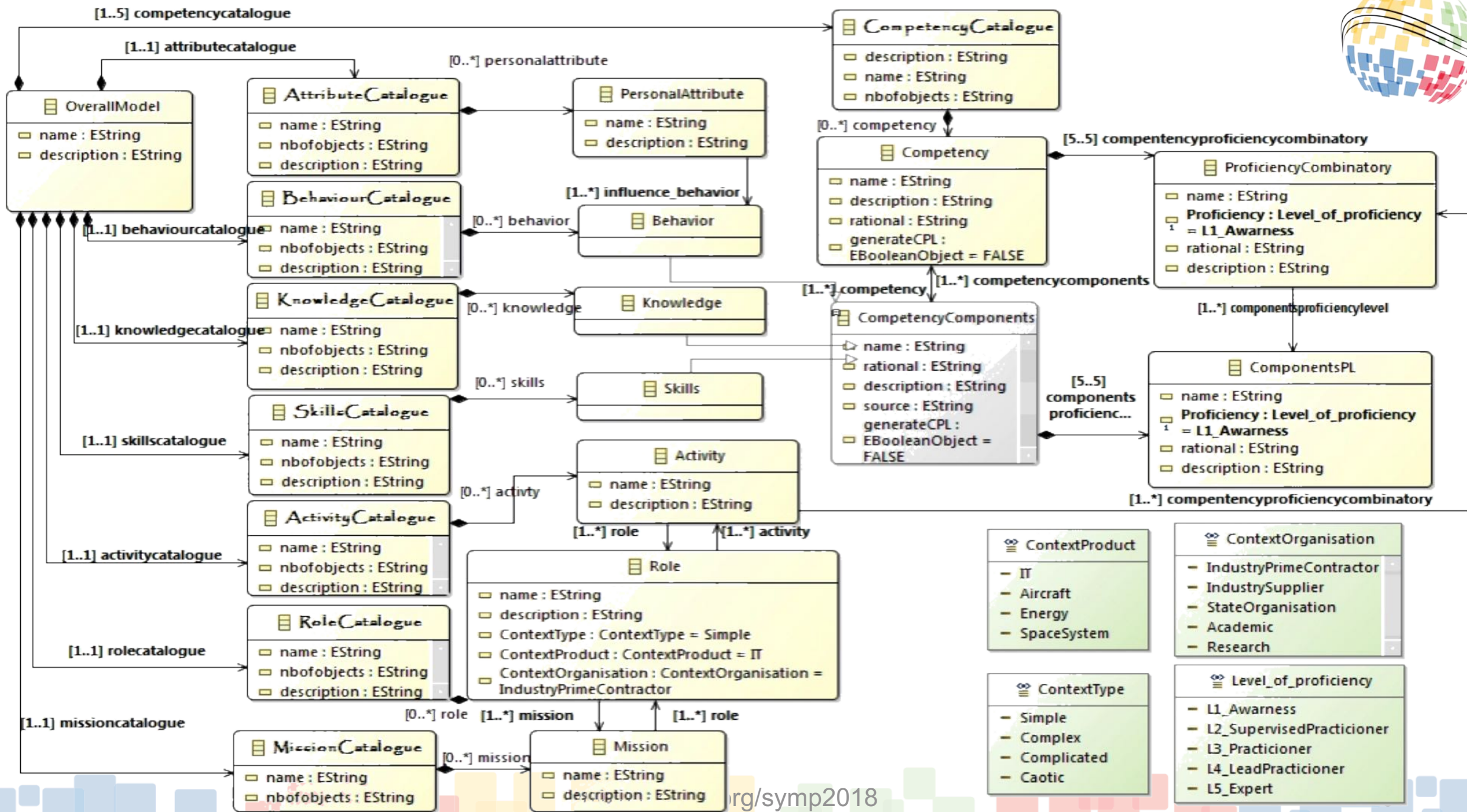
Identify strengths or weaknesses,  
360° assessments, derive the needs  
for development, training

