Advancement Through Collaboration:
Engineering as a Team Sport in 2025 and Beyond

Russell E. Walker, PhD
Walker Associates

DeVry Engineering Synergy Summit
27 August 2025

Image by Gerd Altmann from Pixabay

Collaboration, Teamwork and Synergy

Collaboration

Two or more people, entities or organizations **working together** to complete a task or achieve a goal.

Teamwork

The **collaborative effort** of a group to achieve a **common goal** or to complete a task in an effective and efficient way.

Synergy

An interaction . . . giving rise to a whole that is **greater than the simple sum of its parts**.

Source: Wikipedia

Image by Rosy / Bad Homburg / Germany from Pixabay

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Great Engineering Is Done by Teams

"Great things . . . are never done by one person. They're done by a team of people."

—Steve Jobs

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Two Burning Questions

- What do synergy, collaboration and teamwork look like in modern engineering?

- How do you prepare to join the team?

Image by Tyli Jura from Pixabay

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Today's Teams: Fast, Fluid, Fully Engaged

Then

Image by Bob Shand via flickr, CC BY-NC 2.0 license

Now

Image by Russell E. Walker

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Developing a Drone
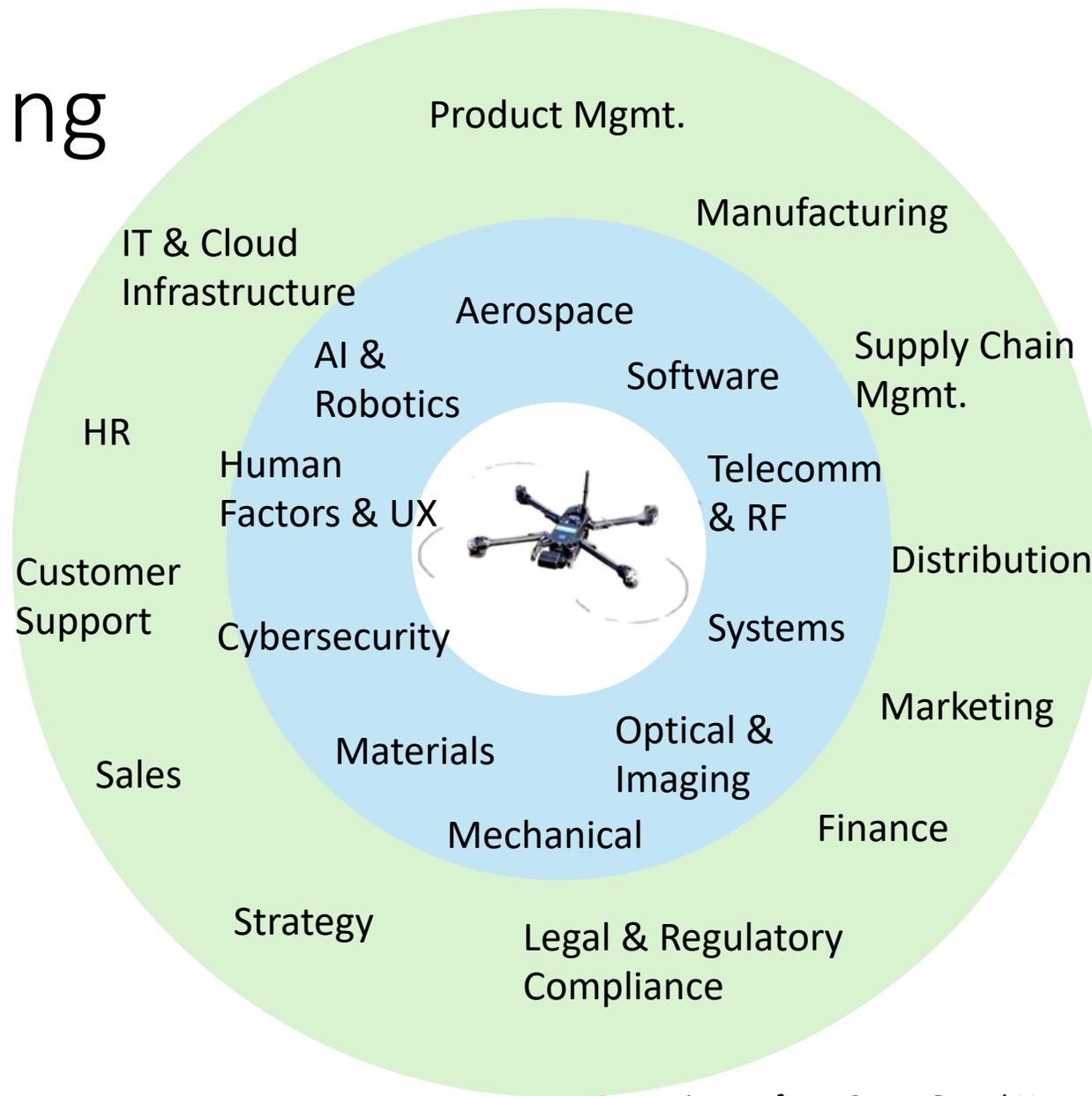
Typical team size:
55-100 engineers

