

Practical Steps Toward Digital Transformation

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Lead, Digital Transformation

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Hello!



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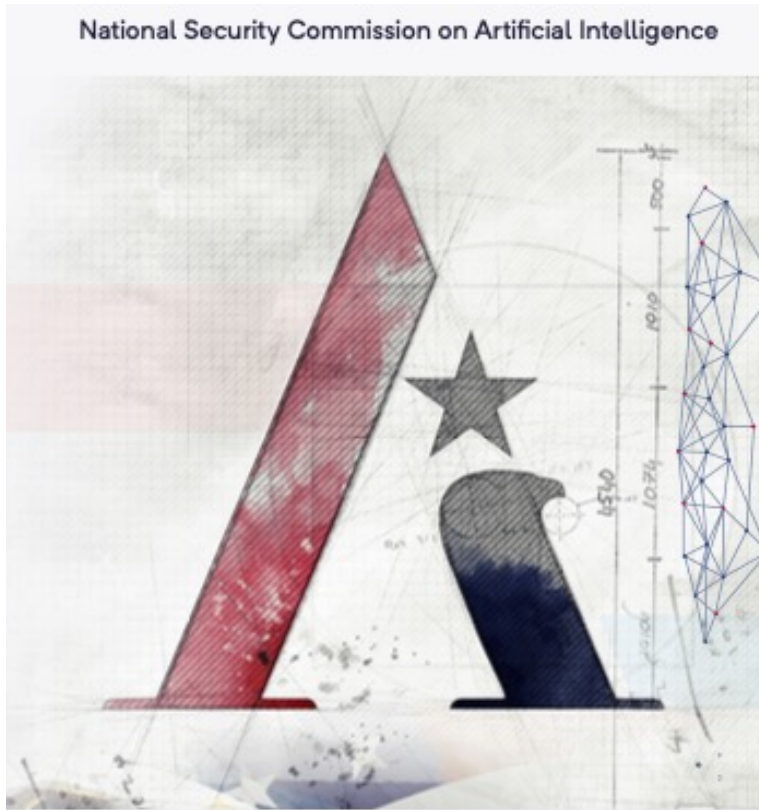
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Digital transformation is the adoption of digital processes and tools to achieve stakeholder-driven outcomes.

What kind of world do you want to design?



March 1, 2021

“This new era of competition promises to change the world we live in and how we live within it. We can either shape the change to come or be swept along by it.”

Pentagon is planning to spend **\$874 million** on artificial intelligence (AI) and machine learning technologies next year.

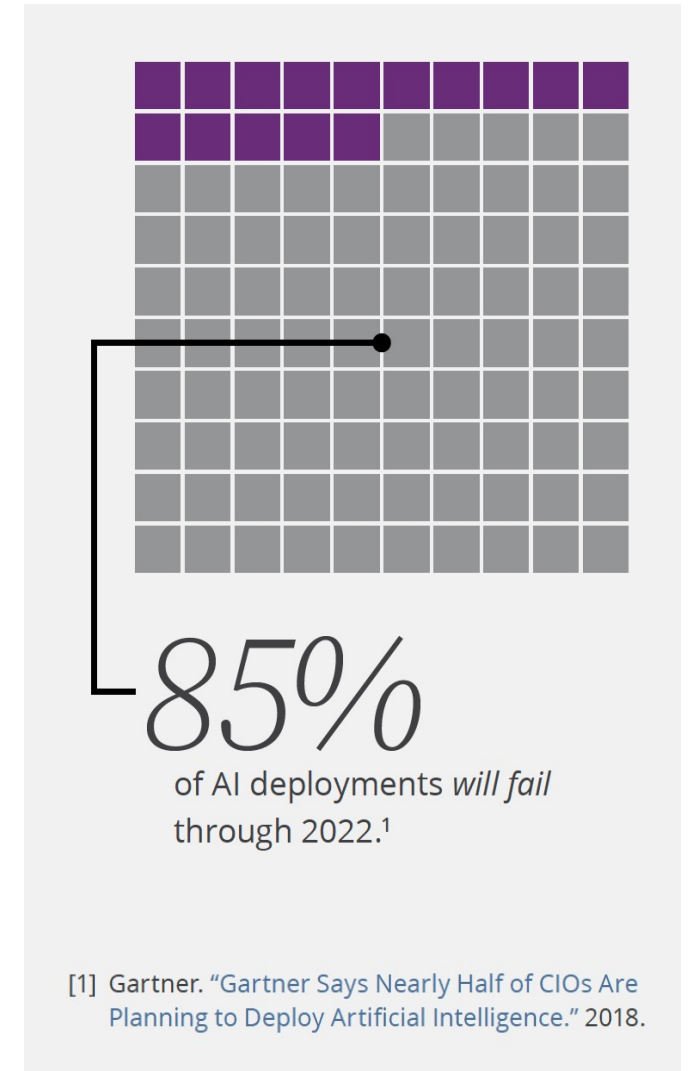
How do we ensure returns on the investment?

