



34th 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 #INCOSEIS

SERC - placeholder



2-6 July 2024

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Who are (systems) engineers?

General Perspective

People who
are really
smart

People who
like puzz

People who

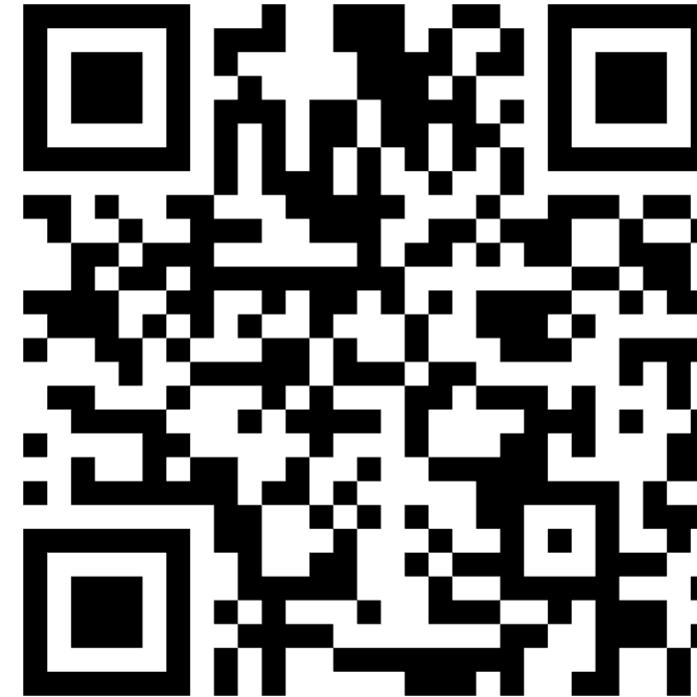
People who

Nerds

Poor so
skills



Who are systems engineers?



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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)

