



Connection and Convergence: Education, Training, and Data Science

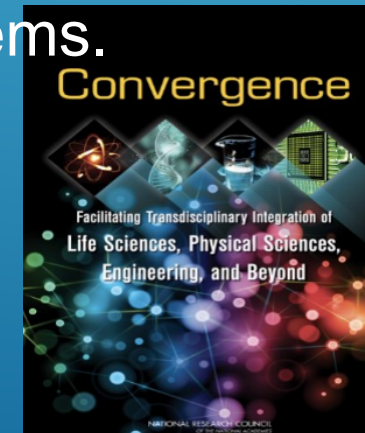
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- ▶ http://sites.nationalacademies.org/DEPS/BMSA/DEPS_192400
- ▶ Join the Webcast: <https://nasem.zoom.us/j/397579857>

ROUNDTABLE ON DATA SCIENCE POSTSECONDARY EDUCATION MEETING#11: DATA SCIENCE EDUCATION AT TWO-YEAR COLLEGES

CONVERGENCE

The grand challenges of today -- protecting human health; understanding the food, energy, water nexus; exploring the universe at all scales -- will not be solved by one discipline alone. Convergence blends scientific disciplines in a coordinated, reciprocal way and fosters the robust collaborations needed for successful inquiry. Convergence builds and supports creative partnerships and the creative thinking needed to address complex problems.



WHAT WE MEAN BY CONVERGENCE:

- ▶ A specific and compelling problem, science or societal
- ▶ Deep integration across disciplines

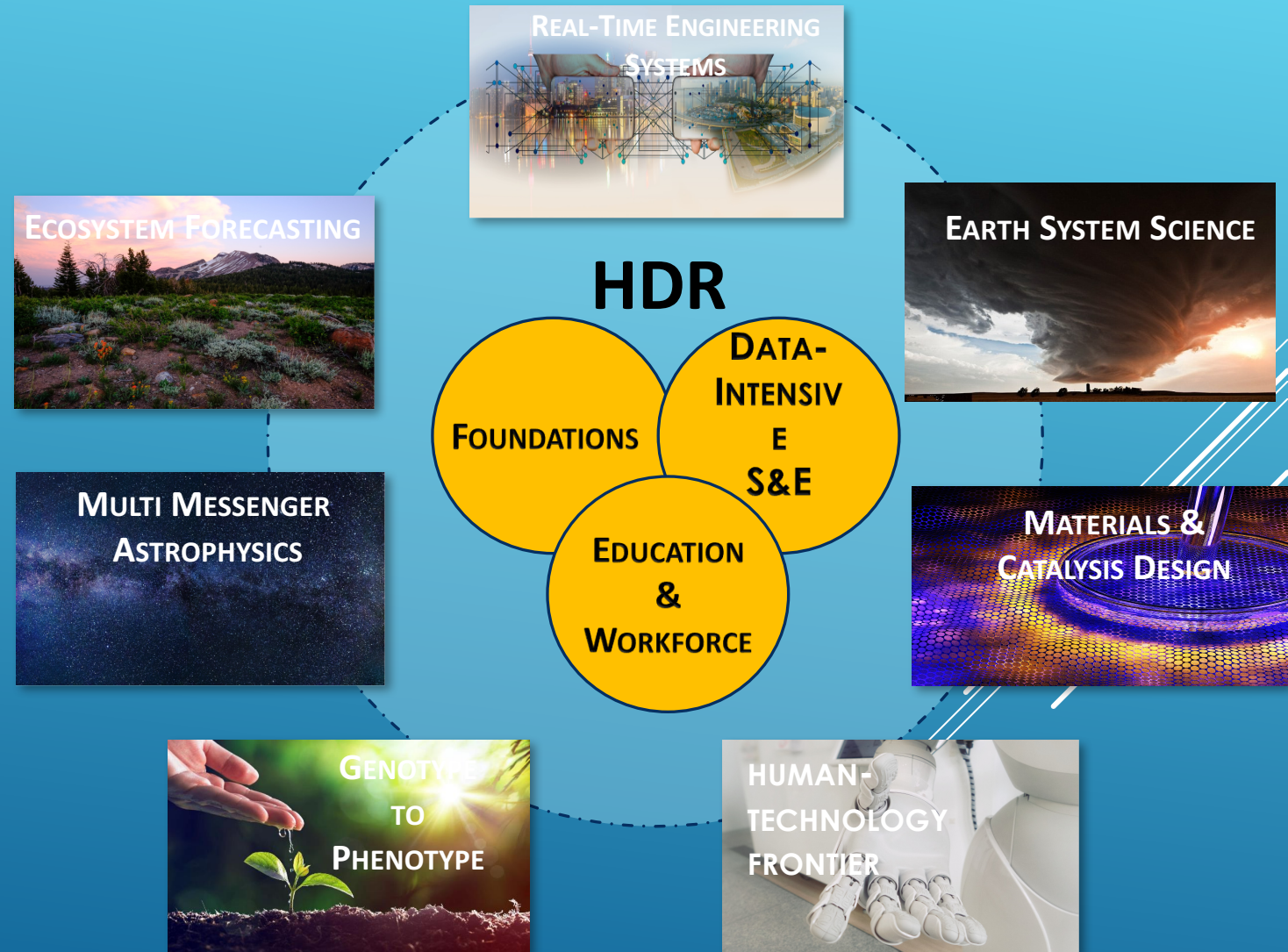
MADE FOR DATA SCIENCE
AND ANALYTICS!



