

# ENGINEERING

CHANGE

LAB



## Mark Abbott, P.Eng., MBA

- UBC Mechanical Engineering
  - Consulting Engineering (14y)
  - SFU Executive MBA
  - Engineers Without Borders (4y)
  - ECL Canada (6y)
- ★ Colette, Felix (6) and Stella (3)

[markabbott@engineeringchangelab.ca](mailto:markabbott@engineeringchangelab.ca)

# Engineering Licensure Provocations

Critical moment for engineering and engineering licensure:

1. Need for more **critical reflection** about the role of engineering in society
2. Need for greater **collaboration**, but only engineers care about “engineering”
3. Need to **navigate value tensions** to avoid both Focused Obsolescence or Expansive Disintegration

<b>ITEM</b>	<b>CAN</b>	<b>USA</b>	<b>Can/US</b>
Population	37,600,000	328,200,000	11.5%
Licensure Model	Self Reg.	State Reg.	
Licensed Engineers	170,000 P.Engs 0.45% ( <u>2017 Eng Can</u> )	450,000 PEs 0.14% ( <u>2017 NSPE</u> )	38%
Practicing Engineers	?	?	

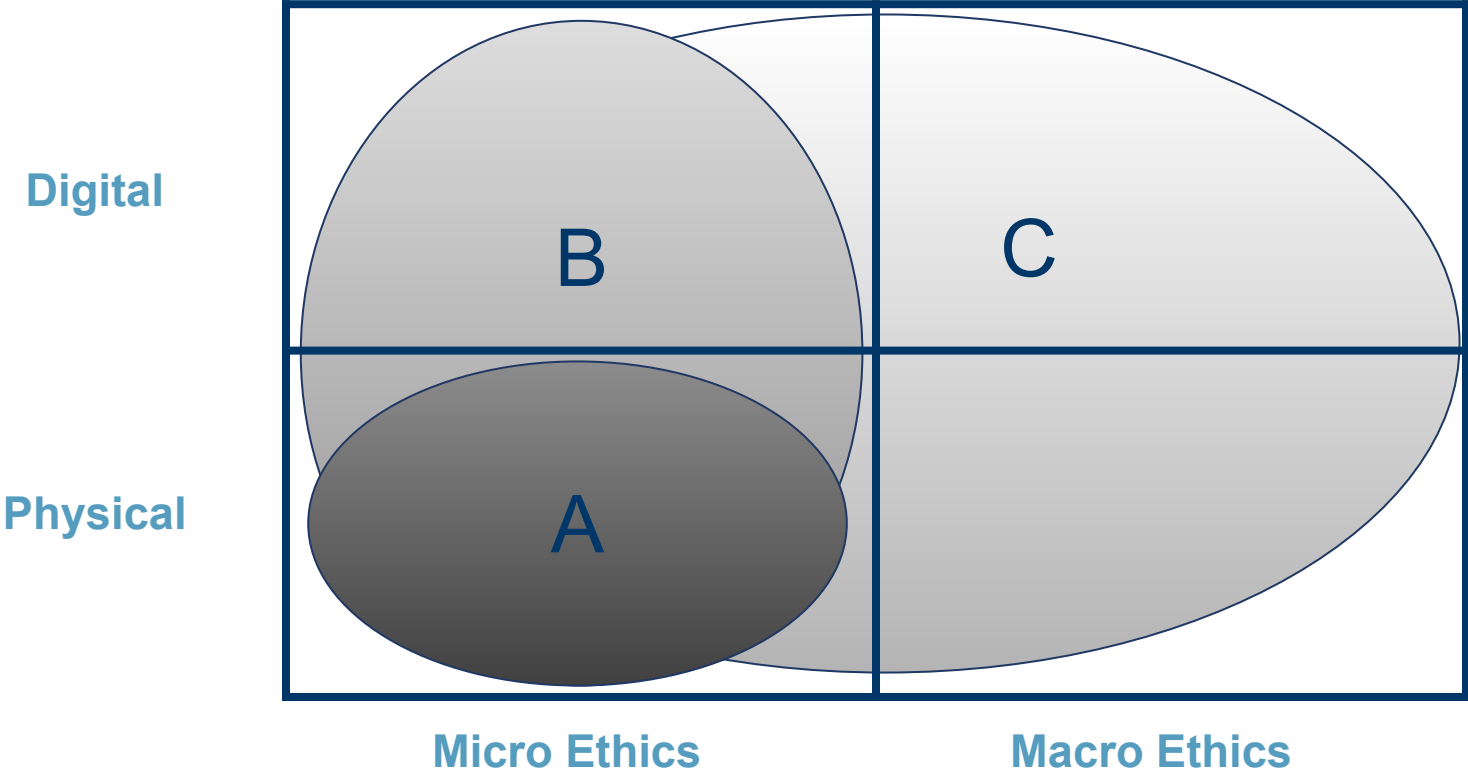
Canada licensure dominated by built environment & consulting engineers