Typical timeframe (concept to production):
18-36 months

Product Mgmt.

Manufacturing

IT & Cloud Infrastructure

Aerospace

Software

Supply Chain Mgmt.

AI & Robotics

HR

Human Factors & UX

Telecomm & RF

Customer Support

Distribution

Cybersecurity

Systems

Marketing

Materials

Optical & Imaging

Mechanical

Finance

Sales

Strategy

Legal & Regulatory Compliance

Drone image from Coast Guard News via flickr, CC BY-NC-ND 2.0 license

Engineering: An Old Field with New Growth

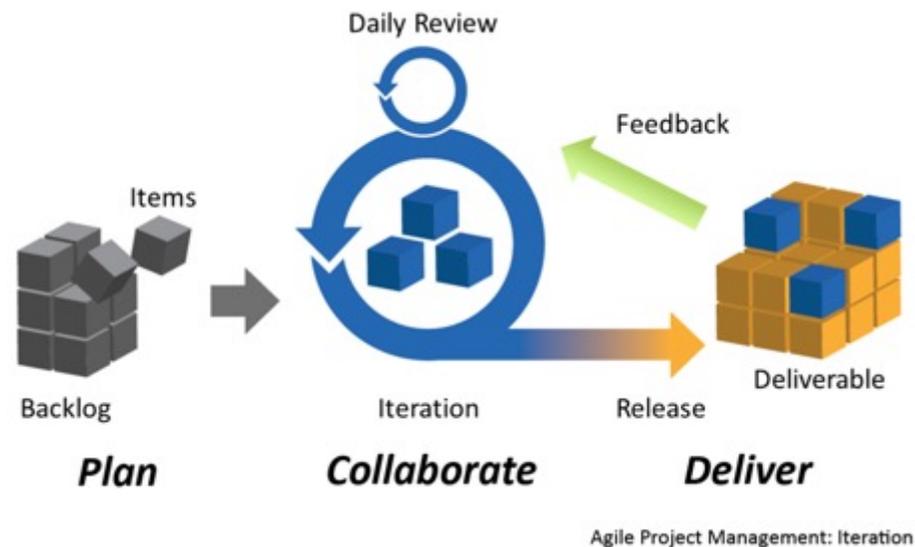Imhotep, the first engineer, designed the Pyramid of Doser (27th century BC)

Emerging Engineering Specialties 2015-2025

Images from Wikimedia Commons, public domain

Specialty	Est. Hiring Growth (2023-33 annual)
AI & ML Engineering	>25%
Data Engineering	~20%
Cybersecurity Engineering	~18%
Quantum Engineering	>30% (niche)
Robotics-Automation Eng.	~15-20%
Sustainability Engineering	~12-15%
Biomedical-Bioinformatics Eng.	~10-12%
Additive Mfg. Engineering	~10%
Digital Twin-Modeling Eng.	~12%

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Engineering Projects Are Increasingly Agile