Organizations realize that AI holds great promise and power.

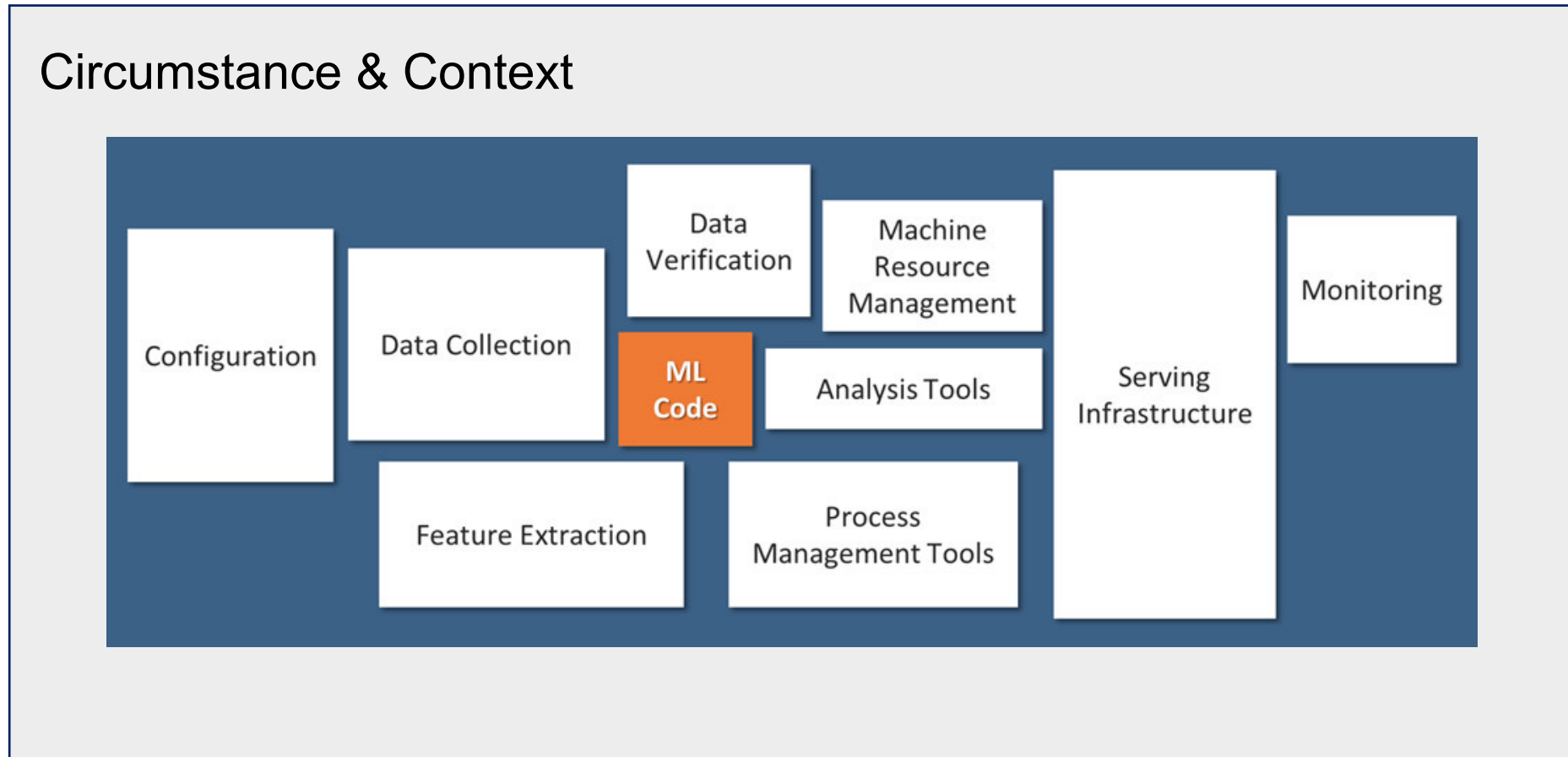
It is hard to get AI right.

