

# IDT: Why are we here?

A new look at old ideas

Thursday, August 29, 2019 | 8:30 AM CST

Dr. Chris Alexander, PE, President



If you torture the data  
long enough, it eventually  
confesses...

# Today's Talk

- Learning from ourselves
- Mystery of the human brain – facts and figures
- Today's issue is not data generation, it's data processing
- The ideal scenario – *we need to paint a picture*
- What role can we play?

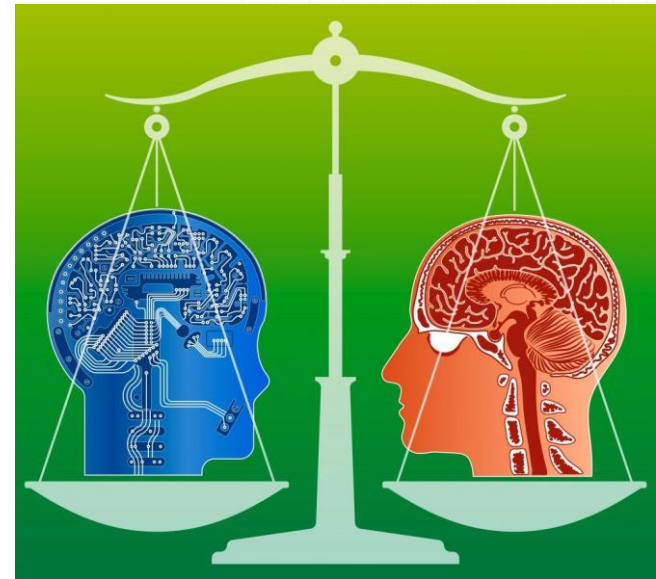
# Learning from ourselves



Dutch film maker, photographer, and father Frans Hofmeester of his daughter, Lotte (year 1 to 18)

# The Human Brain

- Weighs 3 lbs
- Uses 20% of our oxygen
- Has 100 billion neurons
- Processing speed:
  - Computer:  $55 \times 10^{15}$  cps\*
  - Brain:  $1 \times 10^{18}$  cps
- Unlike computers, brains can perceive, interpret, store, analyze, and redistribute data at the same time.



\* 55 petaFLOPS. A petaFLOP is a quadrillion floating point calculations per second.

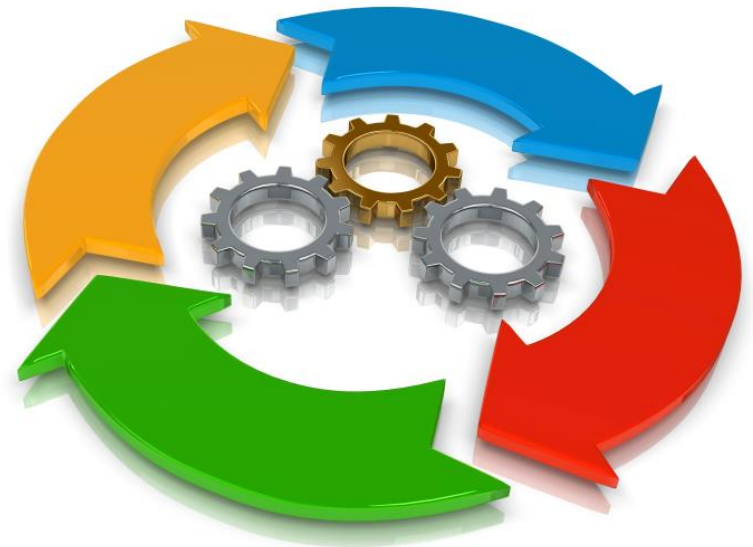
# Painting a Picture

- Identify the gaps
- Determine what technologies are required
- Develop and enhance those technologies
- Adopt technologies
- Focus on continuous improvement