Agile Project Management: Iteration

% of Organizations Using Agile PM in Specific Areas

Keys to agile project management:
- Fast iteration
- Embrace of change and flexibility
- Close collaboration with stakeholders
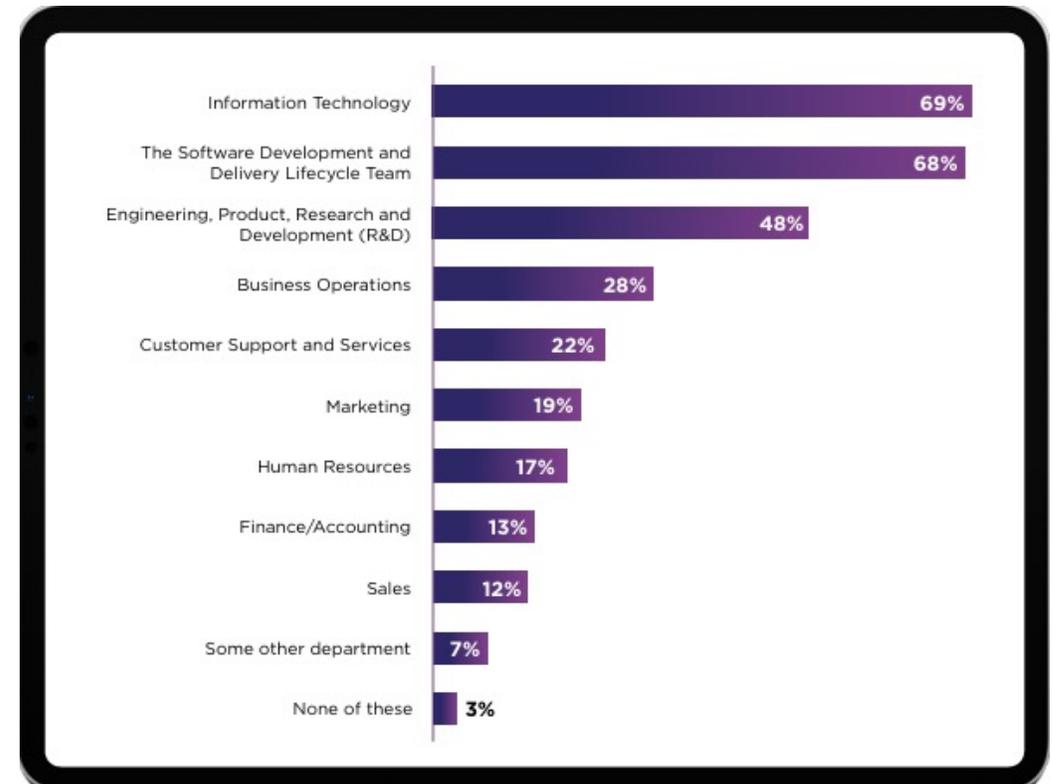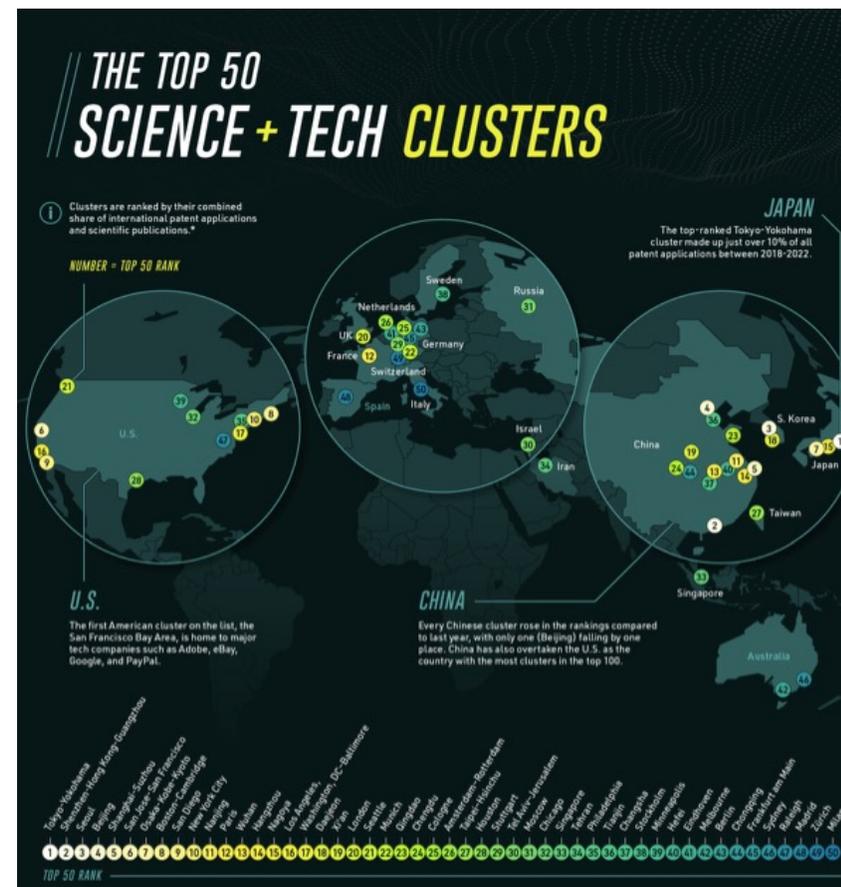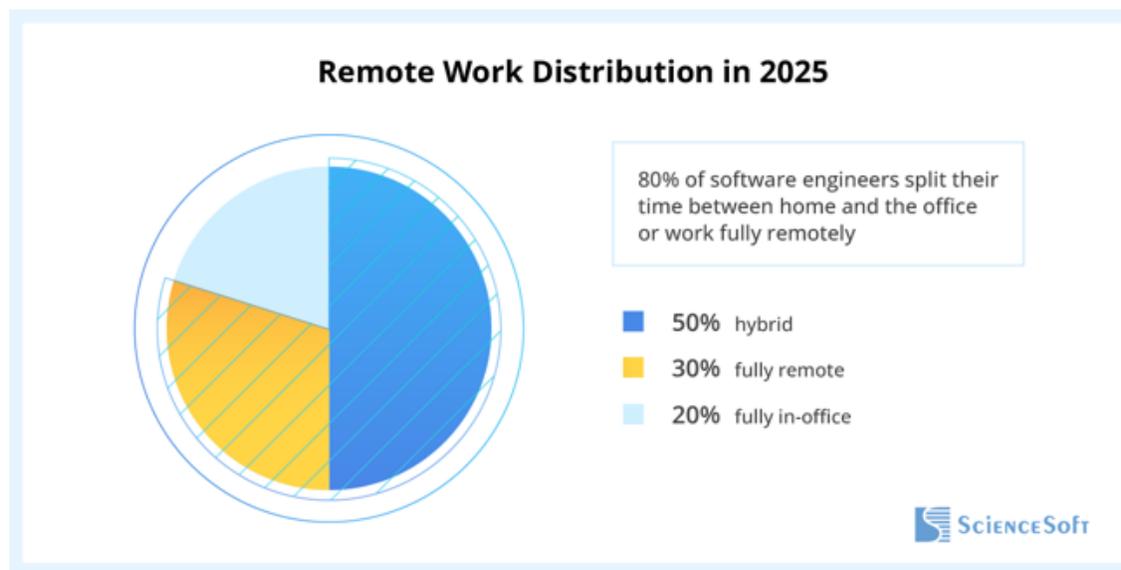- Self-organizing cross-functional teams