Many organizations aren't prepared and don't have the needed expertise.

Most work is a race to AI capability.



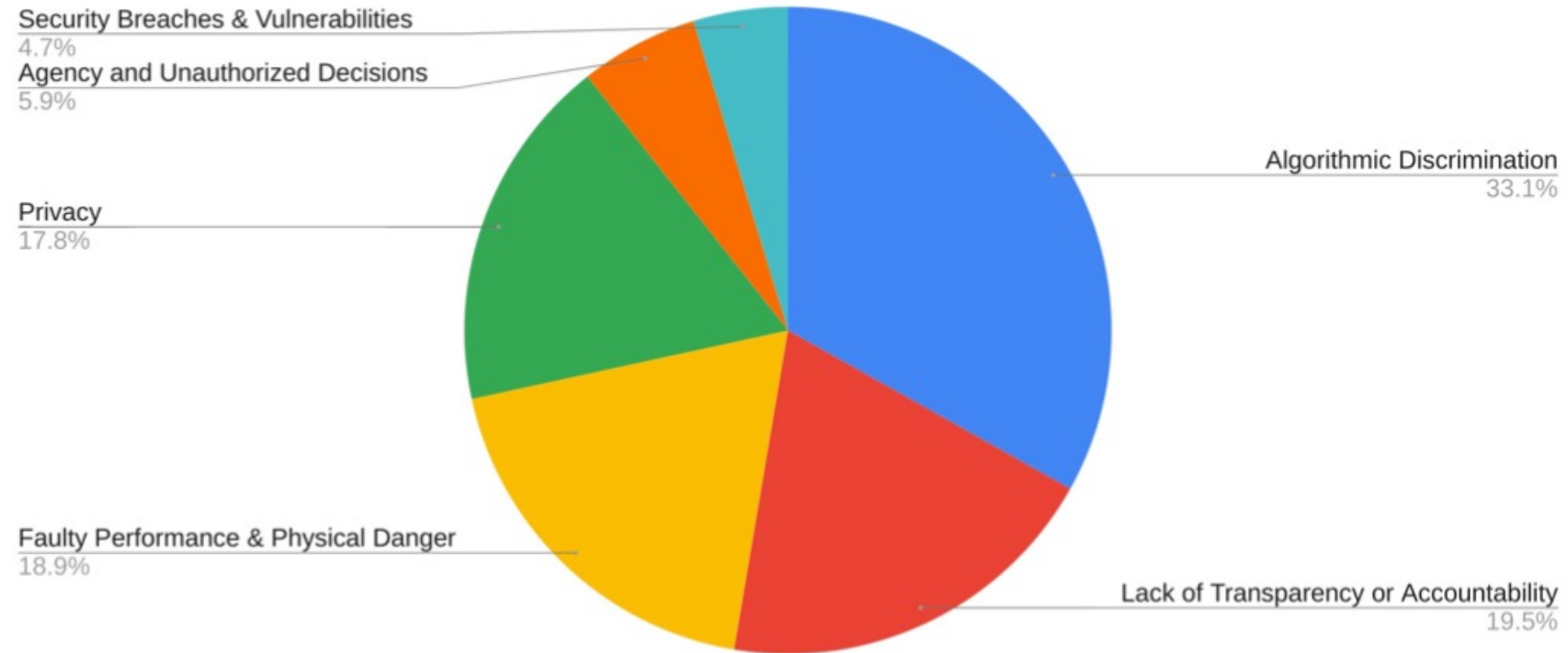
The goal of the SEI AI division is to help the DoD build competence and know-how around implementation of AI systems.



D. Sculley 2018

Survey of 169 publicly-reported* AI Incidents

95% were **unintentional** failures.



*** Incidents occurred between 1988 & 2021 and were covered by public media. This work was done in collaboration with BNH.**



What stops organizations from adopting AI?

