



**34<sup>th</sup>** Annual **INCOSE**  
international symposium

hybrid event

Dublin, Ireland  
July 2 - 6, 2024



Dr. Nicole Hutchison

# Embrace Yourself

## Our Responsibilities and Competencies as Complex Problem Solvers



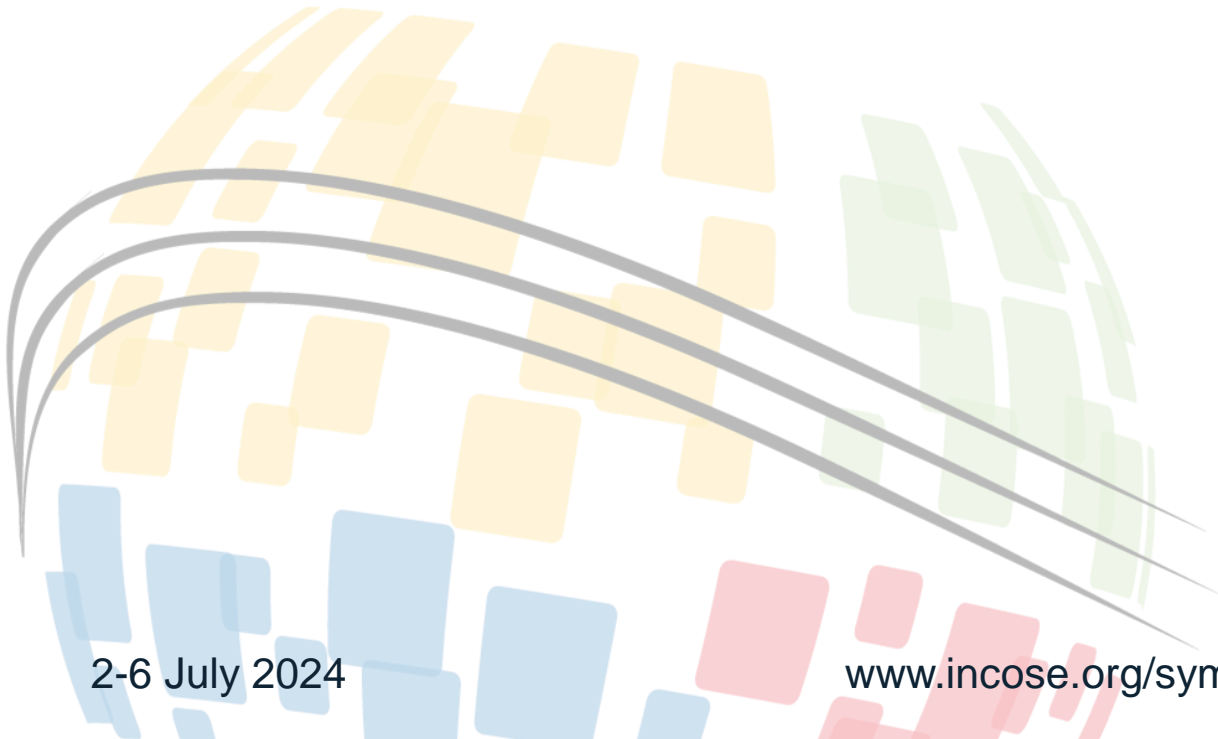


2-6 July 2024

[www.incose.org/symp2024](http://www.incose.org/symp2024) #INCLOSEIS



# SERC - placeholder



2-6 July 2024

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# Who are (systems) engineers?

## General Perspective

People who  
are really  
smart

People who  
like puzzles

People who

People who

Nerds

Poor social  
skills



# Who are systems engineers?



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2-6 July 2024

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# Systems Engineers are people who ...





# Systems engineering is ...



Photo from: <https://www.slatervecchio.com/blog/8-reasons-why-kids-should-play-contact-sports/> (also worth the read)