Decide on the appropriate team to  
setup, define project organization,  
identify possible skills gaps

# Principles of Competency Proficiency Levels Combinatory









EFFECTIVE INDICATORS OF KNOWLEDGE AND EXPERIENCE				
AWARENESS	SUPERVISED PRACTITIONER	PRACTITIONER	LEADING PRACTITIONER	EXPERT
Understands the need to create relationships	Able to create relationships	Able to create and maintain relationships by meeting & interacting with other people	Able to address conflicts pro-actively. Listen, understand and solve problems (questioning, interview skills)	Ability to persuade / convince others, able to negotiate or reach consensus.
Understands the need for collaboration, team spirit and cooperation	Acts as team player when supervised	Able to collaborate in teams and cooperate. Understands main principles and remains at this level of details. Master presentation and writing skills	Understand main principles as well as composing details to reach a full picture. Meet & interact with other people effectively. Designing, planning & Running Productive Meetings	Ability to explain / teach complexity, able to train others (practicing, coaching). Others advanced specific skills (emails, phone, twitter, social medias, articles, web_sites, publications, books, lecturers, teaching, commercial exchange, blog, contracts, meeting notes, press release...)
Understands the need for finding appropriate communication channels	Able to interact with others	Ability to express own opinion	Adopt an extrovert behaviour, including non-verbal communication and effective speaking	Ability to anticipate and manage possible forthcoming issues (communications planning & strategy)
Understands the need for trust and transparency	Able to develop trust and transparency	Able to create a communicating culture by finding appropriate language.	Able to conduct interviews, to reconstitute correctly information that has been captured	Ability to transmit information to non-sensitized individuals. Adapt speech to audience as necessary, adopting the correct meaning. Personal skills (self-esteem, confidence, charisma, share energy...)
	Understands the need for clarity to avoid misunderstanding	Understands the need for feedback. Performs active listening	Ability to reformulate or express ideas clearly / in a way or language they can be understood (including presentation skills)	Ability to develop a learning / listening atmosphere, adding possibly a sense of humour.
		Able to augment clarity to avoid misunderstandings	Able to provide direct feedback	Able to provide constructive feedback seeking for improvement / communicating in difficult situations
				Able to provide strategic guidance, explaining vision. Able to set objectives to him/herself & others.

## Example of Competency WG catalogue for Communication competency

runtime-New\_configuration - Resource - SE\_Competency\_Framework-Instance\_TLI/My.emma\_tli - Eclipse Platform

File Edit Navigate Search Project Emma\_tli Editor Run Window Help

Project Explorer

- emma\_tli.design
- SE\_Competency
- Project Dependencies
- My.emma\_tli
- Overall
- Behaviour Catalogue
- Knowledge Catalogue
- Skills Catalogue
- Competency Catalogue Core Systems Engineering Principles
- Competency Catalogue Professional Competencies
- Competency Communications
- Proficiency Combinatory Competency - Communications - L1\_Awareness

By clicking on **Communication Proficiency Level 1** (*upper right frame*) and in its property table (*lower right frame*), then a pop-up table of overall proficiency levels of skills, behaviors & knowledges is opened from a pre-defined catalogue:

Searching for “**Trust**” (as part of the skills catalogue) the tool can retrieve the corresponding entry and propose the five available proficiency levels (*right frame*):

Componentsproficiencylevel -- Proficiency Combinatory Competency - Communications - L1\_Awareness

Filter Available Choices

Choice Pattern (\* or ?) tr

Choices

- Components PL Skills - Trust - L1\_Awareness
- Components PL Skills - Trust - L2\_SupervisedPractitioner
- Components PL Skills - Trust - L3\_Practitioner
- Components PL Skills - Trust - L4\_LeadPractitioner
- Components PL Skills - Trust - L5\_Expert