# The Process

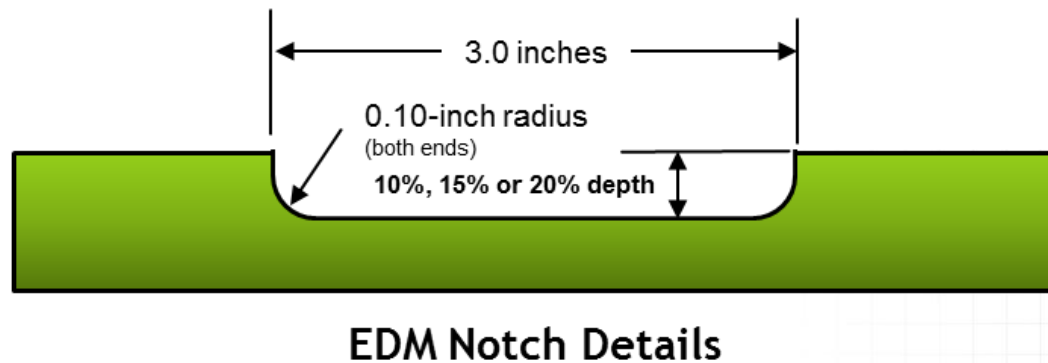
- Inspection
- Validation of inspection data
- Making challenging decisions
- Repair, rehabilitate, or resume



A case study: *Testing Cracks*

# Sample Fabrication

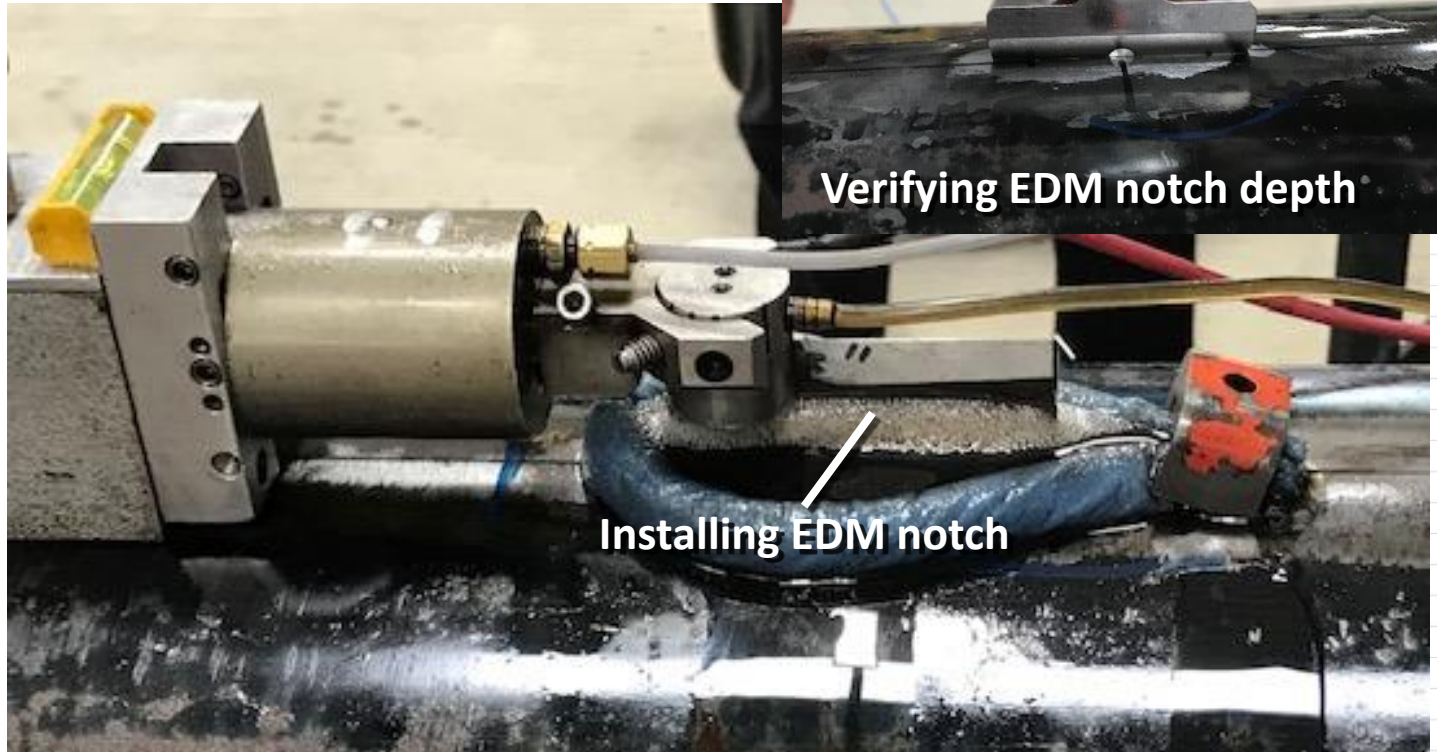
(typical EDM notch geometries)