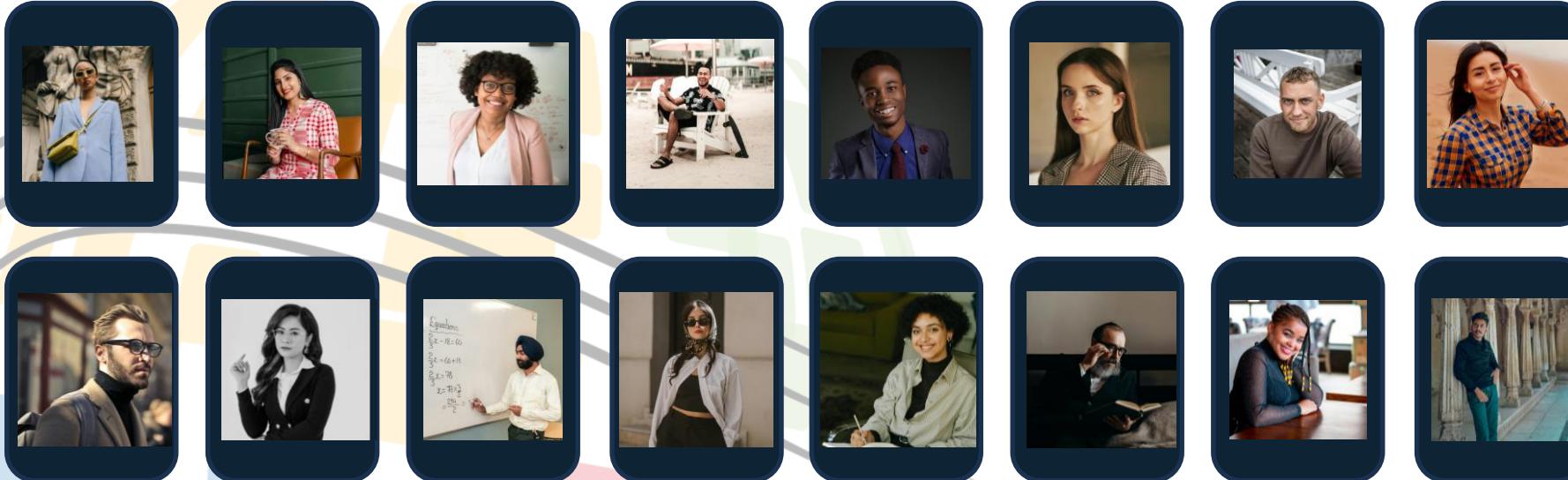
Top Trumps



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

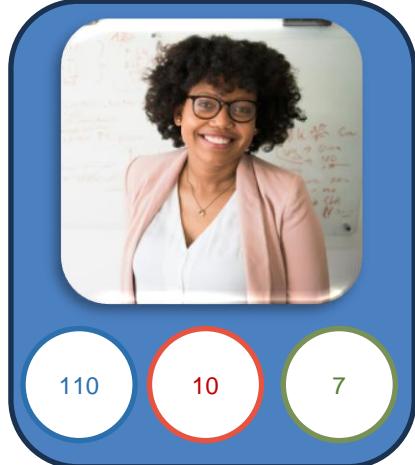
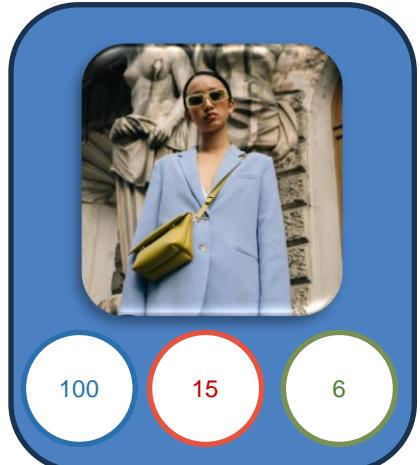
Your Teams

- 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



Raw intelligence (Std IQ)

Domain Expertise (0-20)

Engineering Skill (0-10)

IQ

DOM

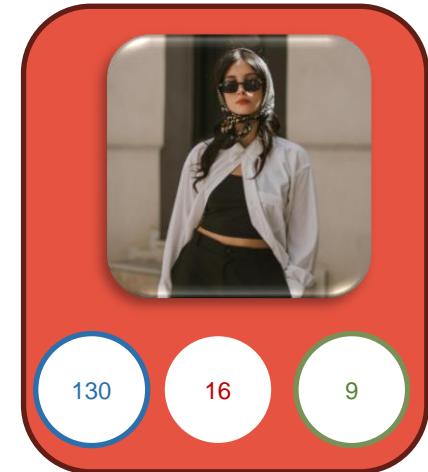
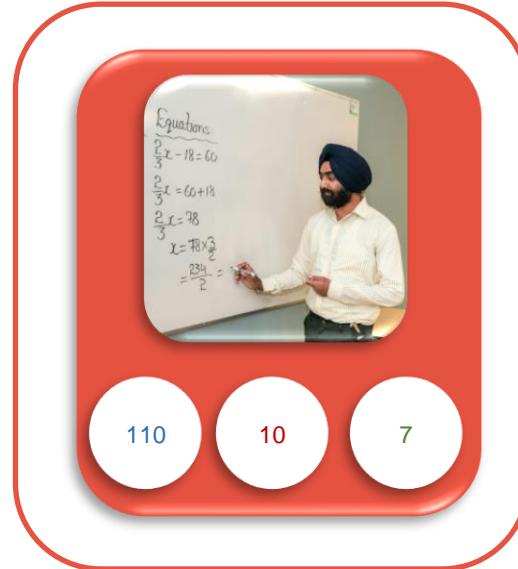
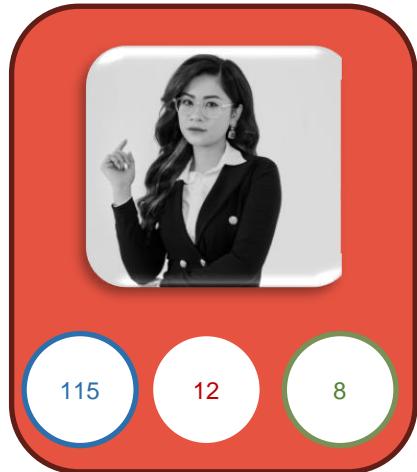
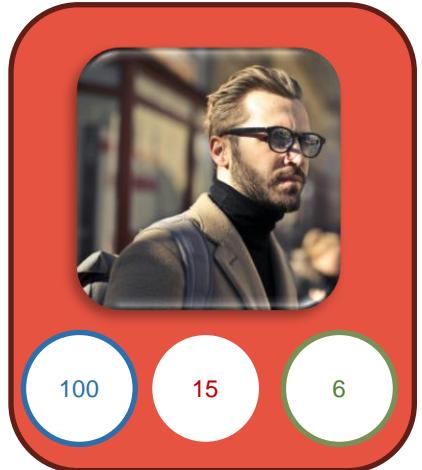
ENG