Also 1st & 2nd Industrial Revolution based engineering

# Professional Engineers Ontario (PEO) Volunteer Leadership Conference

Help enhance PEO's ability to  
**protect the public interest** within a rapidly  
changing world by supporting the development  
of a **longer-term vision** for the organization

# Exploring The Range Of Possible Responsibility



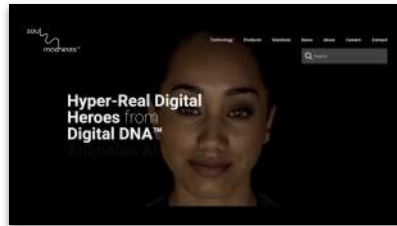
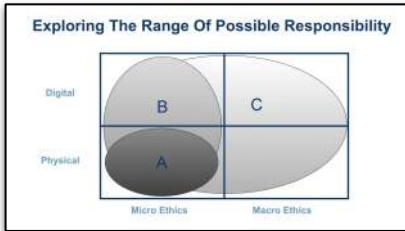
# PEO Volunteer Leadership Conference Sessions

## Session 1: Exploring Scenarios

## Session 2: Case Study

## Session 3a: Headline of the Future

## Session 3b: Action Planning



### Professional Engineers Fight For Data Privacy

Date: June 12th, 2030

A highly publicized case came to a close today as XYZ Industries was found guilty of the wrongful dismissal of professional engineer ABC. XYZ was makers of educational software for K-12 students, and their software design work falls under PEO's practice standard regarding Child and Student Data Governance, which is based on an IEEE international standard. ABC was fired when she refused as a professional engineer to modify the design of their software in a manner that would significantly circumvent the intent of the standard. Based on a PEO investigation, the company's certification of authorization was revoked, a decision that contributed to today's landmark court decision.

**Statistics:**  
80% of data-driven businesses with significant operations in Ontario have committed to PEO's practice standards, which are fast defining the new normal level of care.