- Unclear implementation context
- Unspoken disagreement among top managers about goals
- Too many priorities
- A divide between the digital capabilities supporting the pilot and the capabilities available to support scaling it
- The effects of technology are multi-faceted and diffuse, and doesn't just involve technology.

Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., & Buckley, N. (2015). Strategy, not technology, drives digital transformation. *MIT Sloan Management Review and Deloitte University Press*, 14(1-25).

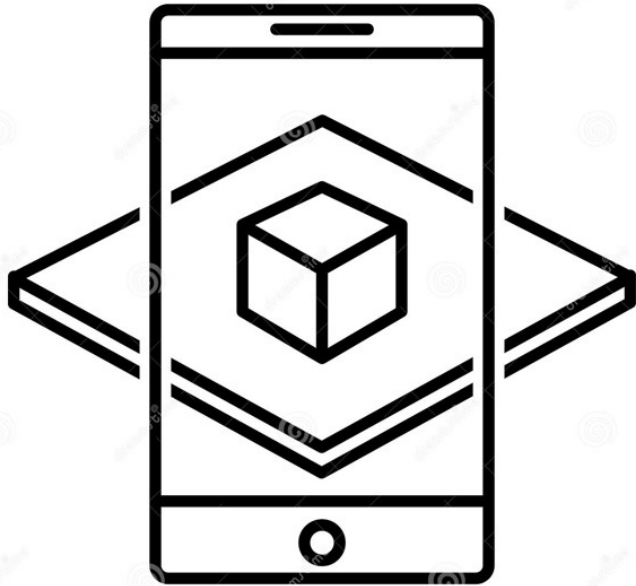
Technology adoption requires us to deeply understand stakeholder and user experiences.





Despite how much data we have today, surfacing desired outcomes remains a major challenge.

AI and all emerging technologies are going to continue to change rapidly.

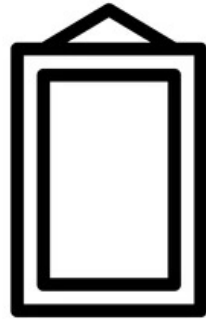


Organizations today must focus on a customer experience (or transformation) that they wish to create, and then fluidly adopt or employ technologies that allow them to create those experiences.

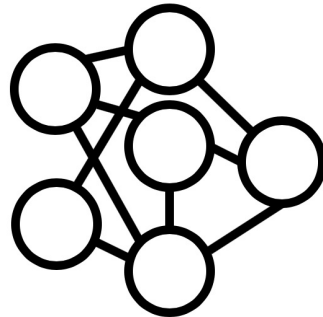
What is needed to guide digital transformation?



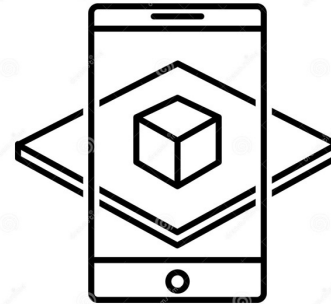
Awareness



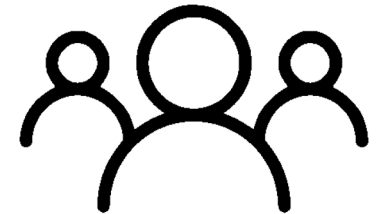
Problem Framing



Systems
Mindset



Experimentation

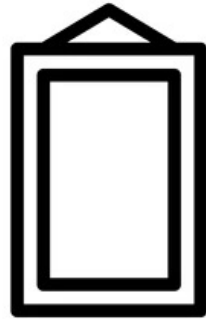


Teaming

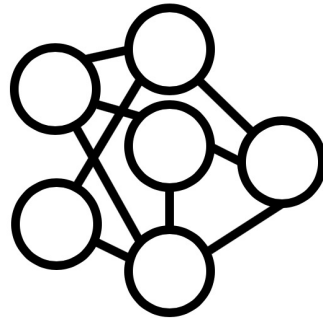
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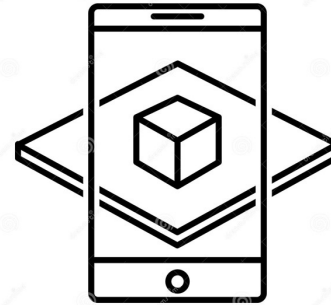
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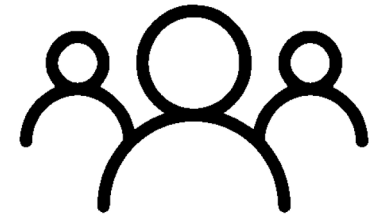
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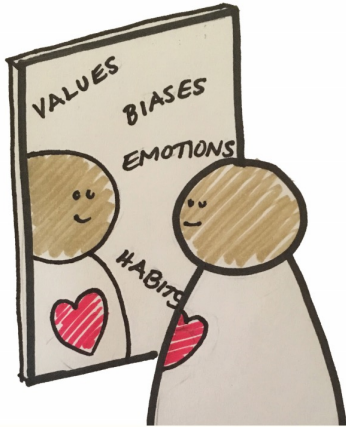
Teaming