Image by Planbox via Wikimedia Commons, CC BY-SA 3.0 license

Chart source: 17th Annual State of Agile Report (Digital.ai, 2023)
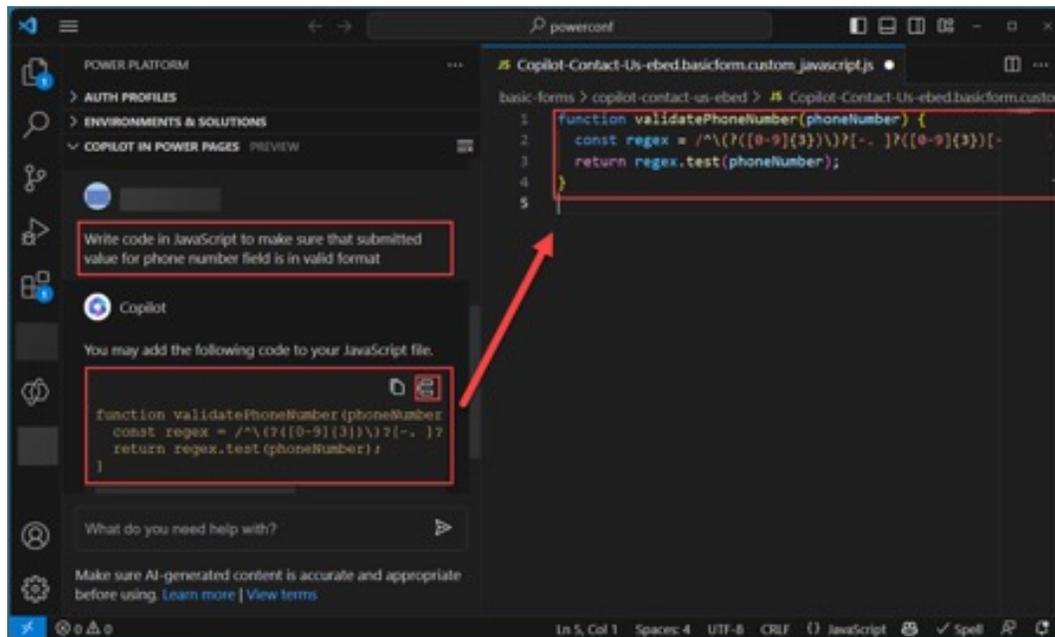
Remote/Hybrid Work and Global Collaboration