Role: Systems Architect

Team Selection Using Generic Understanding



Team Selection Using Generic Understanding



Raw intelligence (Std IQ)

Domain Expertise (0-20)

Engineering Skill (0-10)



IQ



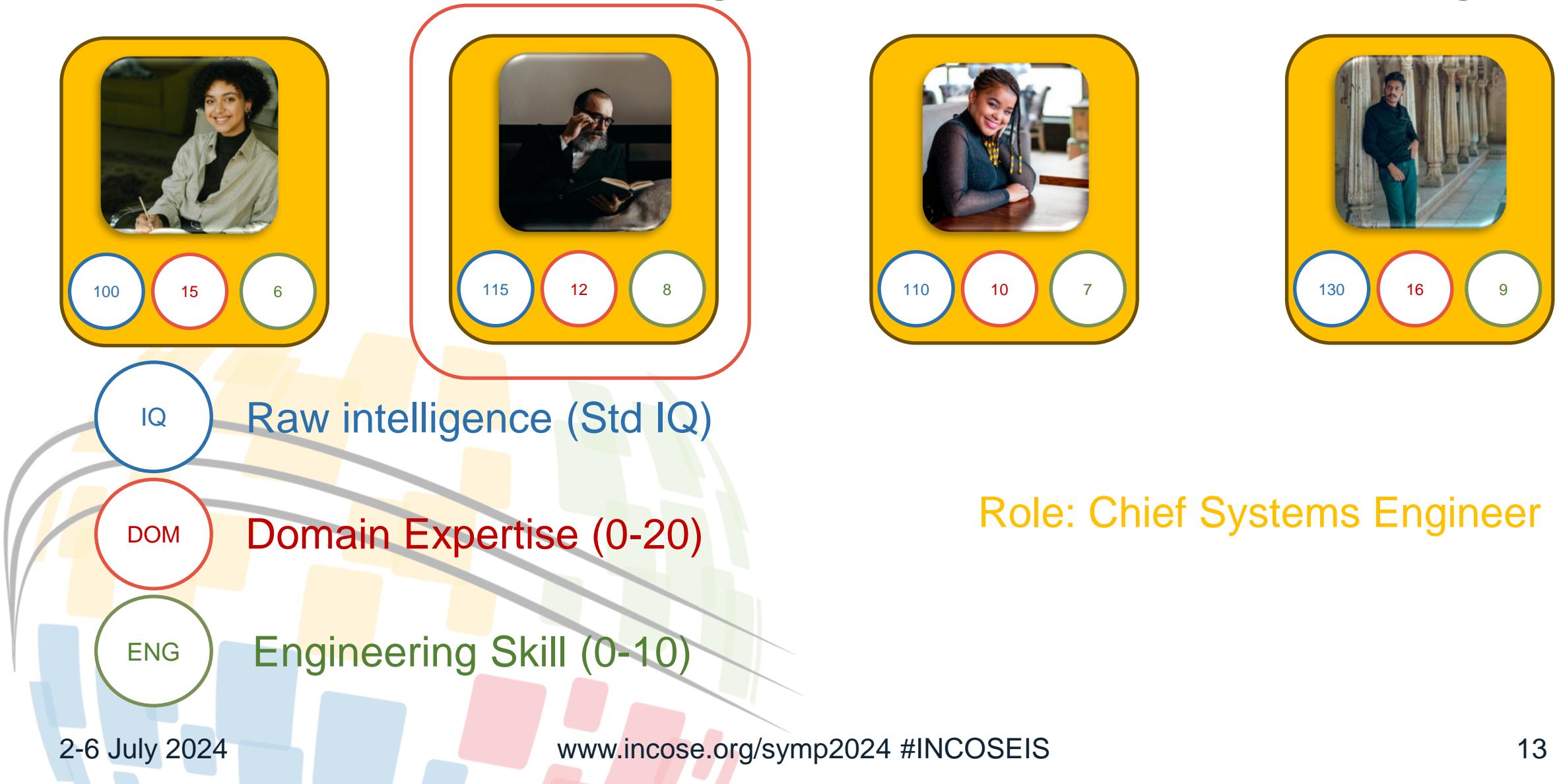
DOM



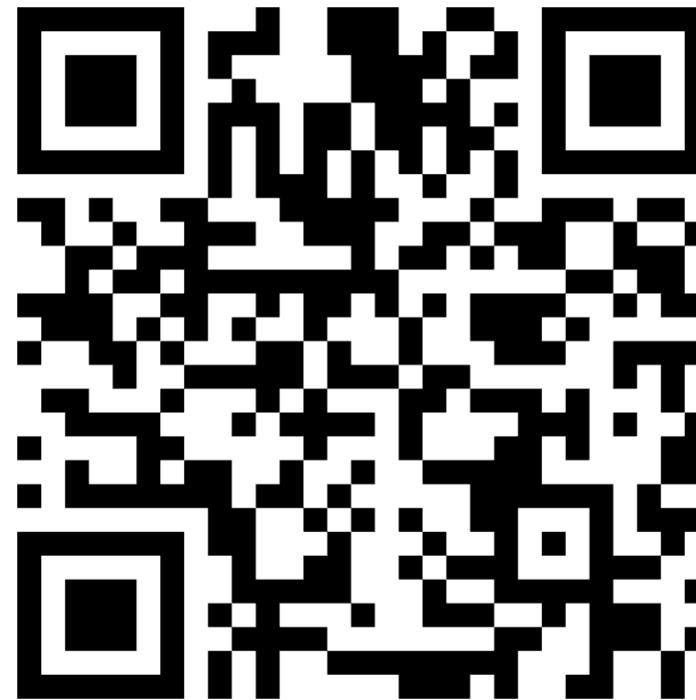
ENG

Role: Systems Modeler