Feature

- Components PL Skills - Good relationship - L1\_Awareness
- Components PL Behavior - Collaborative - L1\_Awareness
- Components PL Skills - Team Spirit - L1\_Awareness
- Components PL Skills - Interpersonal communication: between colleagues, with hierarchical level(s), fr

Selection Parent List Tree

Properties

Property

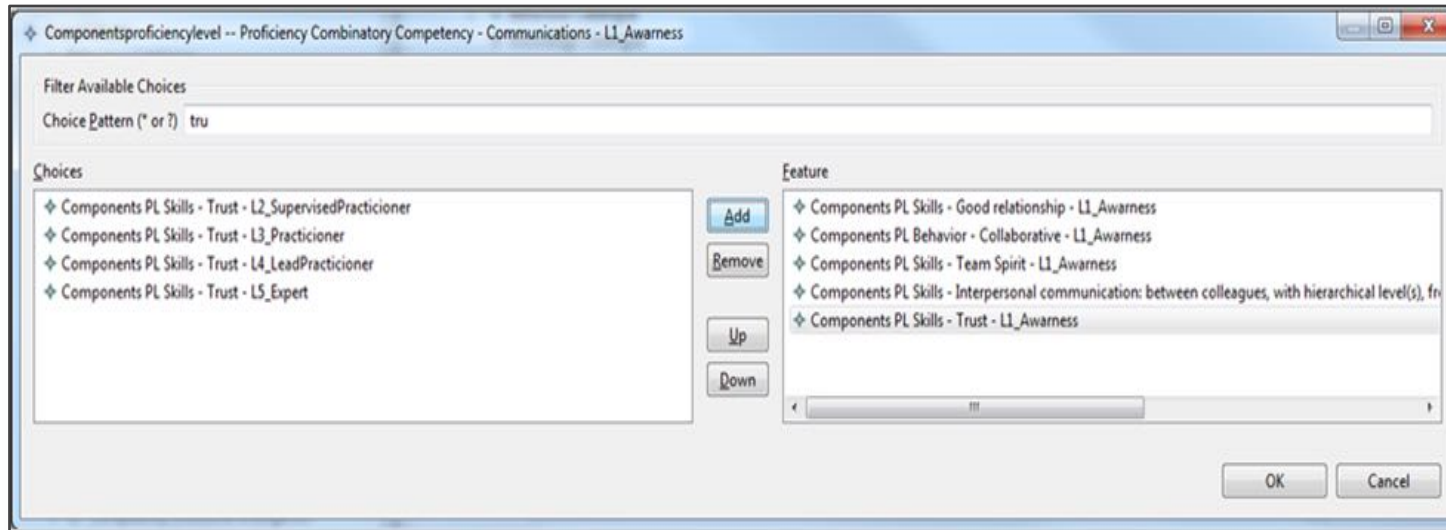
- Componentsproficiencylevel
- Description
- Name
- Proficiency
- Rational

OK Cancel

## Communication competency instantiation in the SE framework



## Selection & addition of the **Trust Proficiency Level 1** (corresponding to communication competency / proficiency level 1)