# Top Trumps

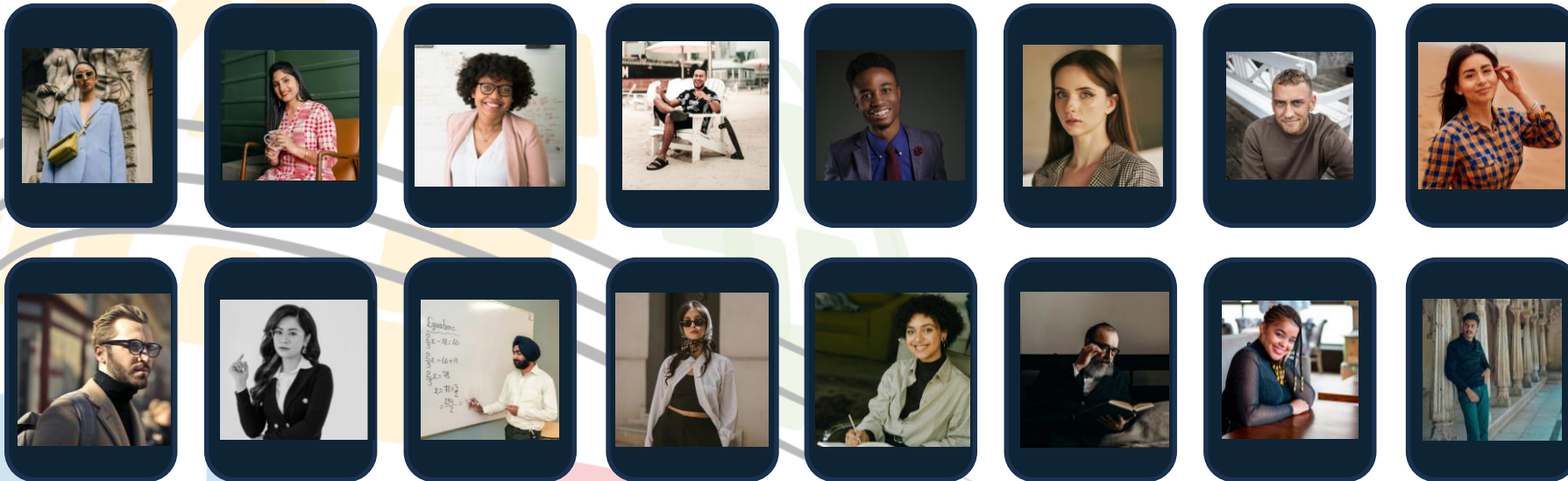


- Cards representing different options
- 3-4 critical characteristics
- Object: select the category with the highest score (not knowing what your opponents have)



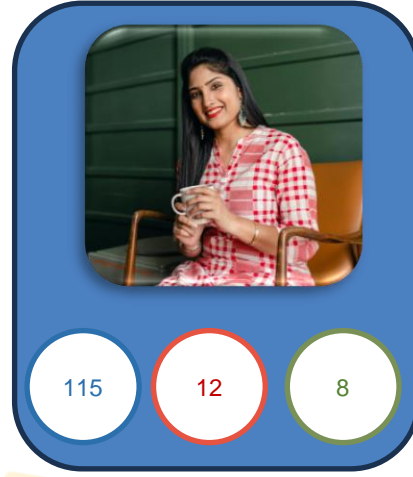
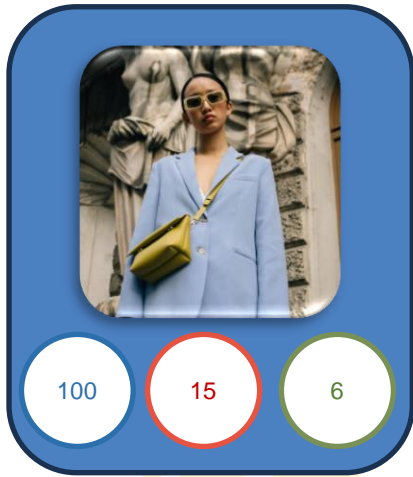
# Your Teams

- Who selects systems engineers for your teams?
- How well do they understand what values systems engineers bring?
- How well do they understand what makes a good systems engineer?



Candidate  
pool for your  
team

# Team Selection Using Generic Understanding



IQ

Raw intelligence (Std IQ)

DOM

Domain Expertise (0-20)

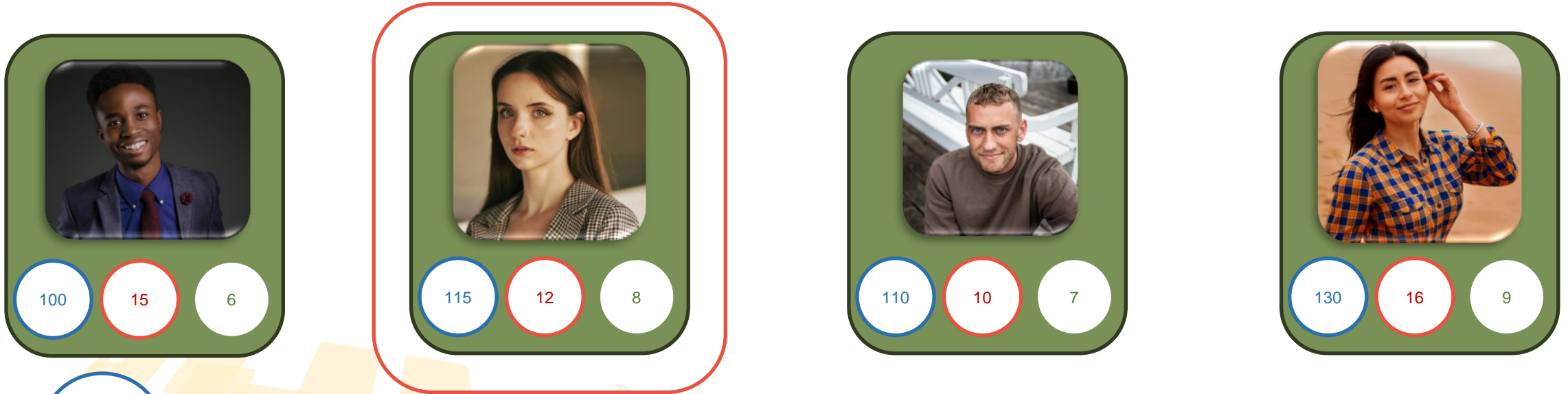
ENG

Engineering Skill (0-10)

Role: Systems Architect



# Team Selection Using Generic Understanding



IQ

Raw intelligence (Std IQ)