Awareness of context.

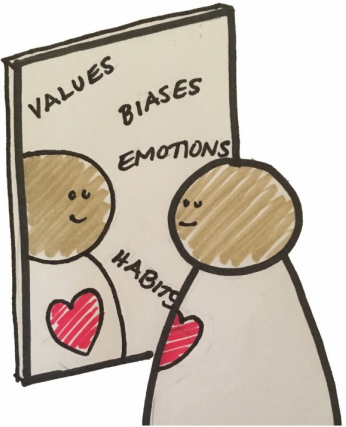
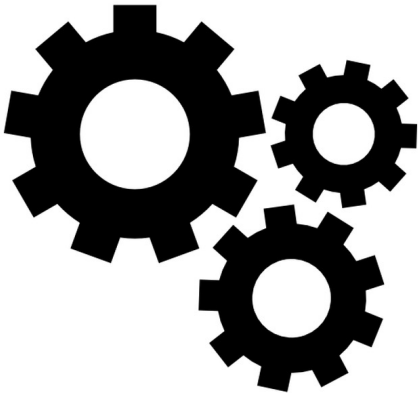
It is about simple awareness — awareness of what is so real and essential, so **hidden in plain sight** all around us, that we have to keep reminding ourselves, over and over: “This is water, this is water.”



Awareness of self.



Creator



User

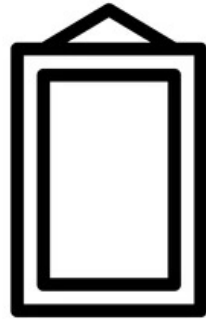
Practical steps for awareness building:

- Bring the customer into the room
 - What are their circumstances?
 - How could we cause undue harm?
- Develop processes for stakeholder & contextual understanding
 - Think small.
- Schedule a meeting to document design decisions and reflect on *why* they were made

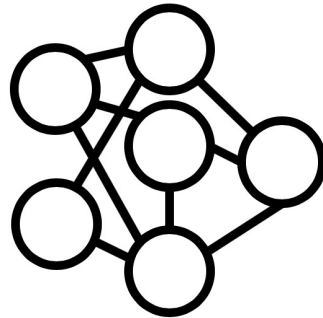
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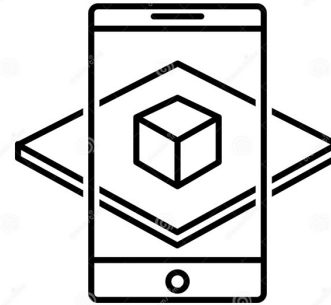
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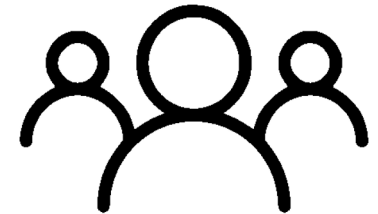
Problem Framing



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Teaming

At the heart of digital transformation is the ability to frame and reframe the problem to be solved.



Laddering Up and Down

What is the fate of the universe?
- Saul Perlmutter



Developing Human-Centered AI

One of the most powerful influences on an ML system is how the team defines the objective function or system purpose.



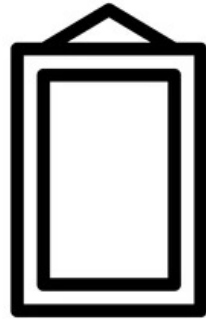
Practical steps for problem framing:

- Assign someone to be the problem “gut check” on a team
 - What is the problem we’re solving?
 - Is there a person embedded in our statement?
 - Are we carrying the frame into the solution space?