Source: The Work From Home Debate (ScienceSoft, 2025)

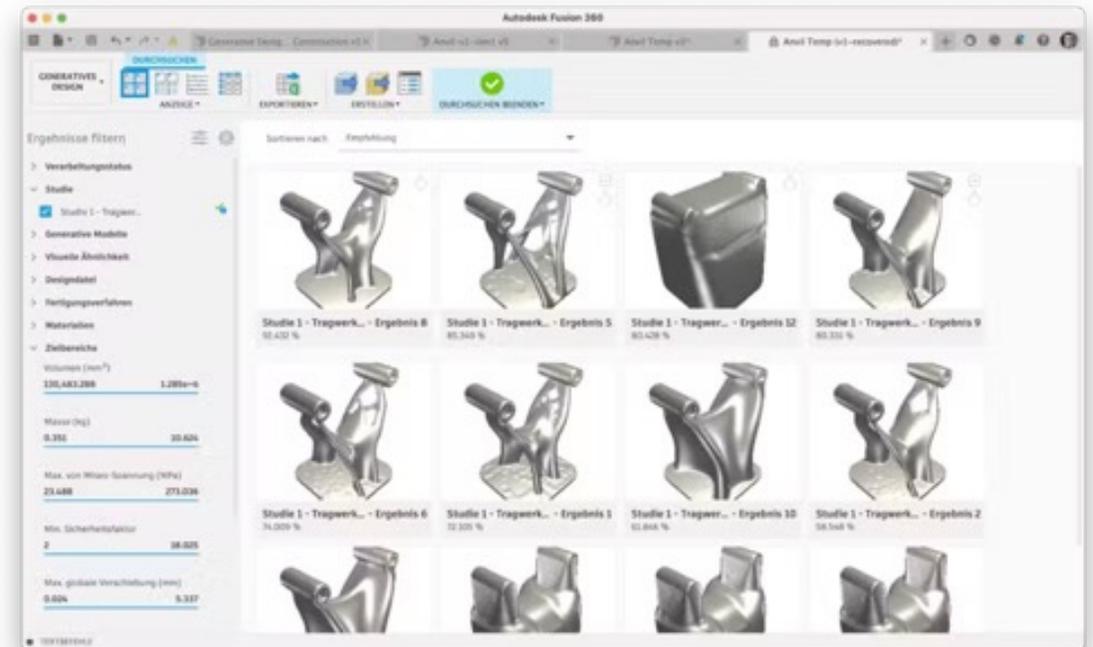Source: Mapped: The World's Top 50 Science and Technology Hubs (Visual Capitalist, 2024)

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AI on the Team

Using MS Copilot to generate a data validation function in VS Code

Generative AI suggesting design alternatives in Autodesk Fusion 360 3D CAD application

Source: Unlocking better engineering with generative design (Dunann Scott/VoxelMatters, 2023)

Source: Add AI-generated code using Copilot (Microsoft, 2025)