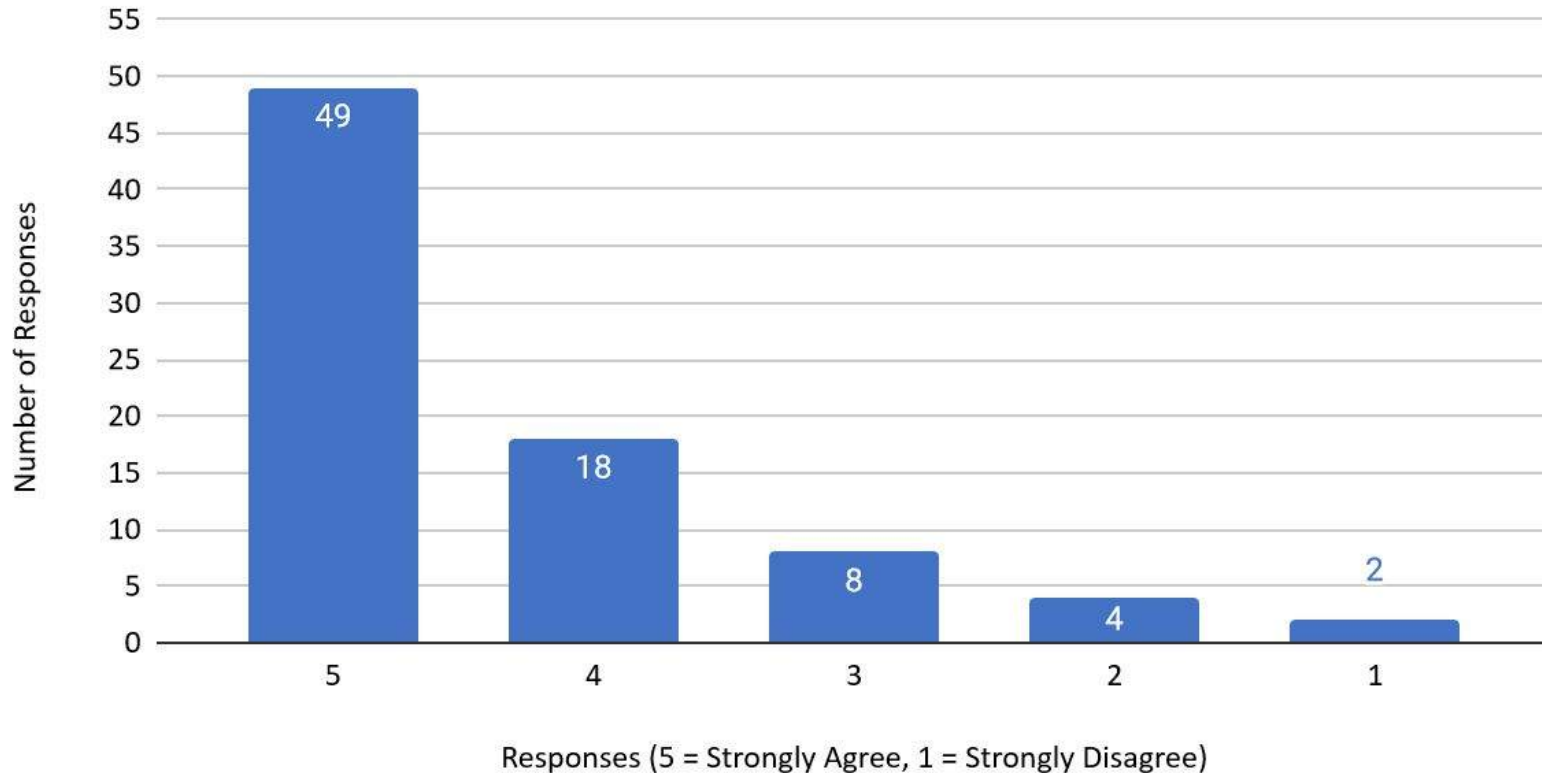
*"As Professional Engineers we must stand together and not be afraid to wade into complex ethical questions in our efforts to protect the public interest."*