Work being done in partnership with:







Verifying EDM notch depth

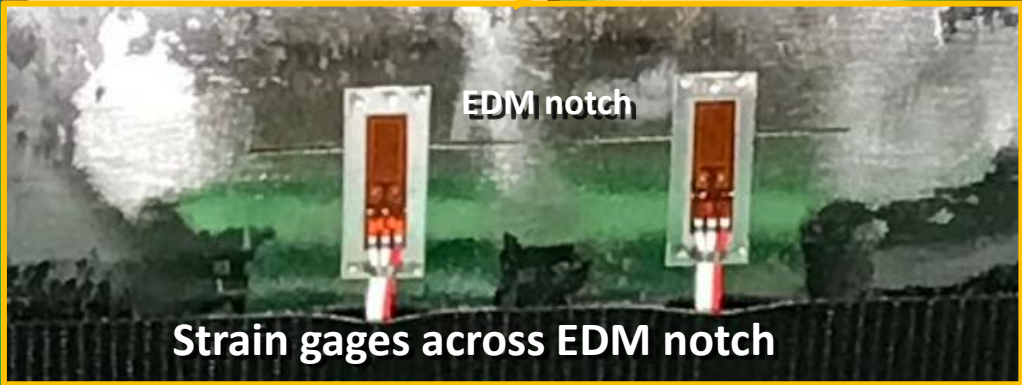
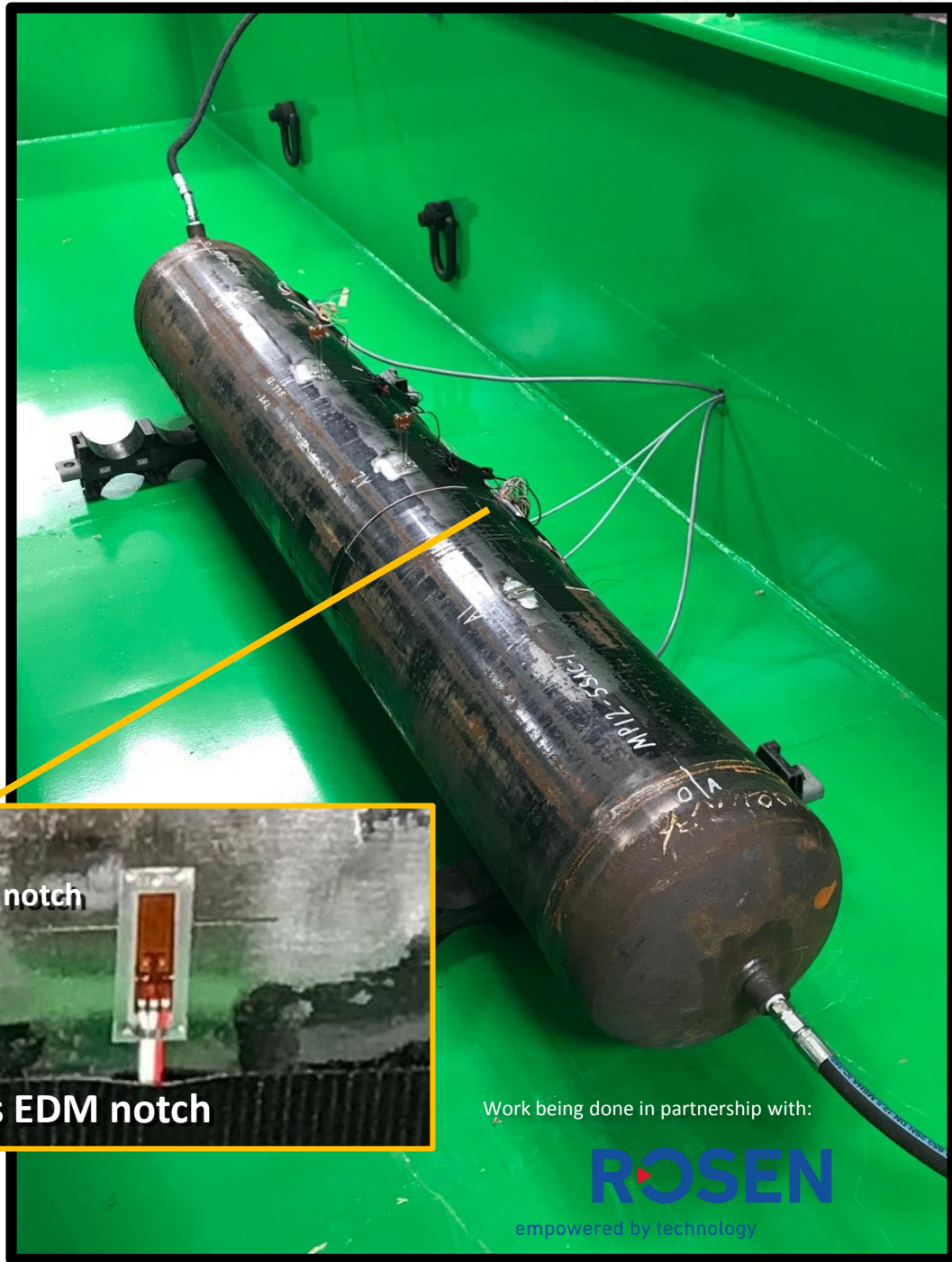
Installing EDM notch