AI Is Support Not Replacement

'The dumbest thing I've ever heard': Amazon Web Services CEO lambasts replacing junior employees with AI, but he still loves AI
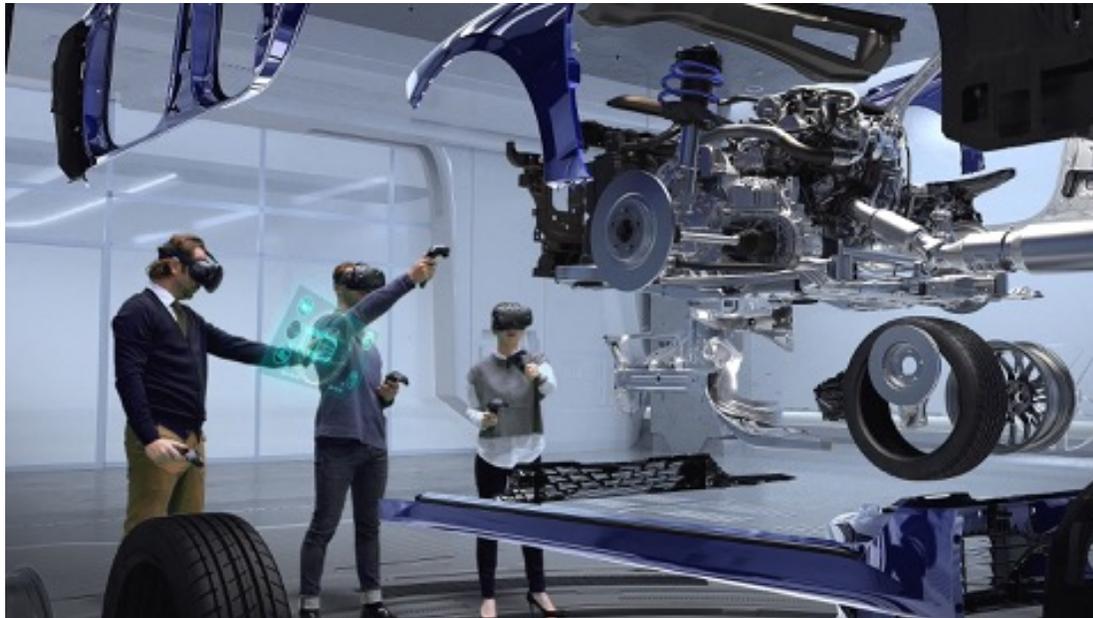
News By **Stevie Bonifield** published yesterday

AWS CEO Matt Garman spoke up for entry-level jobs, but still insists AI will change all jobs.

Source: PCGamer.com

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Collaborating in Virtual Worlds

Hyundai and Kia Debut Virtual Reality (VR) Design Evaluation System

Source: hyundainews.com, 2019

A construction engineer overlays 3D CAD models of building plans onto the physical site

Source: AR in Engineering (ArborXR, 2024)

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3D Printing Speeds Prototyping

Ford's 3D Printing Centre in Cologne, Germany supports EV prototyping and production

Engineer tries out a 3D printed wing mirror prototype for the Electric Explorer

Source: media.ford.com, 2023

Source: tctmagazine.com, 2024

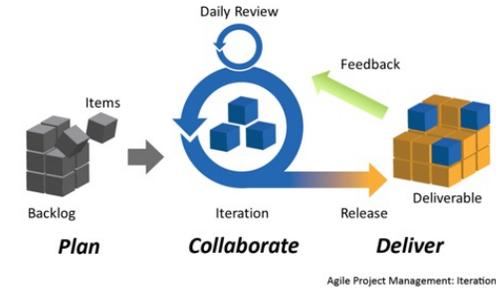Russell E Walker PhD
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Burning Question 1: What Do Synergy, Collaboration and Teamwork Look Like?
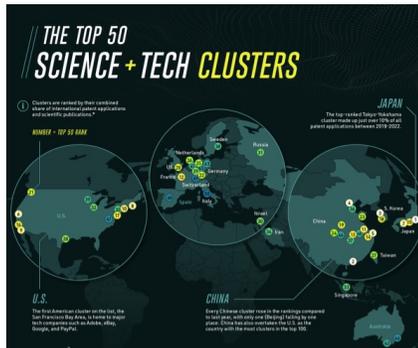