Team Selection Using Generic Understanding

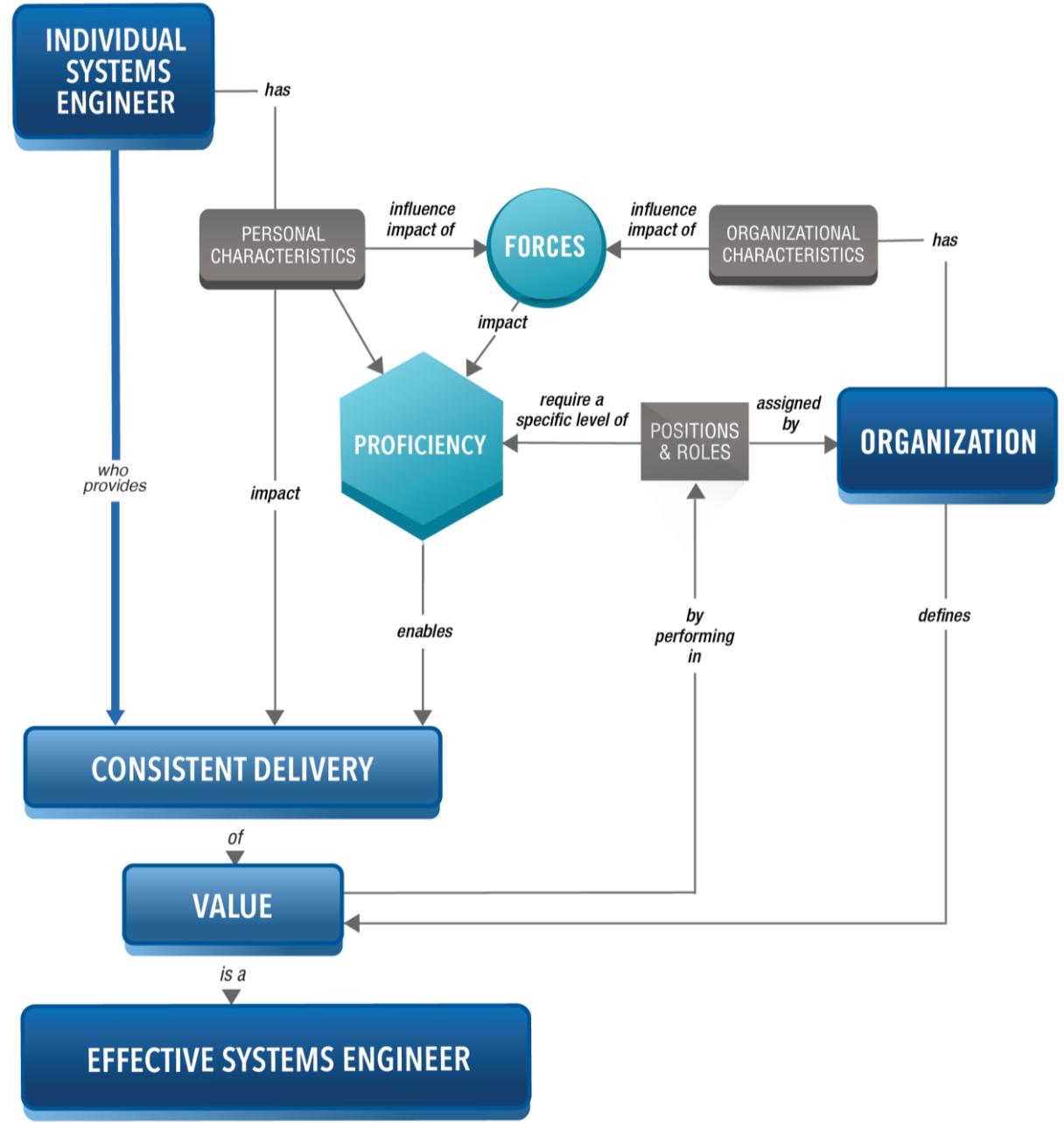
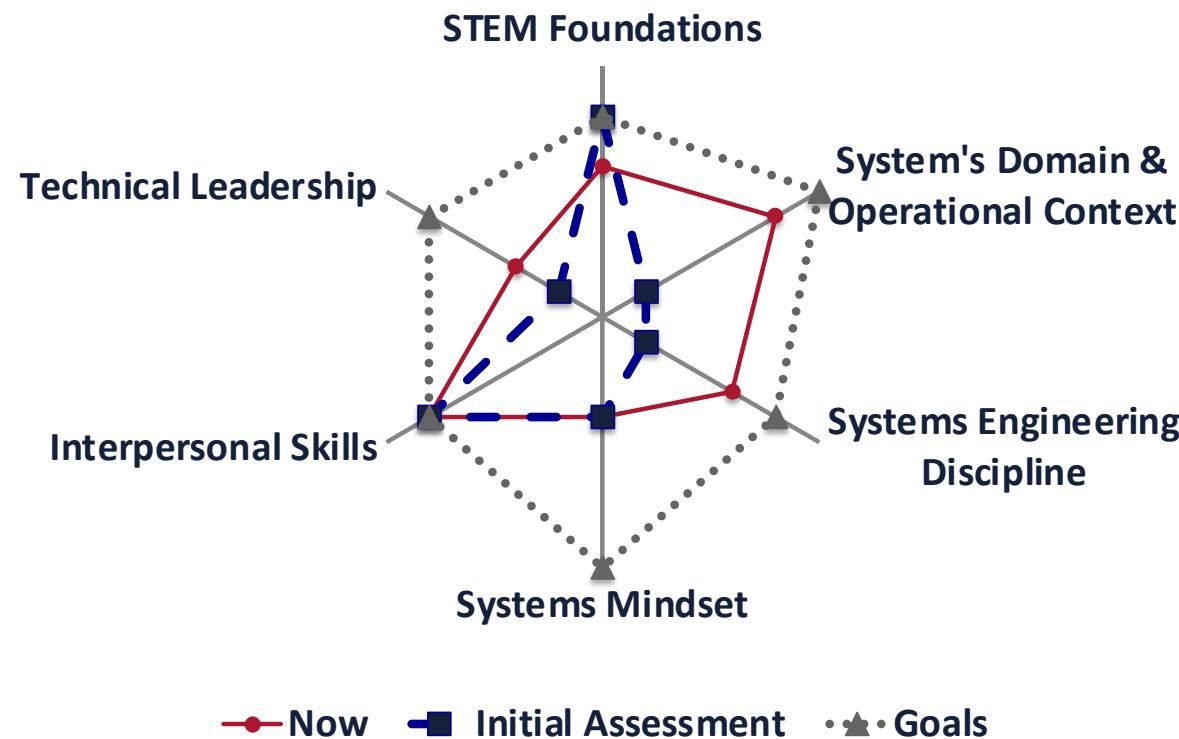


How do you feel they will perform?