Work being done in partnership with:



empowered by technology





EDM notch

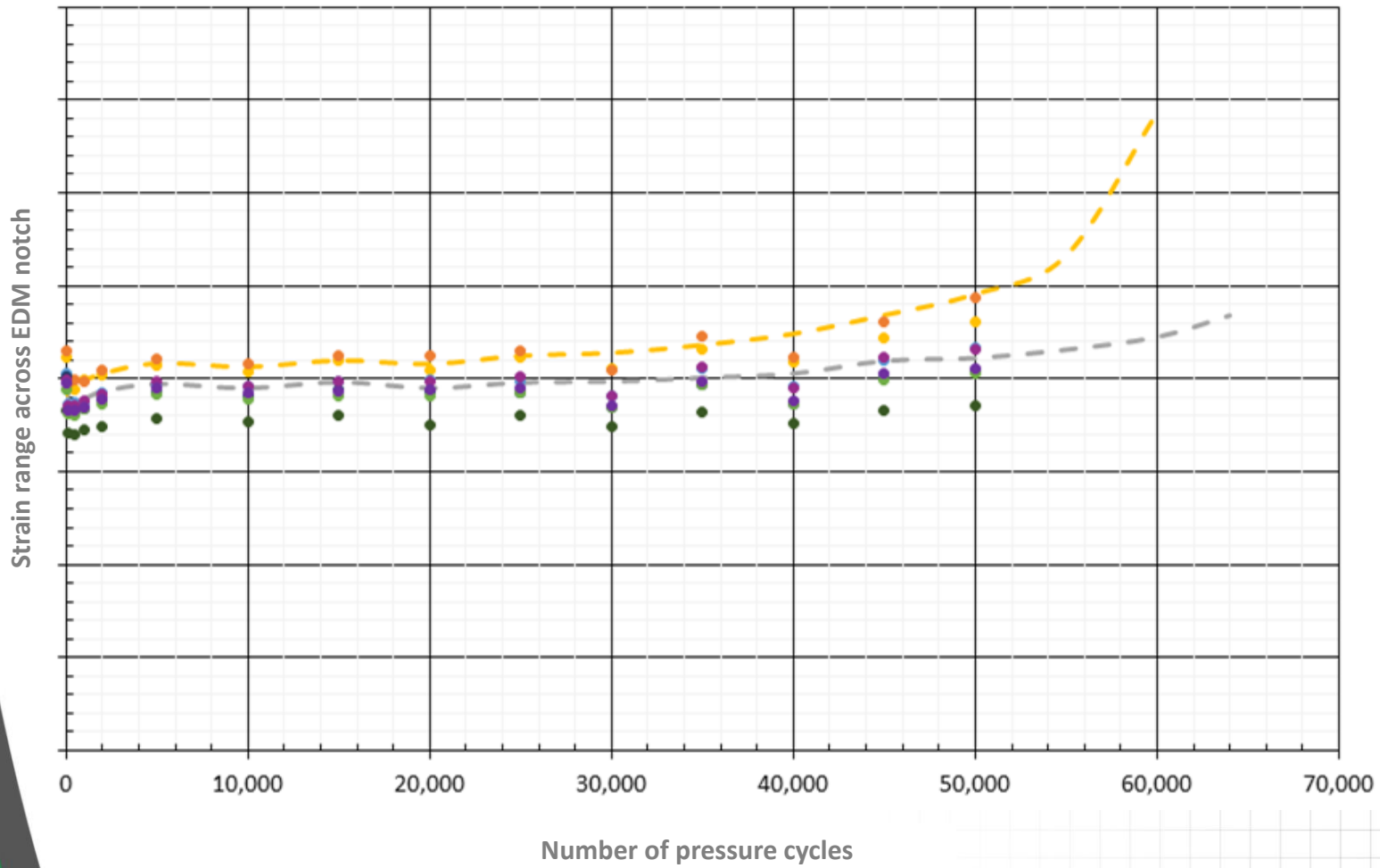
Strain gages across EDM notch

Work being done in partnership with:

**ROSEN**

empowered by technology