DOM

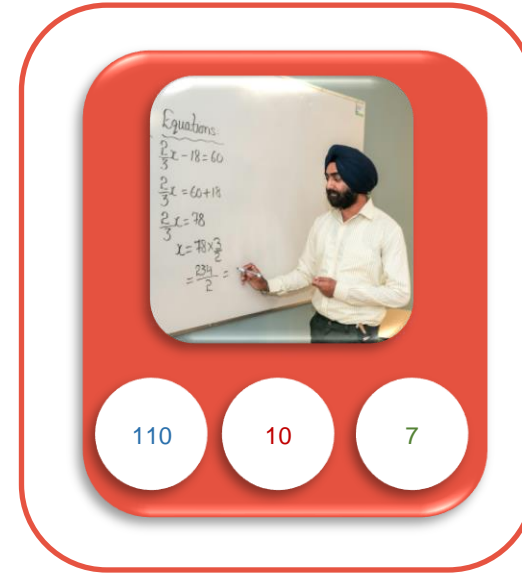
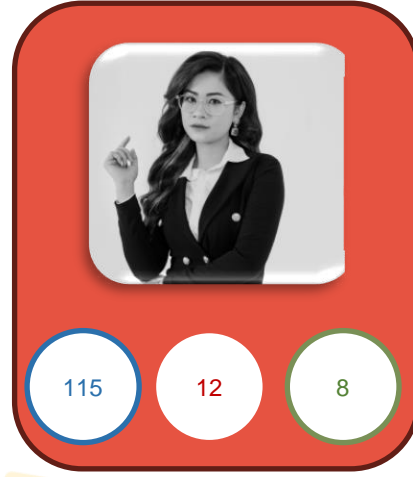
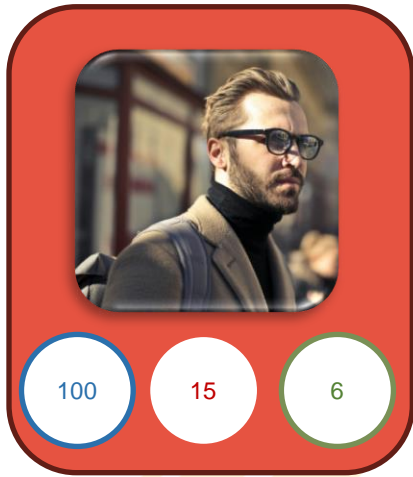
Domain Expertise (0-20)

ENG

Engineering Skill (0-10)

Role: Stakeholder and  
Requirements Manager

# Team Selection Using Generic Understanding



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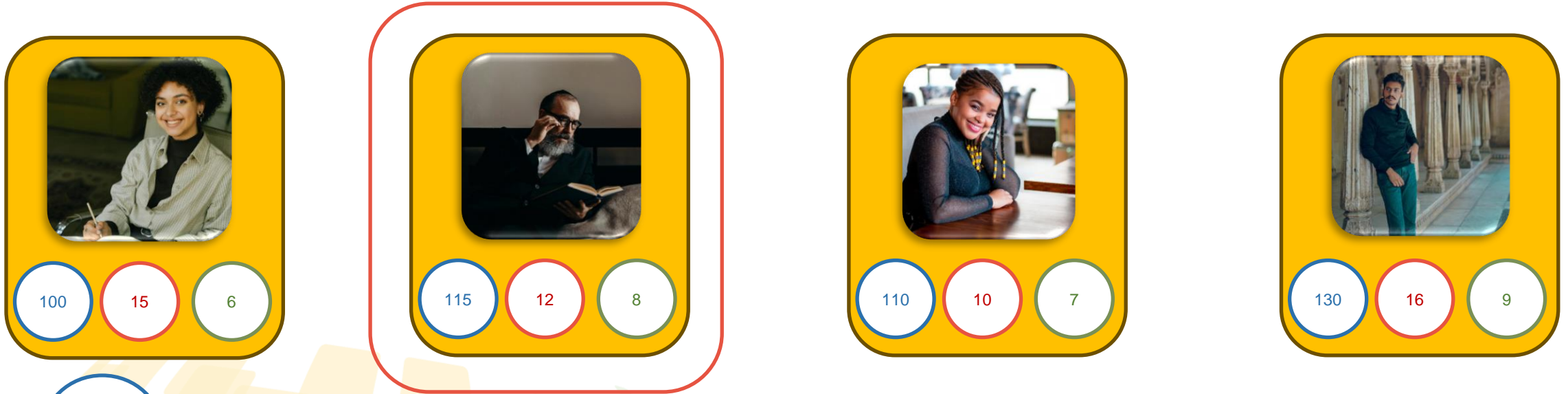
ENG

Engineering Skill (0-10)

Role: Systems Modeler



# Team Selection Using Generic Understanding



IQ

Raw intelligence (Std IQ)

DOM

Domain Expertise (0-20)

ENG

Engineering Skill (0-10)