*“Engage NSF’s research community in the pursuit of **fundamental research in data science and engineering**, the development of a cohesive, federated, national-scale approach to **research data infrastructure**, and the development of a **21st-century data-capable workforce**.”*

HARNESSING THE DATA REVOLUTION VISION

HDR will enable new modes of data-driven discovery that will allow fundamental questions to be asked and answered at the frontiers of science and engineering.



HARNESSING THE DATA REVOLUTION (HDR): OVERVIEW

COMPONENTS OF THE HDR VISION

► FOUNDATIONS OF DATA SCIENCE

► EDUCATION AND WORKFORCE
DEVELOPMENT

► DATA-INTENSIVE SCIENCE AND
ENGINEERING

► MS AND SYSTEMS FOR DATA
SCIENCE

► DATA CYBERINFRASTRUCTURE

HDR PROGRAMMATICS

HDR TRIPODS (FY19)

DATA SCIENCE CORPS (FY19)

HDR INSTITUTES

► CONCEPTUALIZATION (FY19)

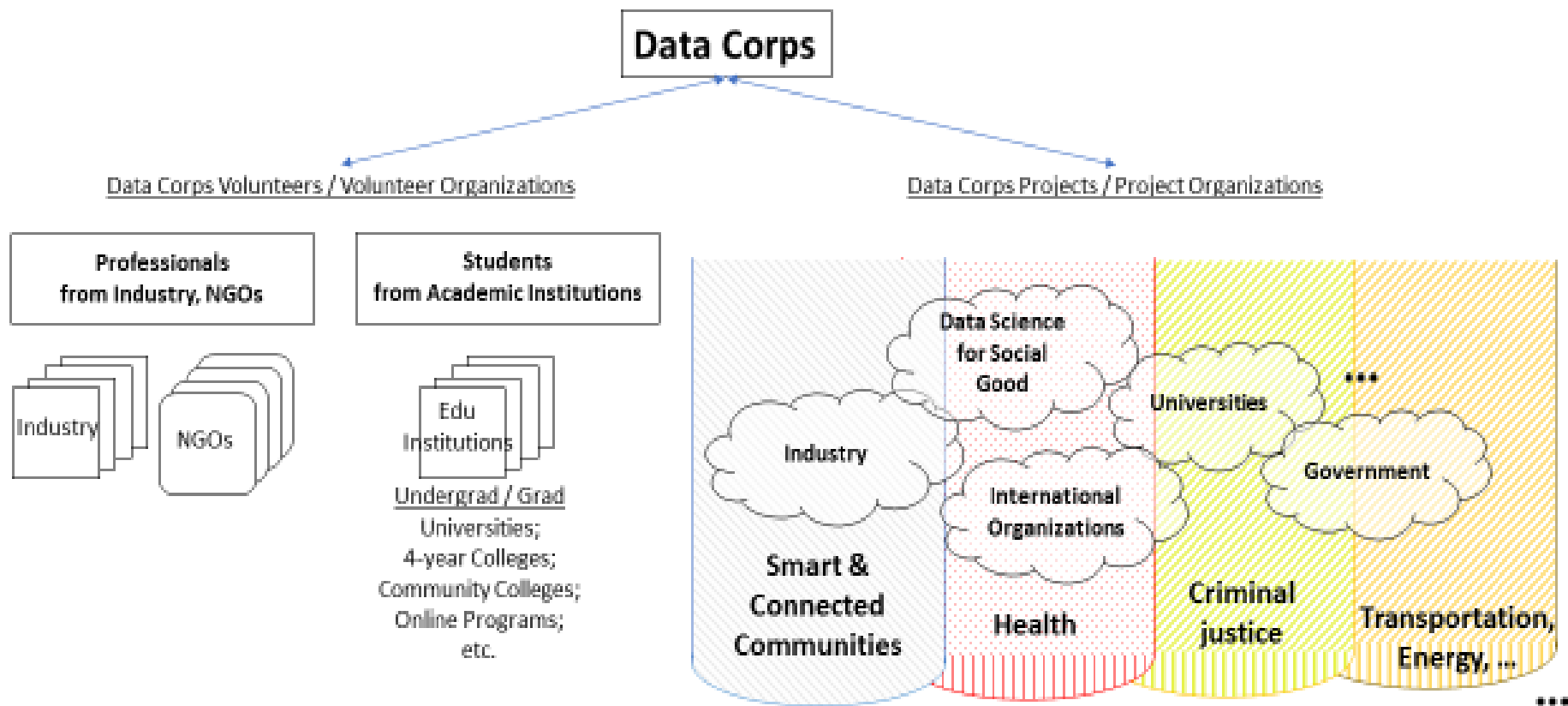
► IDEAS LABS

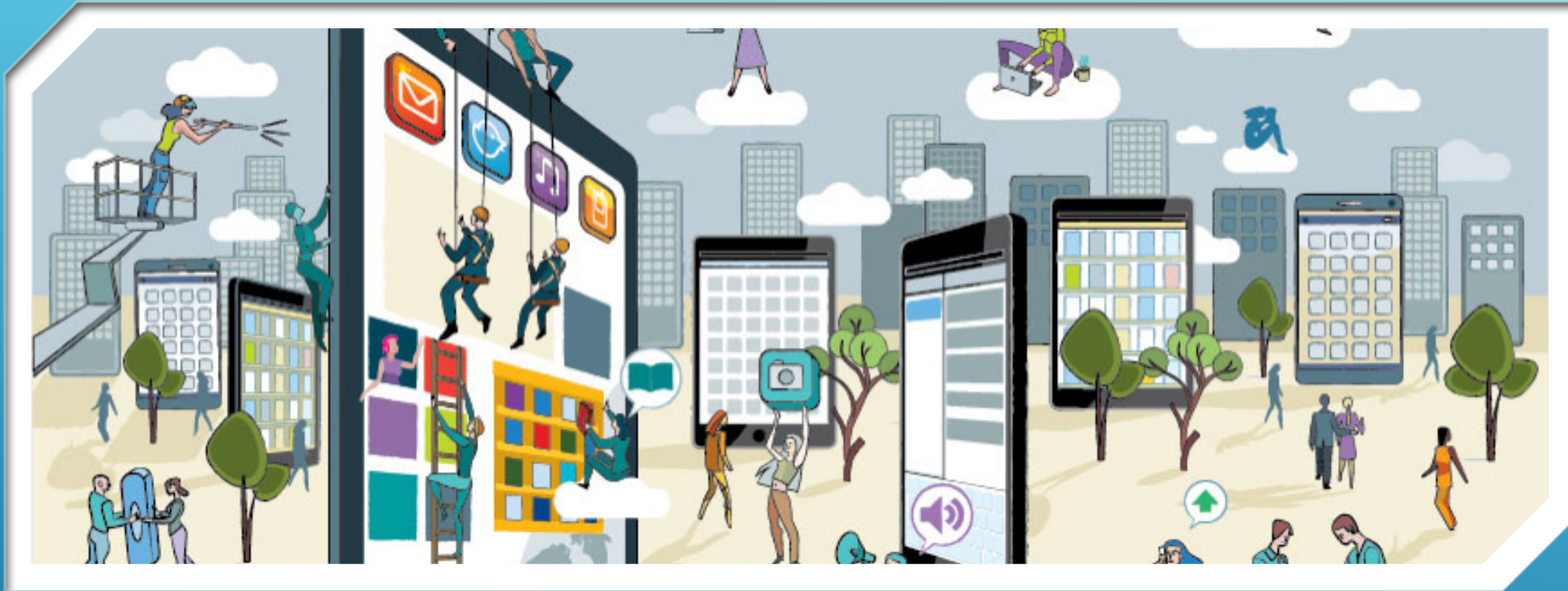
► FRAMEWORKS

► COORDINATION (FY20)

► CONVERGENCE (FY21)







THE FUTURE OF WORK AT THE HUMAN-TECHNOLOGY FRONTIER

- ▶
- ▶ Building the human-technology partnership
- ▶ Augmenting human performance
- ▶ Illuminating the socio-technological landscape
- ▶ Fostering lifelong learning.