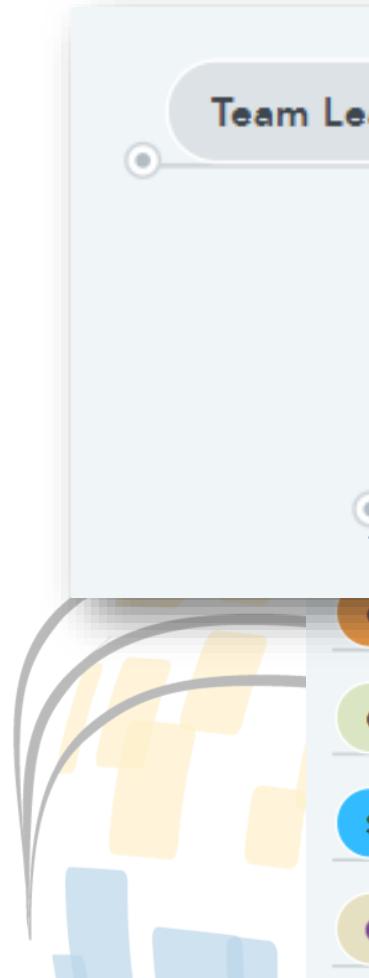


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HelixSE



How can we generate



Motivation

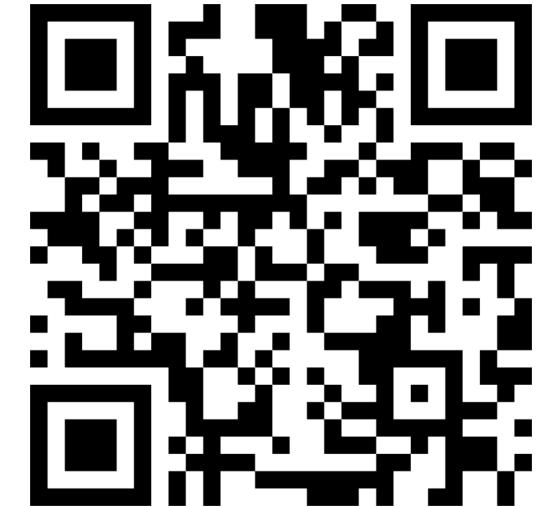
World Economic Forum Top 10 Skills Survey Results

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



Which of these are most important?

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



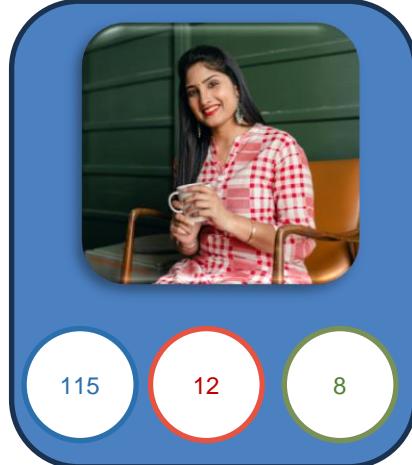
Your Team

- 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)

TLC

Team Leadership & Collaboration (0-10)

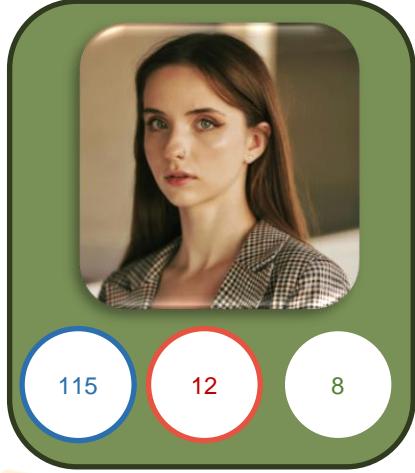
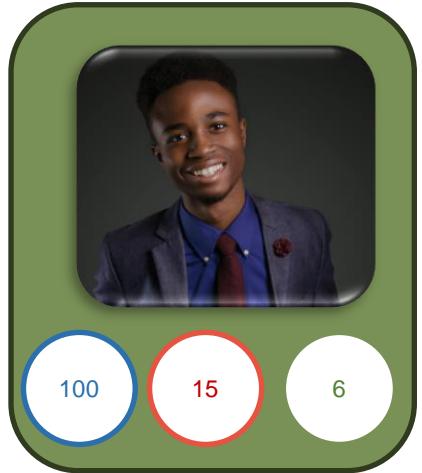
CPS

Complex Problem Solving (0-10)

Role: Systems Architect



Team Selection Using Employability Skills



SLL

Self-Leadership & Learning (0-10)

TLC

Team Leadership & Collaboration (0-10)