2030 PEO Registrar

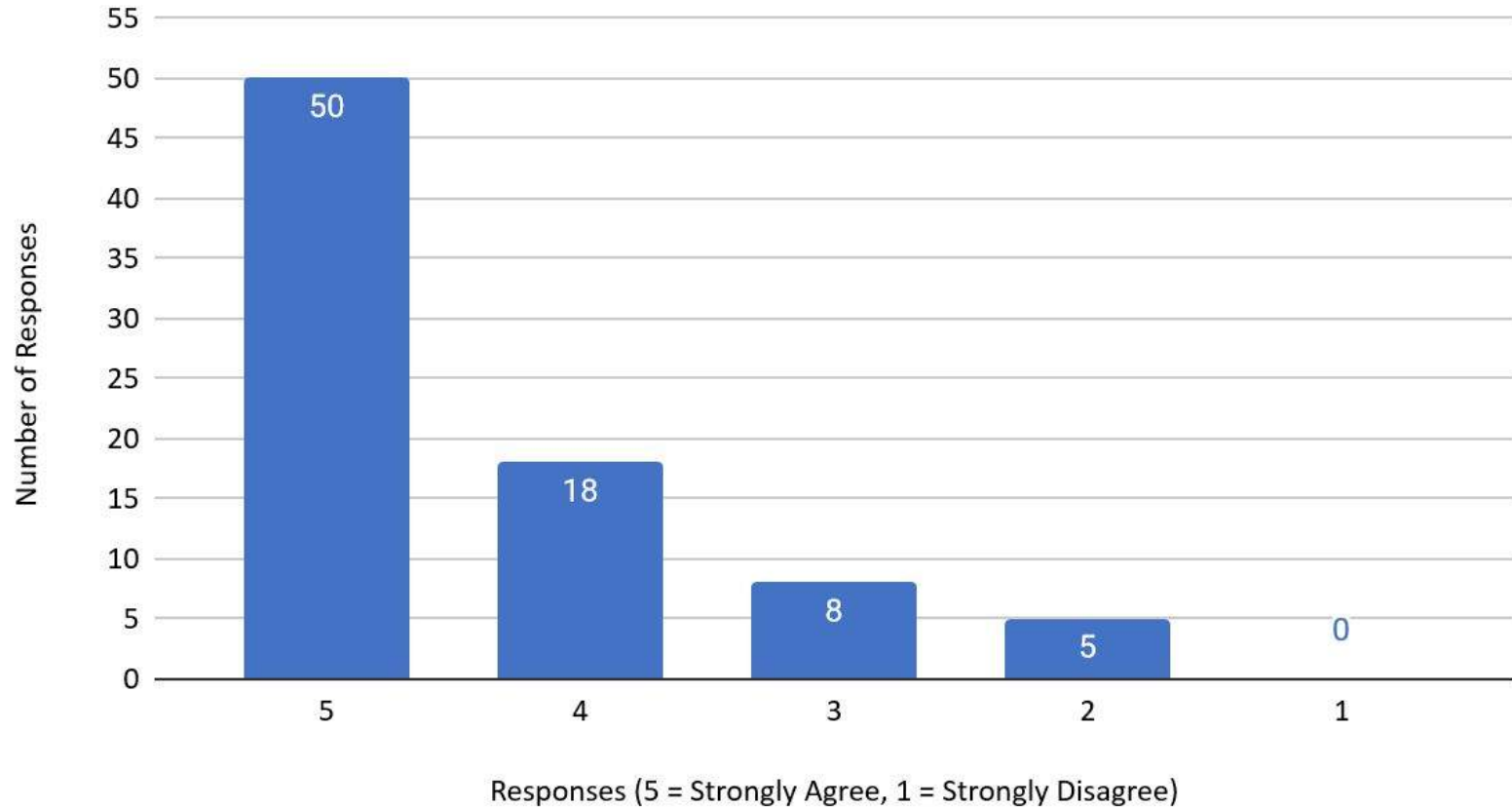
### What actions can PEO take?

Near Term	Medium Term	Long Term

It is important that PEO's vision addresses the creation and application of digital technologies.



It is important that PEO's vision addresses macro ethical concerns.





# PEO VLC Key Takeaways

- The majority of volunteer leaders believe PEO's vision must fully tackle **digital and macro ethical concerns**; however, there is a broad range of opinions, including a minority group holding the opposite opinion.
- There is a widely held appreciation of the rapid pace of technological change and a sense that PEO is falling behind. A new vision must help PEO to **remain relevant and provide infrastructure** for ongoing critical reflection and evolution.
- A majority stressed the opportunity for **more collaboration with key stakeholders**, and many also stressed the need for **stronger public engagement**.

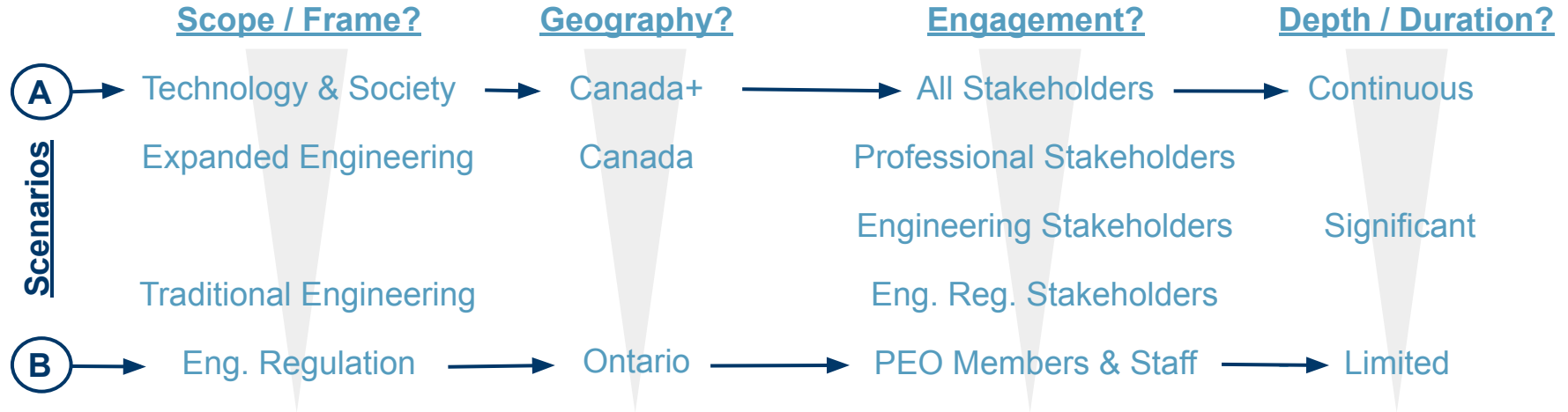
## #2) Collaboration - only engineers care about engineering