Fast, fluid, fully engaged

Spanning many engineering disciplines and business areas

Organized as agile projects

Connecting remote and hybrid workers, often globally

Leveraging new technologies:
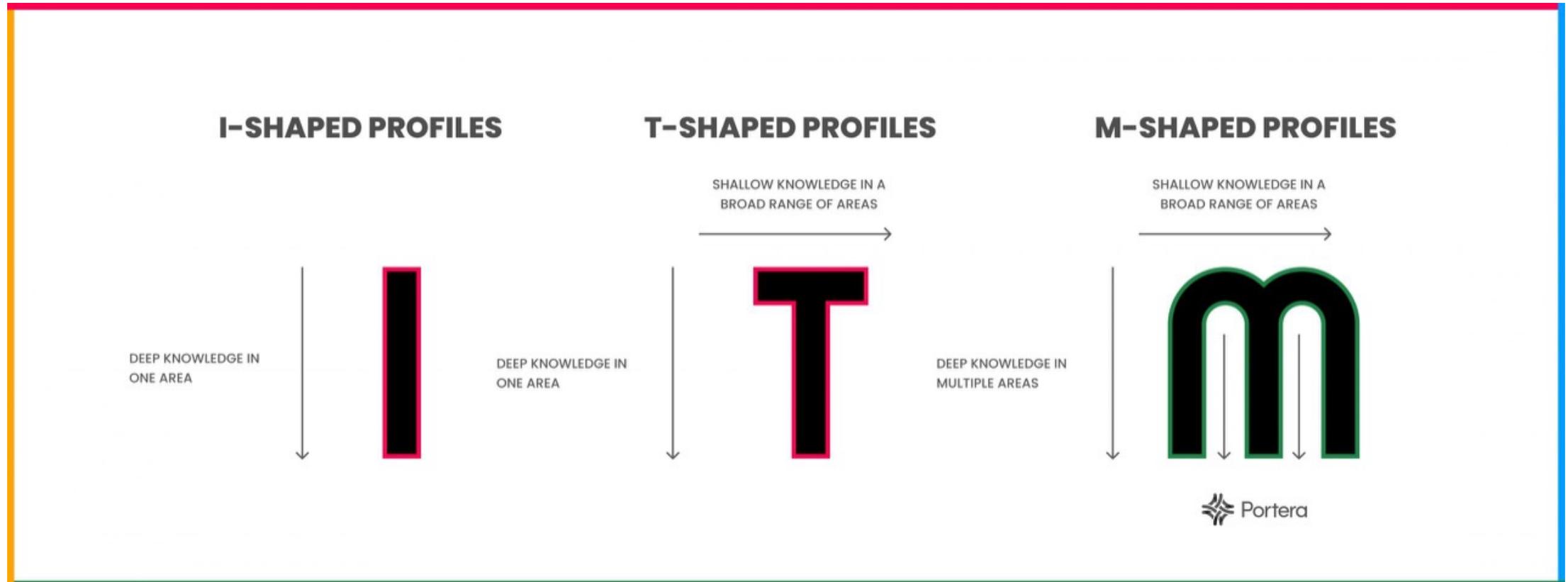AI, AR/VR, 3D printing and more

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Two Burning Questions

- What do synergy, collaboration and teamwork look like in modern engineering?

- **How do you prepare to join the team?**

Image by Tyli Jura from Pixabay

Become an "m-shaped" Person

I-SHAPED PROFILES

DEEP KNOWLEDGE IN ONE AREA

T-SHAPED PROFILES

SHALLOW KNOWLEDGE IN A BROAD RANGE OF AREAS

DEEP KNOWLEDGE IN ONE AREA

M-SHAPED PROFILES

SHALLOW KNOWLEDGE IN A BROAD RANGE OF AREAS

DEEP KNOWLEDGE IN MULTIPLE AREAS

Portera

Source: M-shaped people—the key to successful digital transformation (Doug Killick, Portera)

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Work Hard on "Soft Skills"

Soft skills most important for entry-level engineers

1. Reliability
2. Working in teams
3. Responsibility
4. Self-motivation
5. Positive attitude

Soft skills with largest gap between importance and proficiency

1. Communicating with diverse groups
2. Time management
3. Writing effectively
4. Dealing with uncertainty
5. Communicating across age groups