RESEARCH THEMES

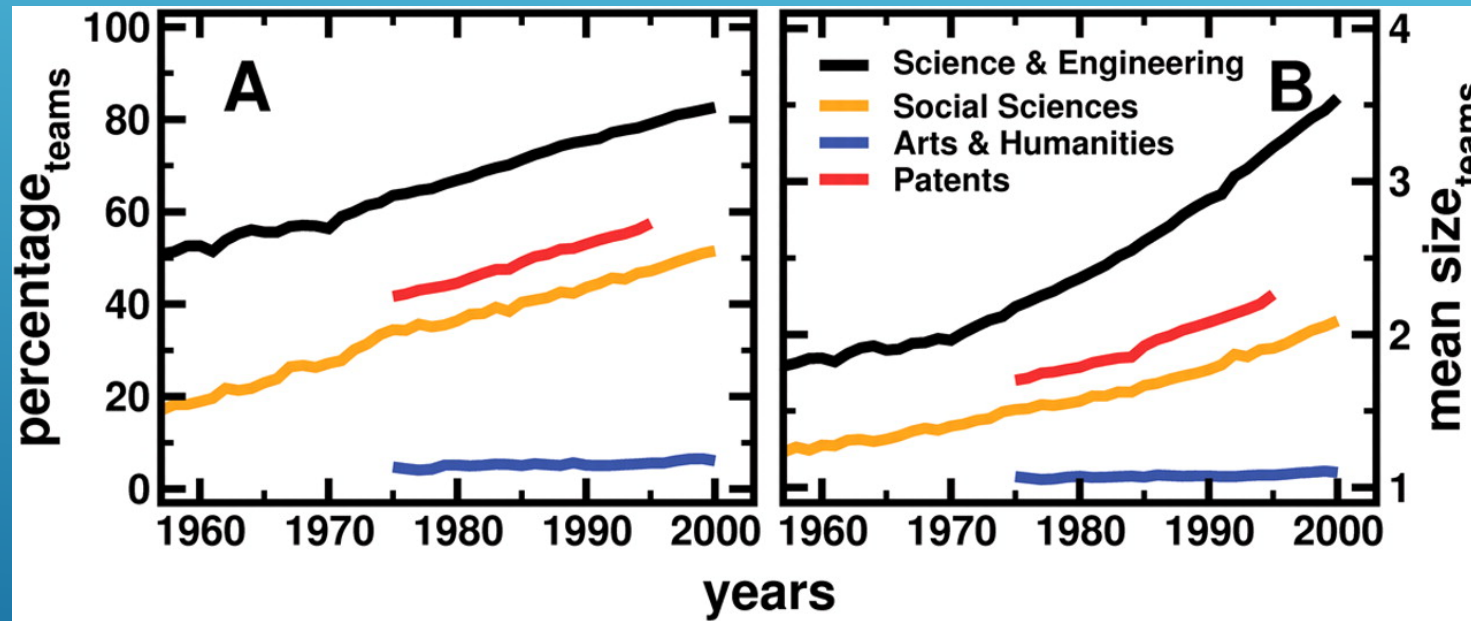
Siloed Sciences



REASONS TO COLLABORATE

- ▶ “Wicked problems” – can’t be solved by a single discipline
 - ▶ Access to expertise or particular skills
 - ▶ Access to equipment, resources, or funding
 - ▶ Enhancing trainee education
 - ▶ **Impact**
- 
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RESEARCH INCREASINGLY DONE BY INVESTIGATOR TEAMS



Over the last 50 years, the proportion of science and engineering publications authored by teams (vs. solo authorship) has increased more than 60%

LEVELS OF TEAM SCIENCE

Unidisciplinary

- Researchers from a single discipline work together to address a shared research problem

Multidisciplinary /Interdisciplinary

- Researchers from different disciplines work independently, sequentially from own disciplinary perspective to address a shared research problem