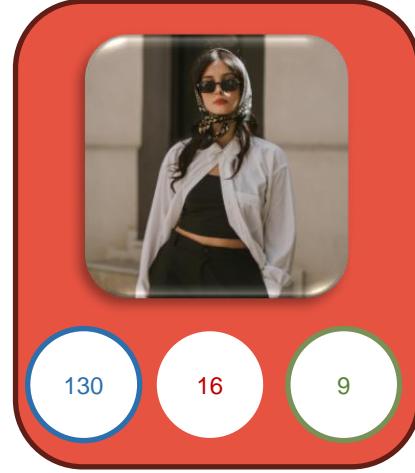
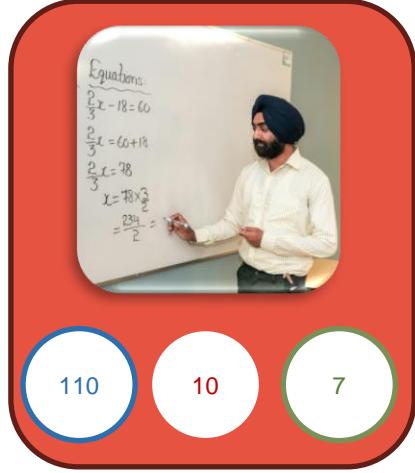
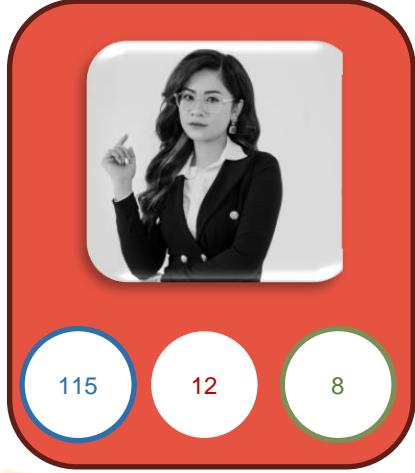
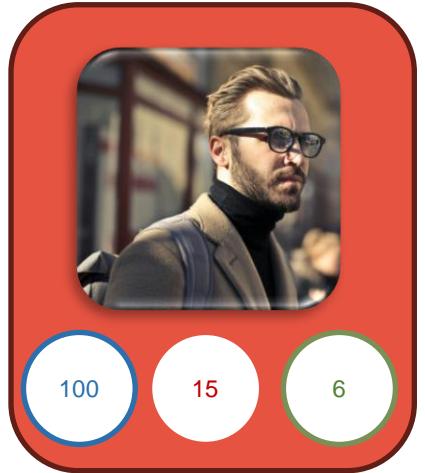
CPS

Complex Problem Solving (0-10)

Role: Stakeholder and Requirements Manager



Team Selection Using Employability Skills



SLL

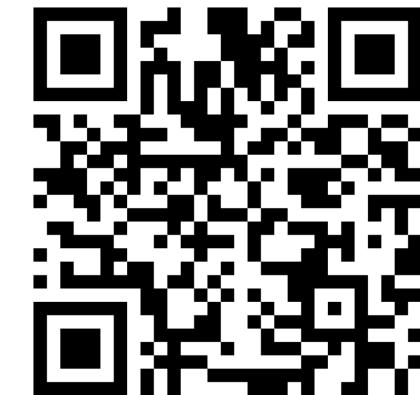
Self-Leadership & Learning (0-10)

TLC

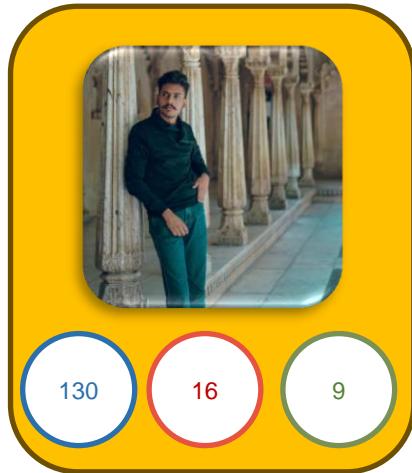
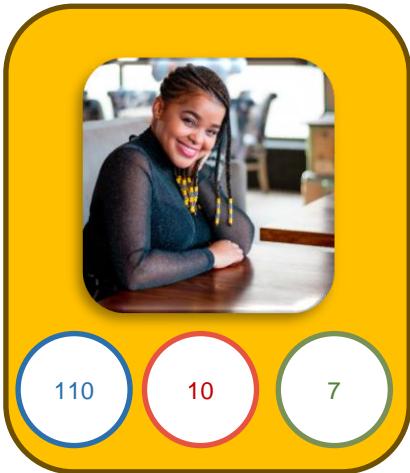
Team Leadership & Collaboration (0-10)

CPS

Complex Problem Solving (0-10)



Team Selection Using Employability Skills



SLL

Self-Leadership & Learning (0-10)