Role: Chief Systems Engineer

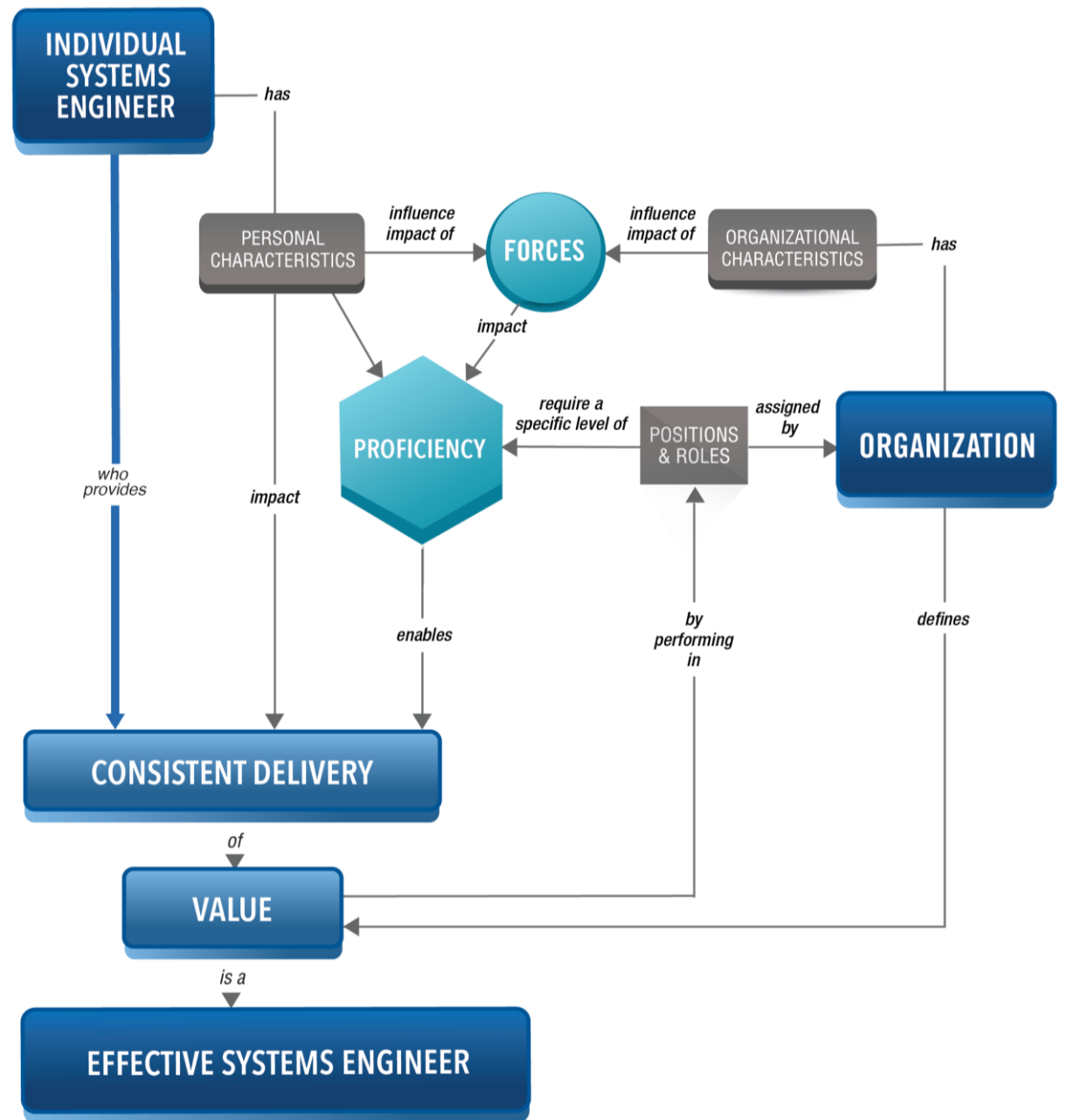
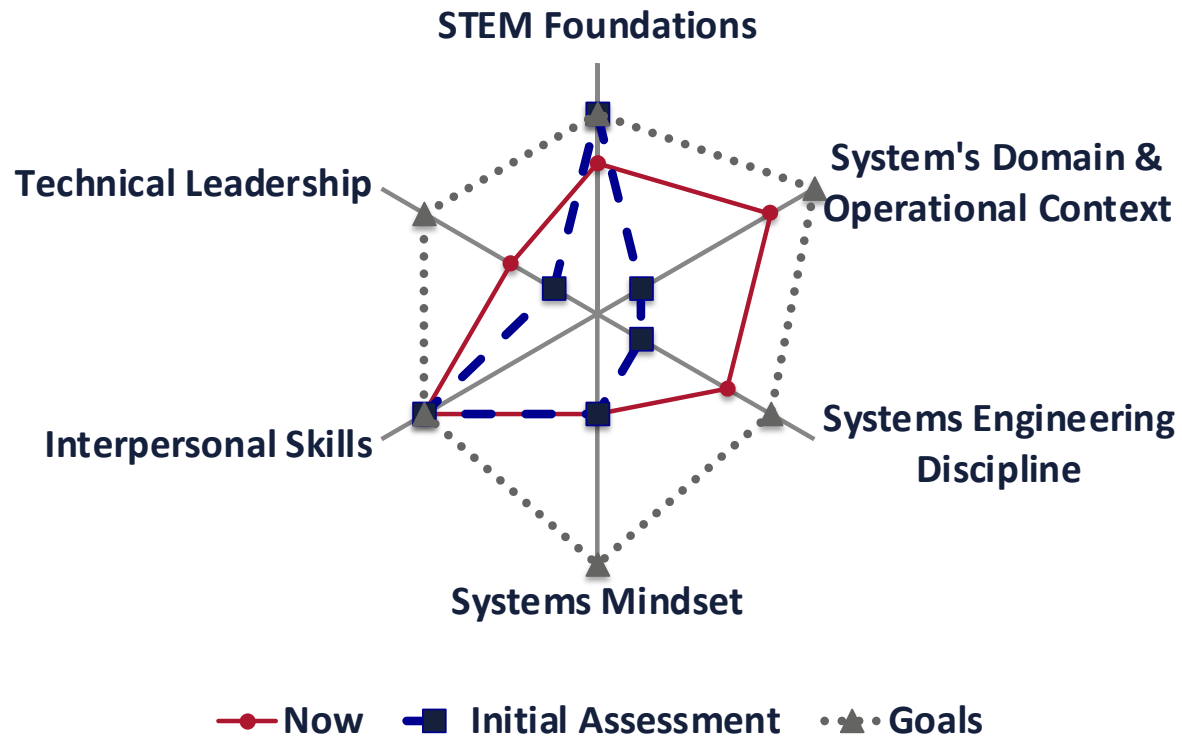
# How do you feel they will perform?