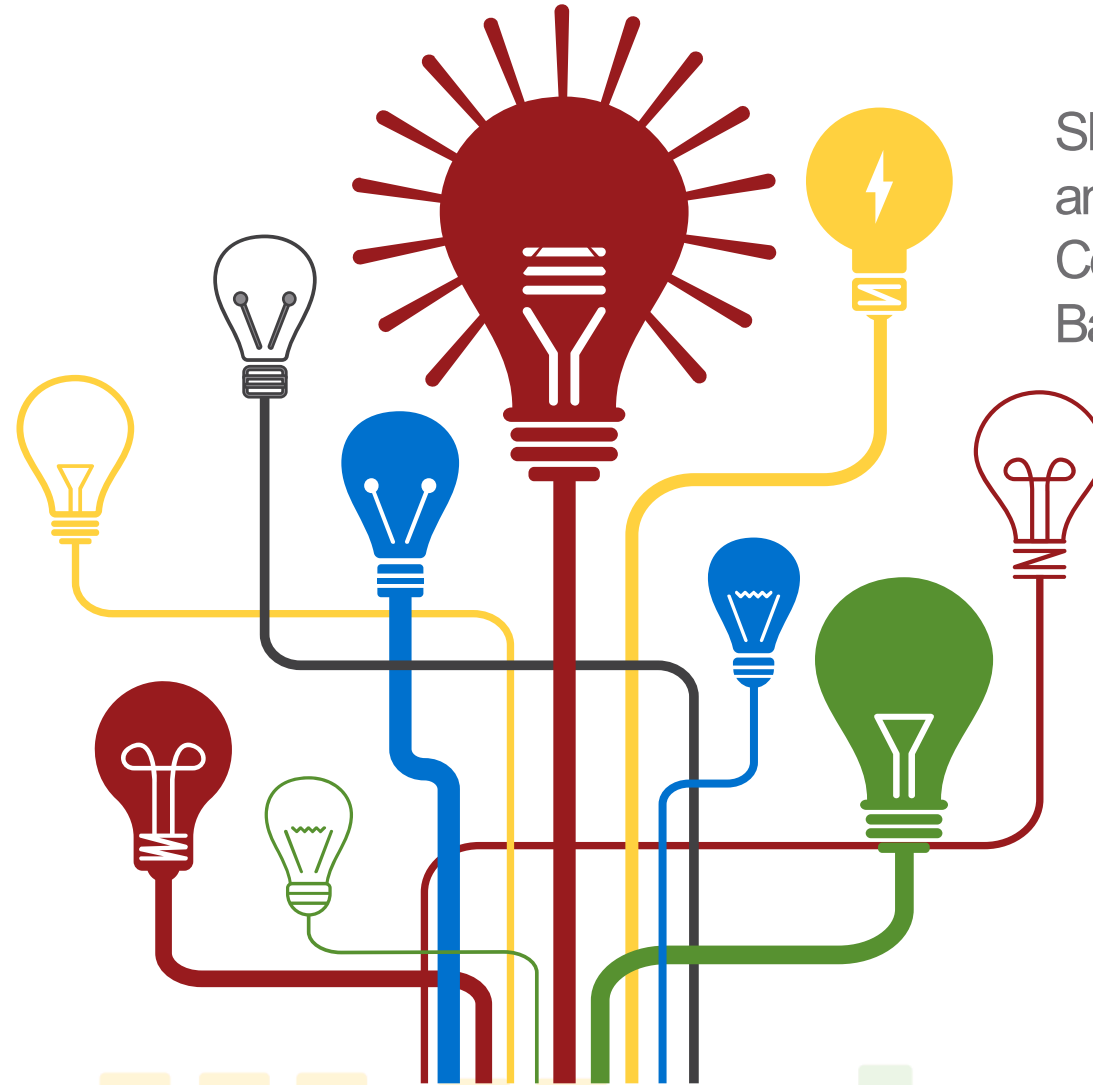
Communication Proficiency Level 1 includes the “*Ability to develop trust and transparency*”, the “*transparency*” skill is required BUT:

- it is missing from the skills/behaviors catalogues (to be added)
- another catalogue item should be selected instead =>the description of the Communication Proficiency Level 1 shall be updated



# CONCLUSION

The data-model can be used as ground foundation for any competency catalogue management whatever means is used to do so.



SE community can share an overall SE Competency Model-Based Framework.

It is a more efficient and reliable tool than traditional office tools, in order to be able to manage competencies properly.



# WAY FORWARD



Finalization of the implementation of the overall SE competency framework

Completion of the model's validation by analysing other use cases / scenarios.

Enrichment of the skills, behaviours and knowledges catalogues.

Association between each catalogue's element and improvement suggestions for skills, behaviors or knowledges.

Update the data-model to be enable implementation in several more scenarios.



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