Source: Hirudayaraj, M., Baker, R., Baker, F., & Eastman, M. (2021). Soft Skills for Entry-Level Engineers: What Employers Want. Education Sciences, 11(10), 641. https://doi.org/10.3390/educsci11100641
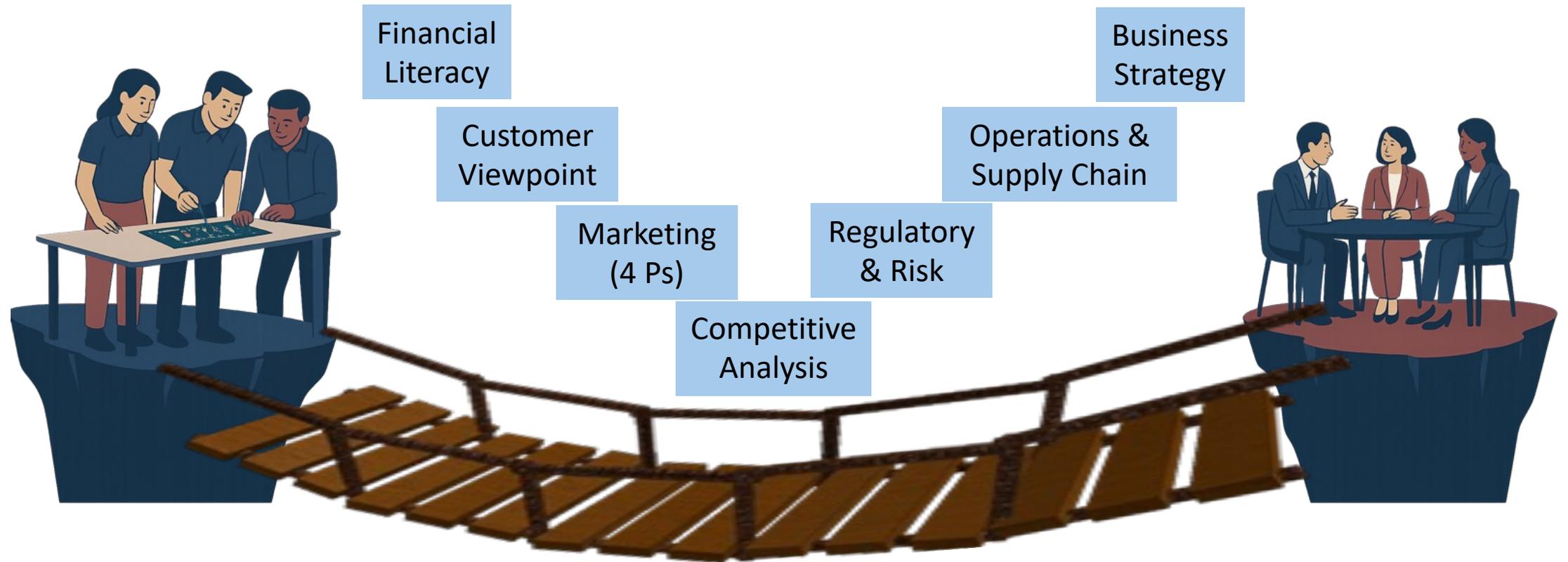
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AI Makes "Soft Skills" Even More Valuable

80% say soft skills are more important than ever with the evolution of AI

Source: Wiley Workplace Intelligence survey of 2,014 people across a variety of industries (April 2024)

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Build Bridges to Business

Financial Literacy

Customer Viewpoint

Marketing (4 Ps)

Competitive Analysis

Regulatory & Risk

Operations & Supply Chain

Business Strategy

Rope bridge image from clipartmax.com. Other images generated with Microsoft Copilot

Be a Lifelong Learner

"Learning is not compulsory; it's voluntary. Improvement is not compulsory; it's voluntary. But to survive, we must learn."

—W. Edwards Deming, father of Total Quality Management

Image via picryl, public domain

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Engage with a Community

Image from Orange County CA ACM Chapter

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Burning Question 2: How Do You Prepare to Join the Team?
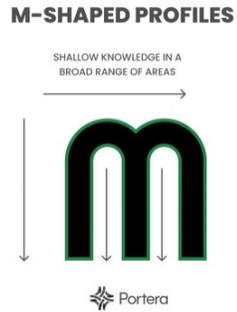
Become an "m"-shaped person

Work hard on soft skills

Build bridges to business

Be a lifelong learner

Engage with a community

"Soft skills" image by Nick Youngson via Pix4free, CC BY-SA 3.0 license

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Join the Team and Get in the Game!

Image by This_is_Engineering from Pixabay

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