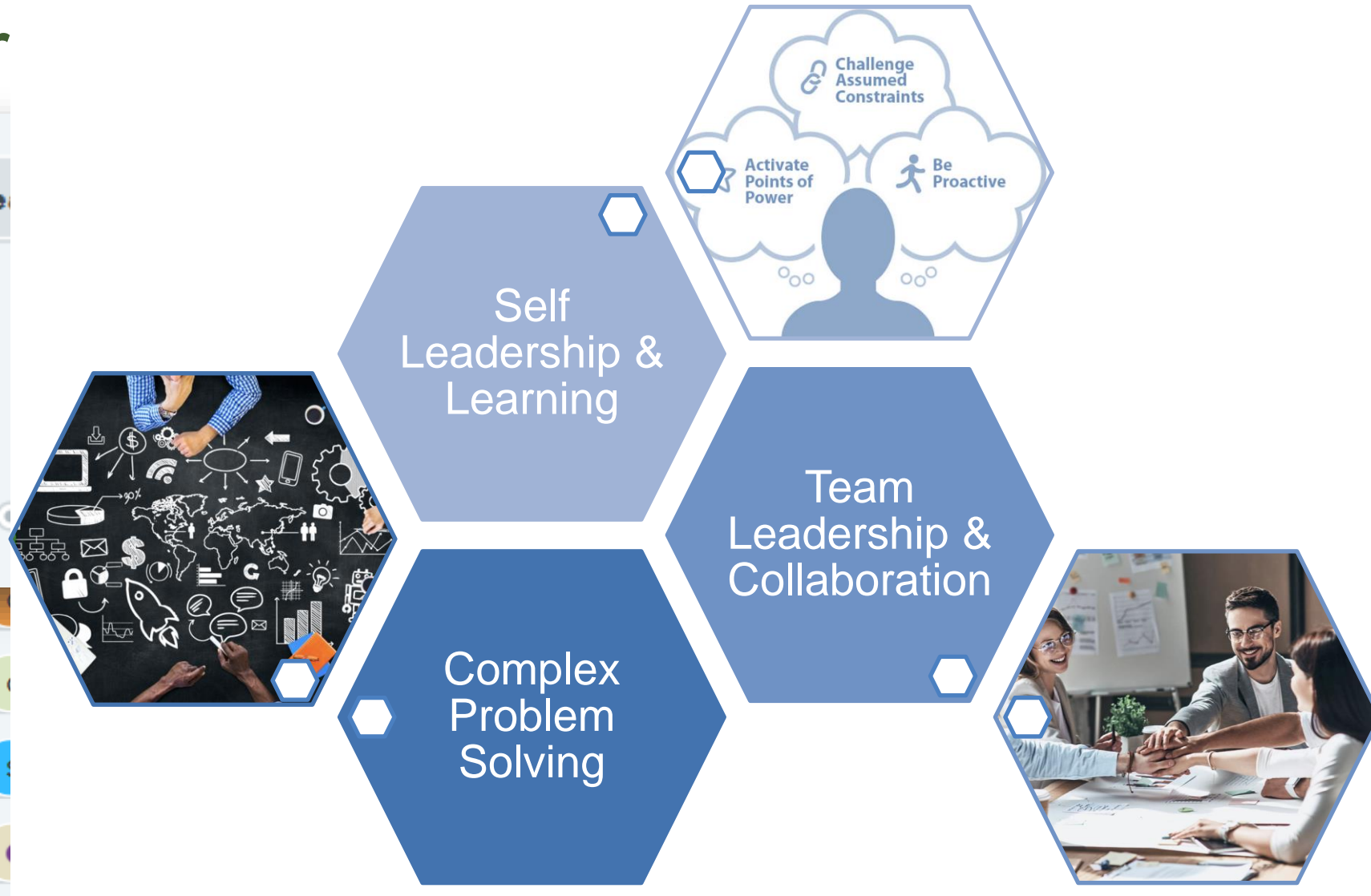
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# Helix<sup>SE</sup>



# How can we gener





# Motivation

## World Economic Forum Top 10 Skills Survey Results

Most In-Demand Skills of 2015	Most In-Demand Skills of 2020	Most In-Demand Skills of 2025
1. Complex Problem Solving	1. Complex Problem Solving	1. Analytical Thinking & Innovation
2. Coordination with Others	2. Critical Thinking	2. Active Learning & Learning Strategies
3. People Management	3. Creativity	3. Complex Problem Solving
4. Critical Thinking	4. People Management	4. Critical Thinking & Analysis
5. Negotiation	5. Coordination with Others	5. Creativity, Originality & Initiative
6. Quality Control	6. Emotional Intelligence	6. Leadership & Social Influence
7. Service Orientation	7. Judgment & Decision Making	7. Technology Use, Monitoring & Control
8. Judgment & Decision Making	8. Service Orientation	8. Technology Design & Prototyping
9. Active Listening	9. Negotiation	9. Resilience, Stress tolerance, Flexibility
10. Creativity	10. Cognitive Flexibility	10. Reasoning, Problem-solving, Ideation

**complex  
problem solving  
capabilities**

**team leadership  
& collaborative  
learning  
capabilities**

**self leadership &  
learning  
capabilities**

**Foundations**

# Which of these are most important?

- Employability Foundations
- Self Leadership & Learning
- Team Leadership & Collaboration
- Complex Problem Solving