TLC

Team Leadership & Collaboration (0-10)

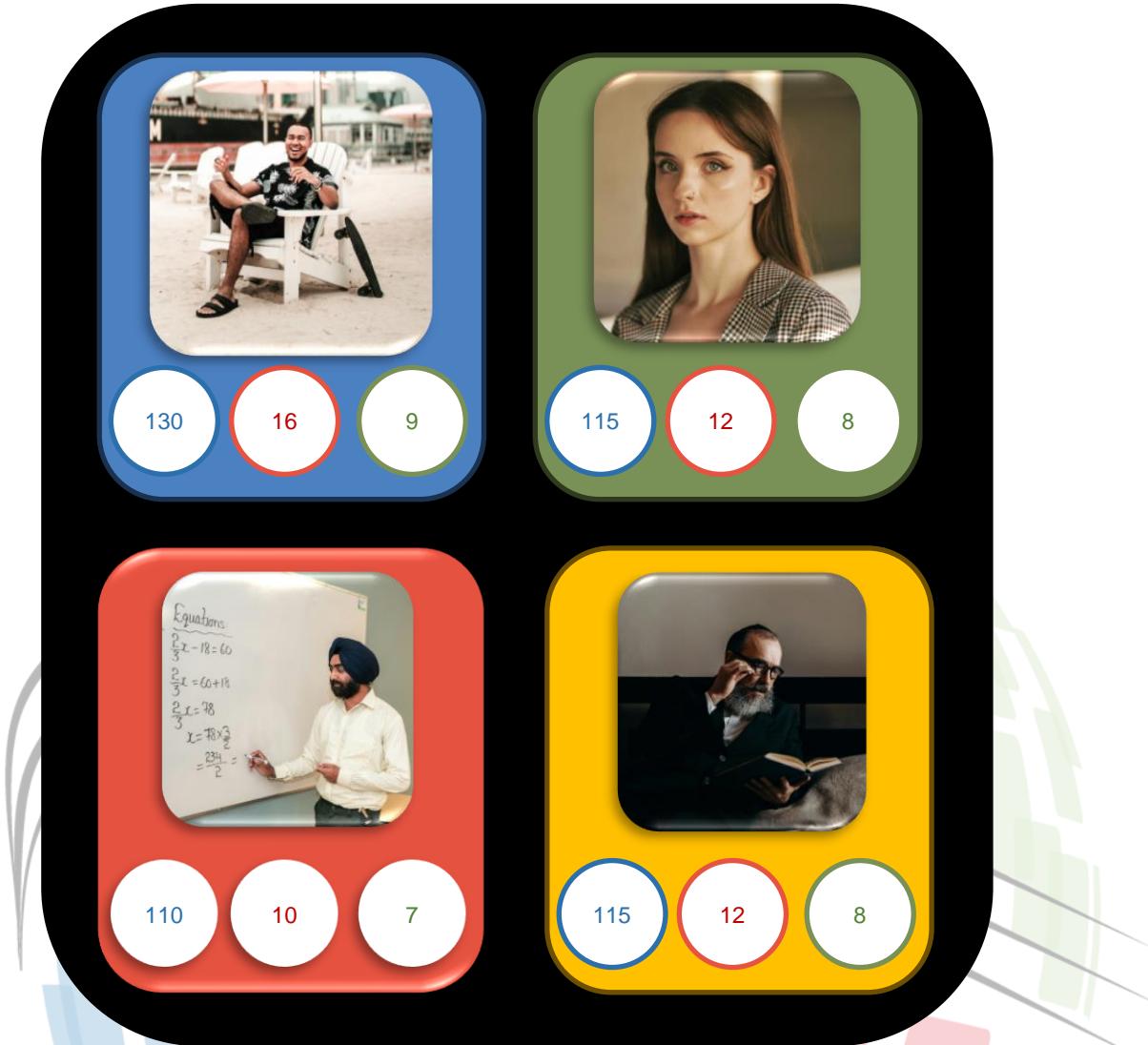
CPS

Complex Problem Solving (0-10)

Role: Chief Systems
Engineer



How did the team evolve?





Why is this important?



complexity

create growth interaction integrate resilient project social
design creativity economics new management priorities products systems talent
chaos competition entrepreneur digital leadership stakeholders unique
change authenticity teams transformation
action business companies experiences ideas organizations technology
agility sustainable trust strategy
consumers interconnected invention resources
innovation flexibility open risk people

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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