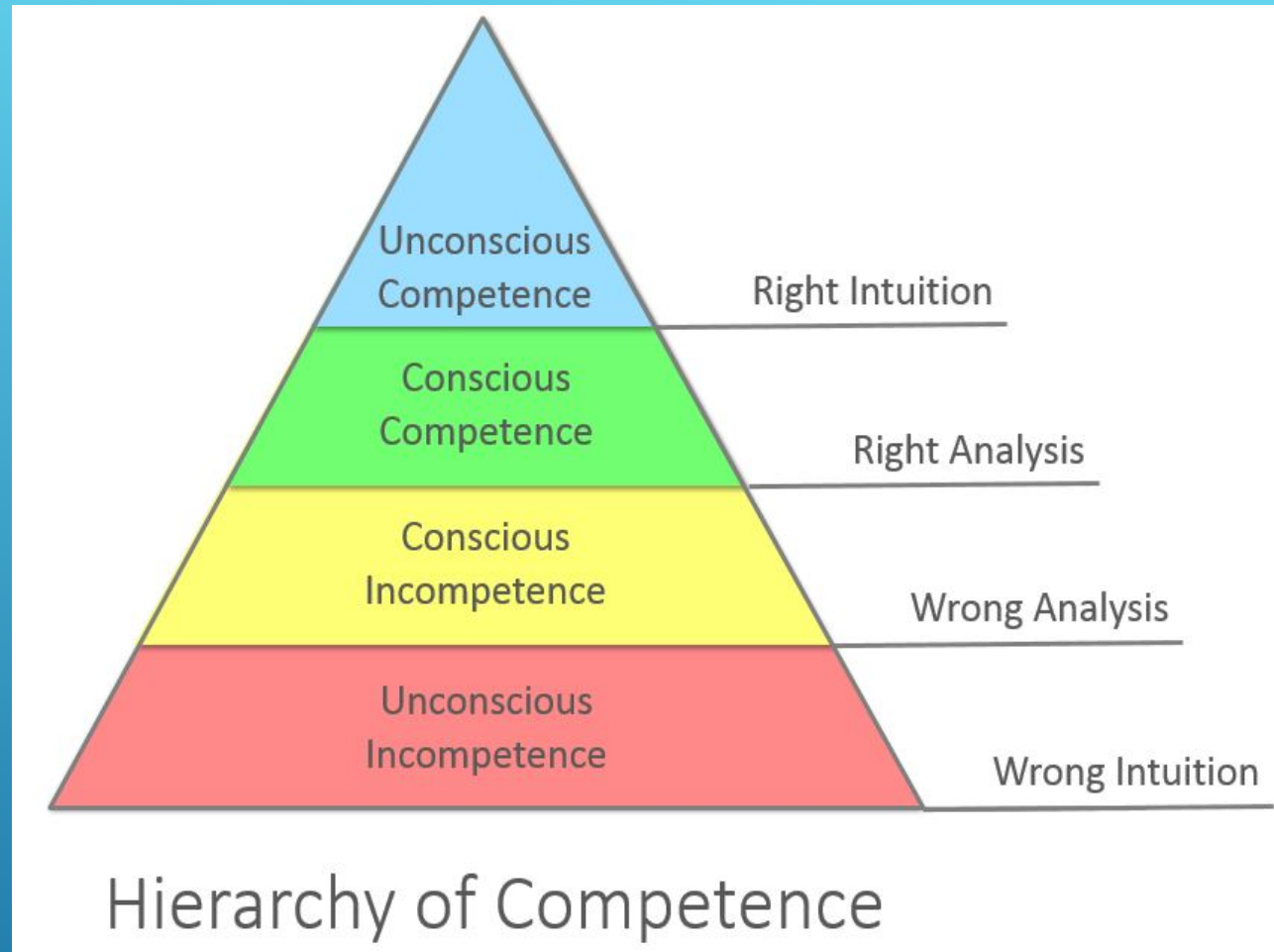
Transdisciplinary

- Researchers from different disciplines work together to integrate theory, methods or concepts that extend discipline-specific language and models

- ▶ The global supply of information-technology professionals with advanced analytics skills is projected to double between late 2018 and late 2020 to one million workers...*
- ▶ Even in the US, it is doubling.

*Bain & Co. quoted in WSJ, April 30, 2019

DATA SCIENCE TRAINING BEGINNING TO CATCH UP



COMPETENCE & SYNERGY

MY HOPE:

THINK EDUCATION, NOT JUST
TRAINING

THINK NEXT GENERATION,
NOT NEXT YEAR

THINK CONVERGENCE



NOT YET, BUT YOU CAN MAKE IT
HAPPEN!

Thank you!

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