# Your Team

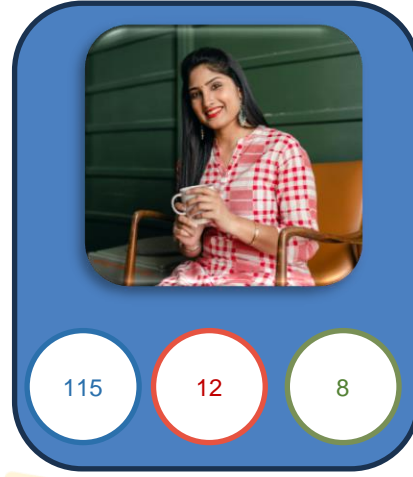
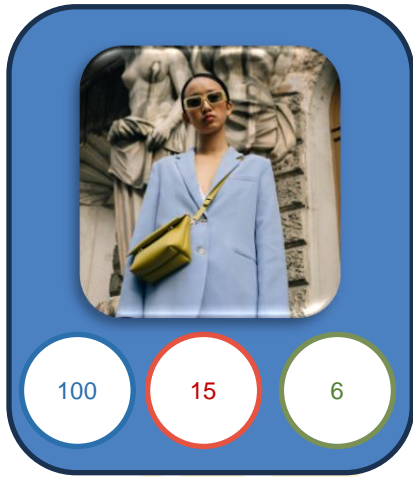
- With the Employability Skills in mind, who will you choose?



Candidate  
pool for your  
team



# Team Selection Using Employability Skills



SLL

Self-Leadership & Learning (0-10)

Role: Systems Architect

TLC

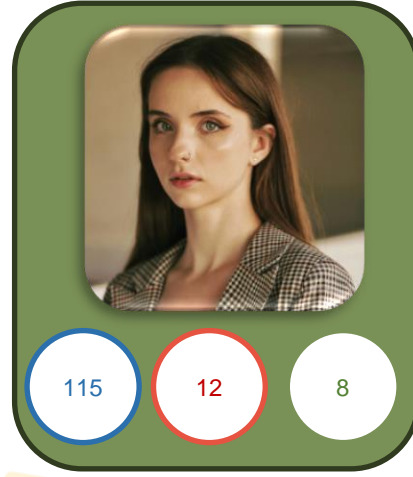
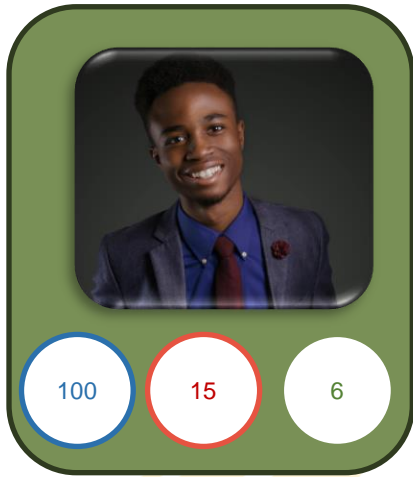
Team Leadership & Collaboration (0-10)

CPS

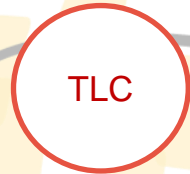
Complex Problem Solving (0-10)



# Team Selection Using Employability Skills



Self-Leadership & Learning (0-10)

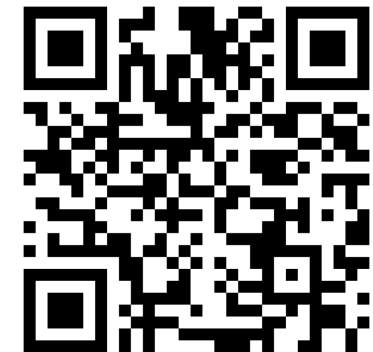


Team Leadership & Collaboration (0-10)




Complex Problem Solving (0-10)


Role: Stakeholder and Requirements Manager




# Team Selection Using Employability Skills




100 15 6



115 12 8



110 10 7



130 16 9

Role: Systems  
Modeler



SLL

Self-Leadership & Learning (0-10)

TLC

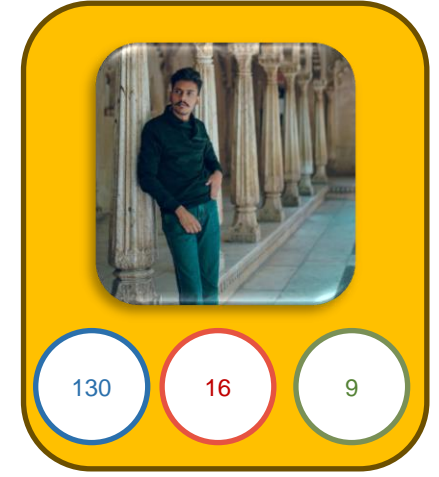
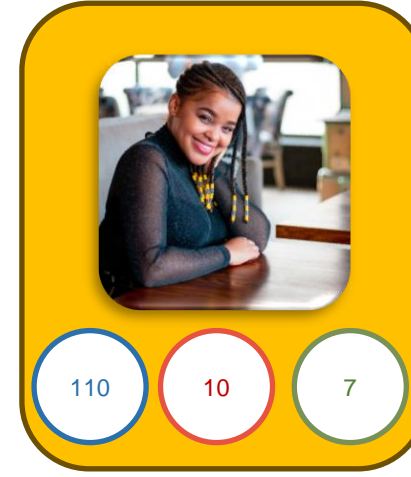
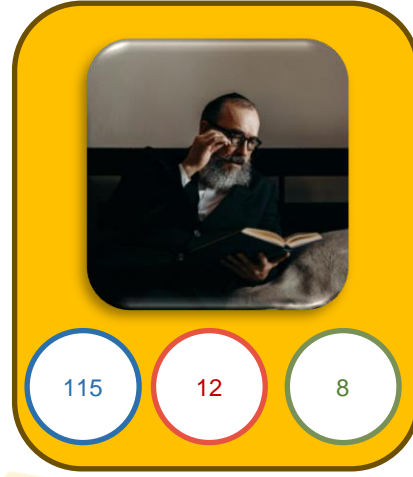
Team Leadership & Collaboration (0-10)