# EDM notch strain vs. cycle #

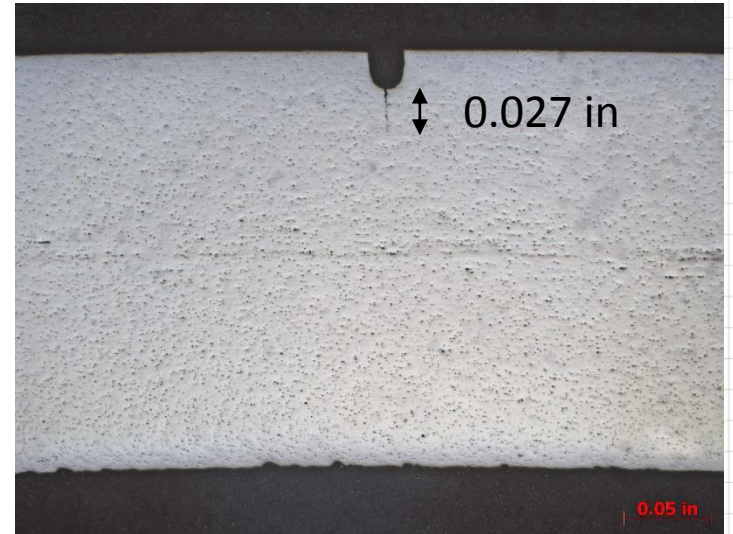


Work being done in partnership with:





- Notch Width: 0.016 inch
- Notch Depth: 0.022 inch
- **Crack depth: 0.027 inch**