**Technology** is the means by which humans adapt our environments to meet our needs or wants.

**Engineering** is the process of creating and maintaining artifact based technologies

**Engineering community** is the group of people who contribute to and support the engineering process

# Range of Approaches for Visioning Process



### #3) Navigating Value Tensions (Polarities)

1. Depth AND Breadth
2. Stability AND Change
3. Org Health AND Org Impact
4. Specialist Expertise AND Lived Experience



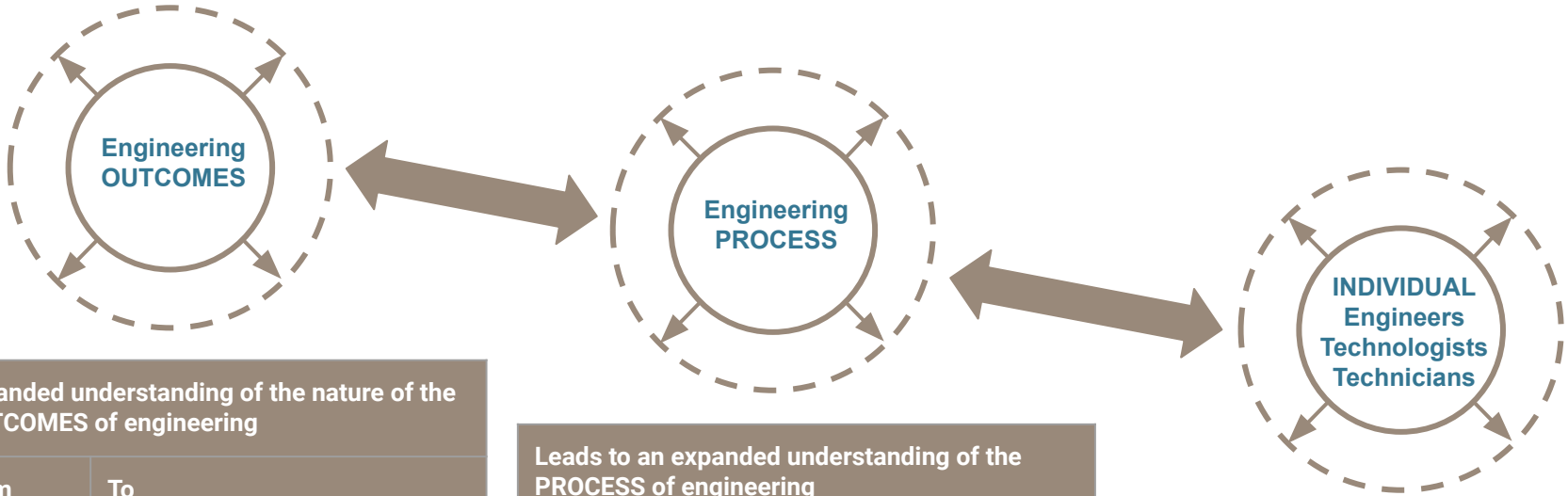
**What is possible AND What is necessary**

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# Increased Benefit For All: a world that is more equitable, inclusive, just and sustainable



Expanded understanding of the nature of the OUTCOMES of engineering

From	To
Neutral	-> Value Laden (not Neutral)
Artifacts	+ Social Construction

Leads to an expanded understanding of the PROCESS of engineering

From	To
Right Answer	-> Best Answer (not Right)
Specialized	+ Integrated + Democratic
Micro	+ Macro
Analytical	+ Critical

Leads to an expanded understanding of the contributions of INDIVIDUALS

From	To
Default narrow interpretation of Graduate Attributes and Professional Competencies	More fulsome interpretation <b><u>founded on critical reflection about the role of engineering and its outcomes.</u></b>