CPS

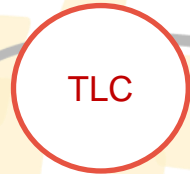
Complex Problem Solving (0-10)



# Team Selection Using Employability Skills



Self-Leadership & Learning (0-10)

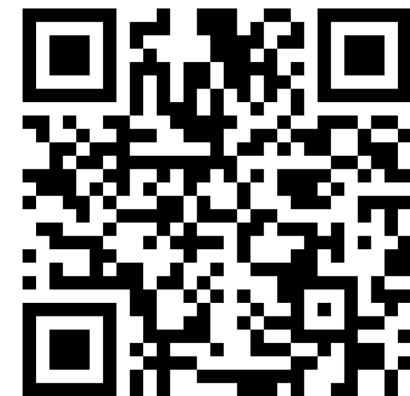


Team Leadership & Collaboration (0-10)

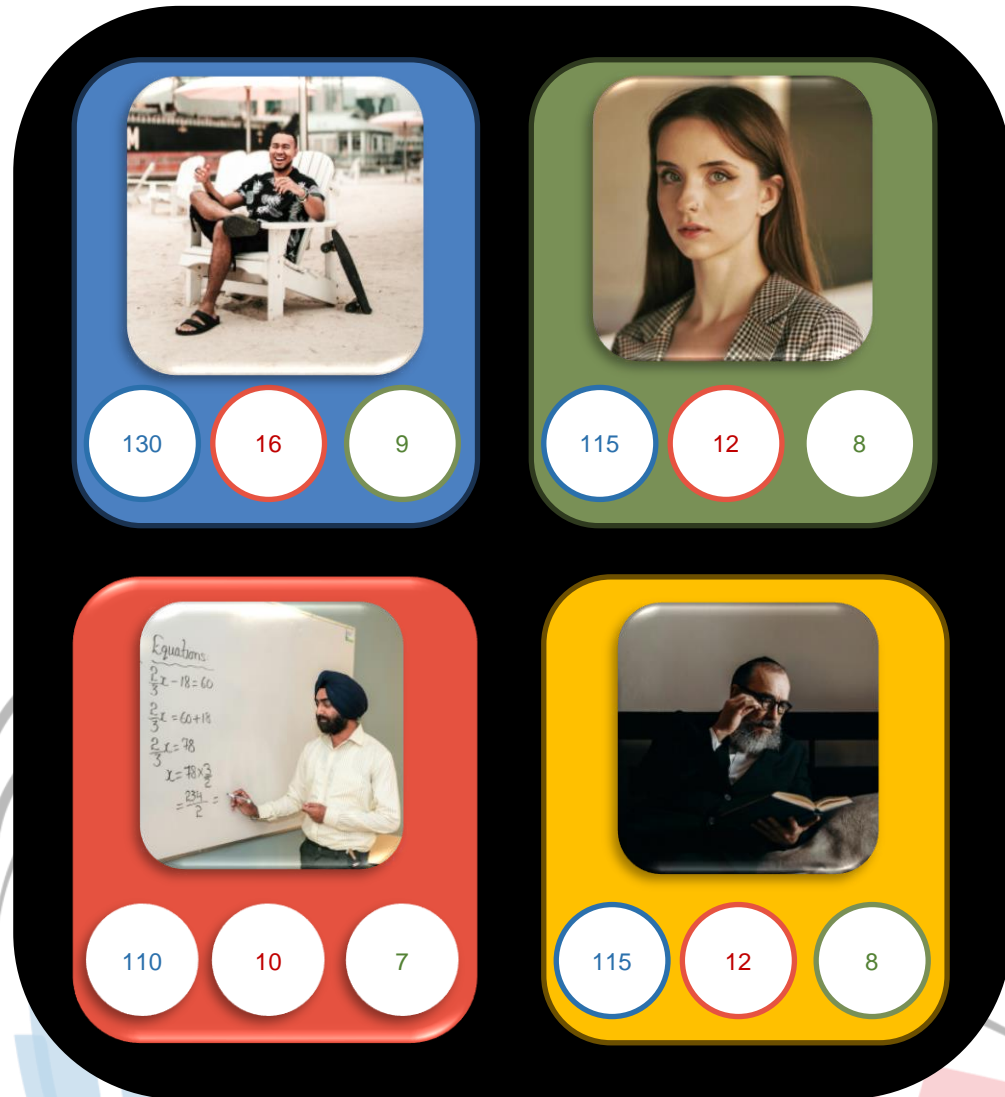


Complex Problem Solving (0-10)

Role: Chief Systems Engineer



# How did the team evolve?





## URQUHART CASTLE



APPROX. DATE OF OLDEST PART	c. 1230
STRENGTH OF DEFENCES	87
ROYAL CONNECTIONS	20
STYLE AND DÉCOR	33
TOP TRUMPS RATING	71



### TOP TRUMPS QUIZ FACT FILE



With views over Loch Ness, Urquhart Castle occupies one of the most romantic settings in the Highlands, but its damaged walls bear witness to centuries of bloodshed. Begun around 1230, possibly on the site of a Pictish fort, it was strategically important throughout its active life, and was in active use until its gatehouse was blown up in 1692.