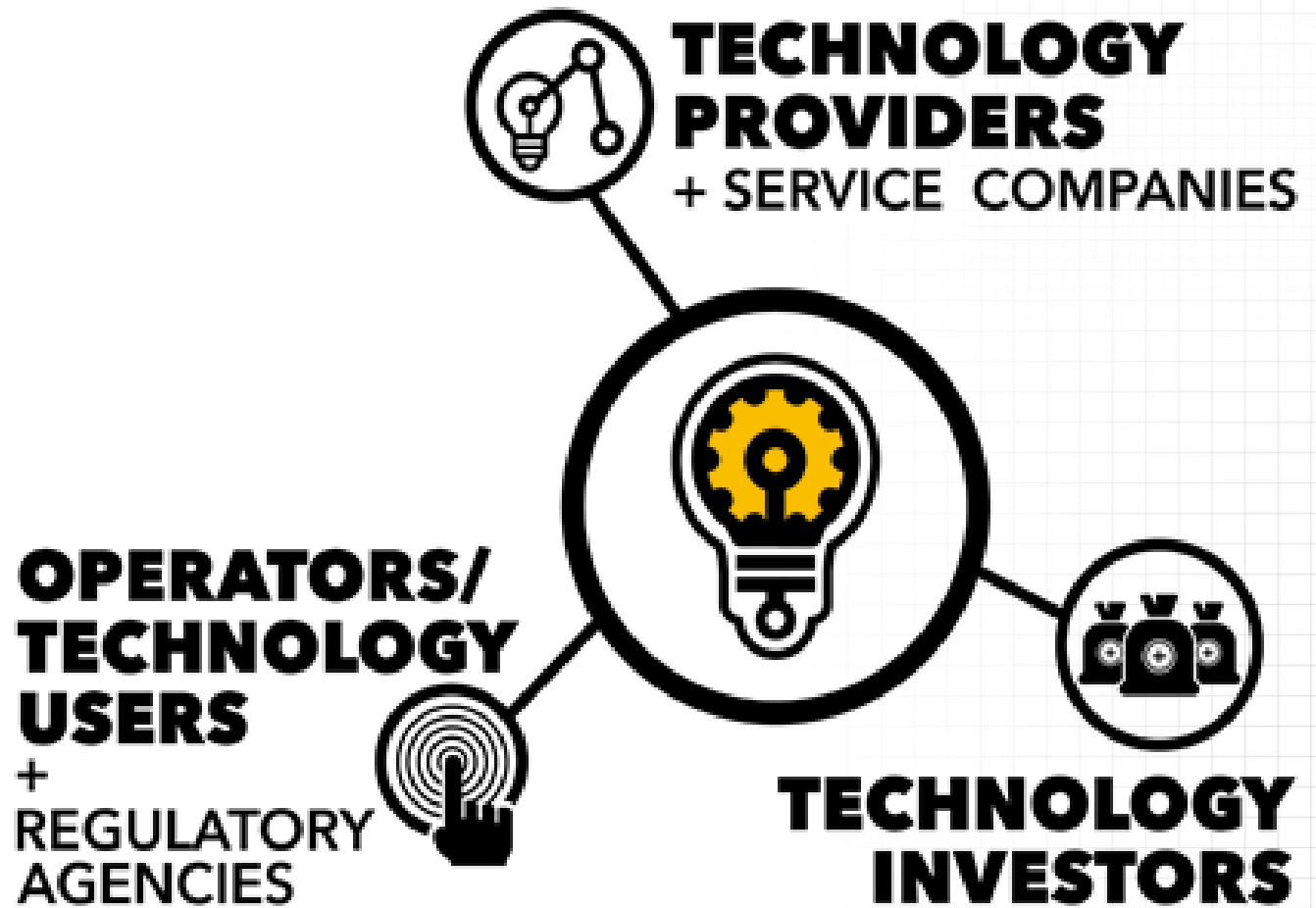
## Sample notch and crack

Work being done in partnership with:

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# Our role in the process...



# A Few Parting Thoughts

- Look for the gaps
- Let's collaborate and work together
- Be innovative
- Be nice to the innovators (we need them)
- Have a willingness to try new approaches



ADVANCING INDUSTRY TOGETHER



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