## EDINBURGH CASTLE



APPROX. DATE OF OLDEST PART	c. 1130
STRENGTH OF DEFENCES	90
ROYAL CONNECTIONS	90
STYLE AND DÉCOR	90
TOP TRUMPS RATING	85

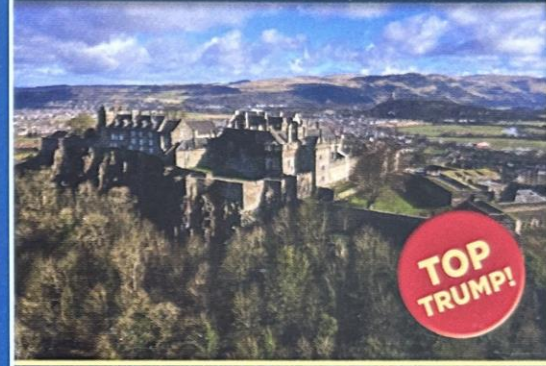


### TOP TRUMPS QUIZ FACT FILE



A fortress has stood on Castle Rock at least since Iron Age times, taking advantage of its natural defences. The castle was a home for Scottish royalty, a vital stronghold, more besieged than any other in Britain, and a major military base. It remains one of the most important places in Scotland's history, at the heart of a World Heritage Site.

## STIRLING CASTLE



APPROX. DATE OF OLDEST PART	1381
STRENGTH OF DEFENCES	85
ROYAL CONNECTIONS	95
STYLE AND DÉCOR	95
TOP TRUMPS RATING	88



### TOP TRUMPS QUIZ FACT FILE



Stirling Castle's dramatic craggy location made it easy to defend, and there was probably an ancient fortress here. It became a royal residence in the early 1100s, and for 500 years was a major royal castle, and a strategically important fortress. A splendid Renaissance palace was added by James V in the 1530s for his new bride Mary of Guise.



# Why is this important?



# A word of caution . . .



# Think about ...

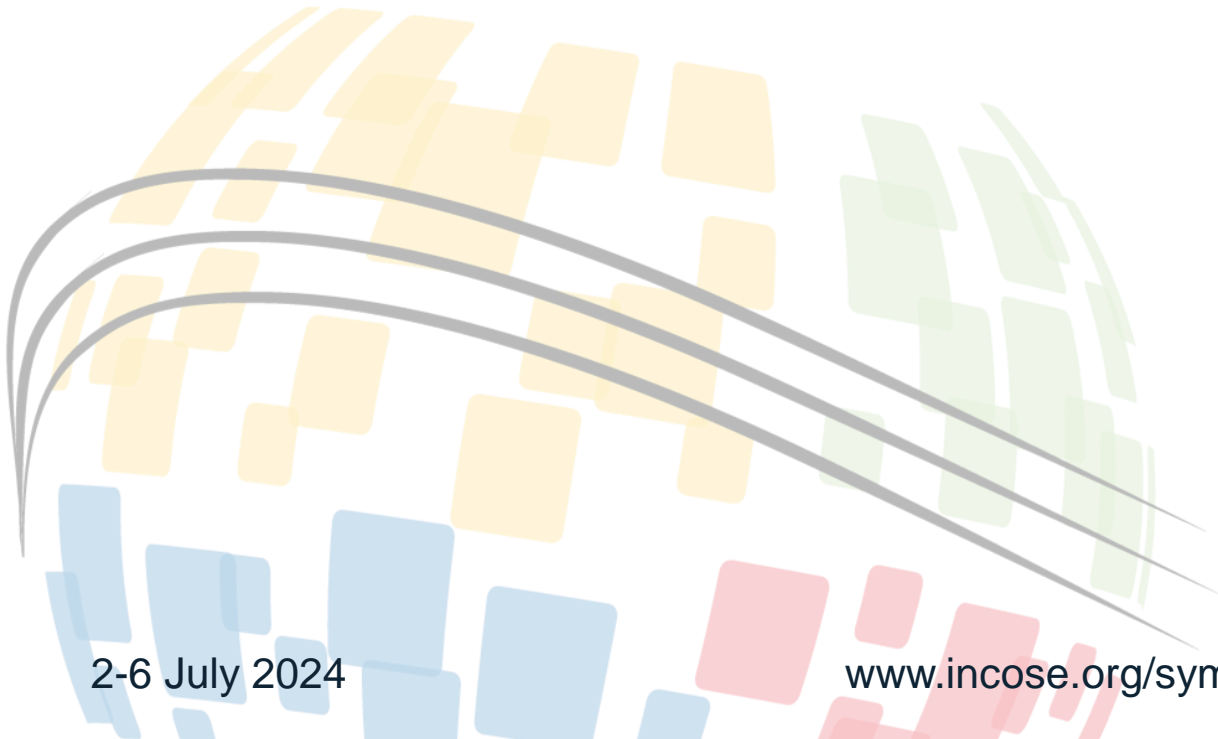
How would you  
explain what we  
do to a  
kindergartener?


How would you  
explain what we  
do to your  
grandmother?

How would you  
explain the value  
we bring without  
using the words  
“systems” or  
“engineering”?



# SE Fundamentals Thoughts in Plain Language





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