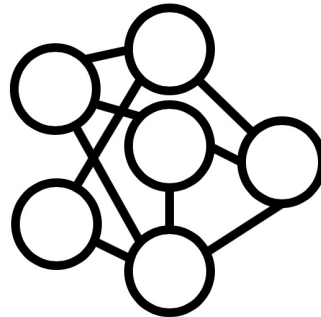
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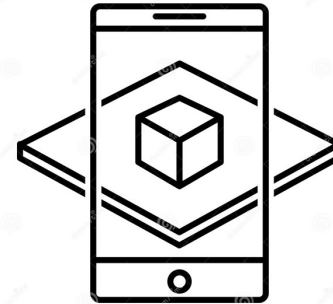
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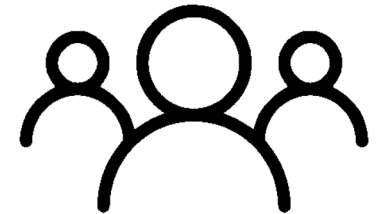
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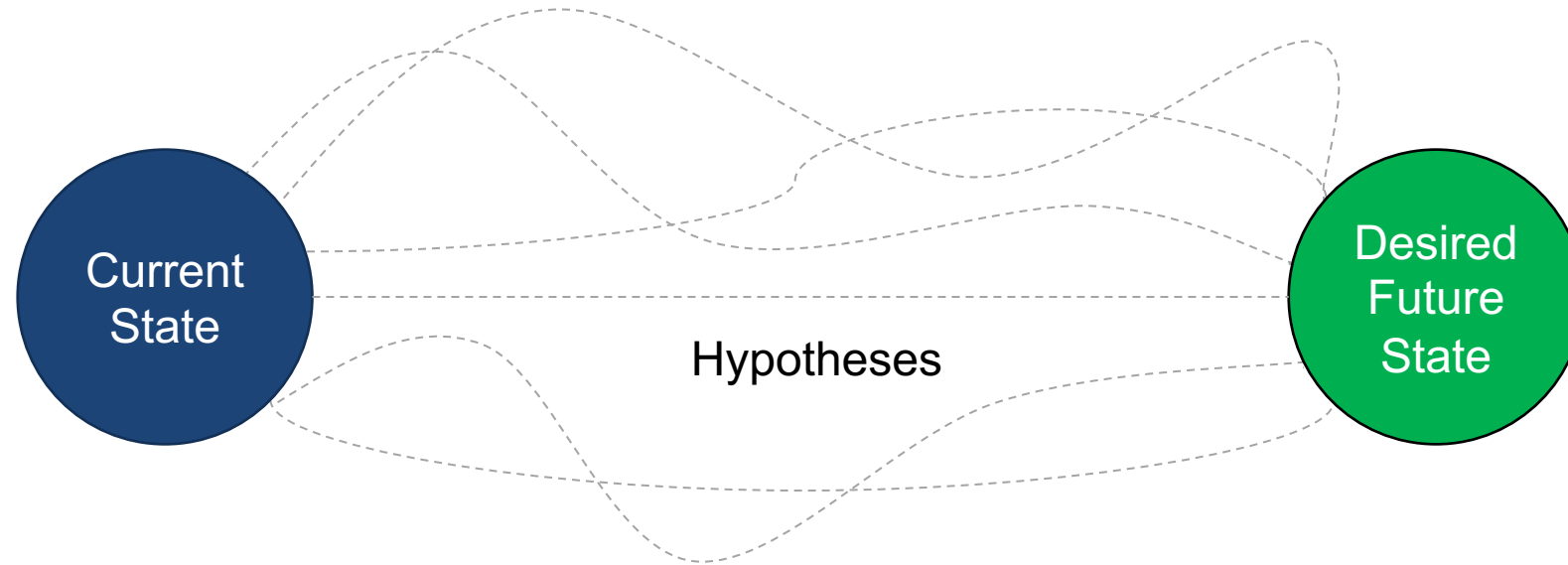
Experimentation



Teaming

Testing Systems Change Hypotheses

How to Get from Nothing to Something



Beckman & Law 2021

Testing Systems Change Hypotheses



Beckman & Law 2021

Testing Systems Change Hypotheses

What risks are you mitigating?

MVP Minimum Viable Product

MLP Minimum Lovable Product

MEP Minimum Explainable Product

RAT Riskiest Assumption Test

Beckman & Law 2021

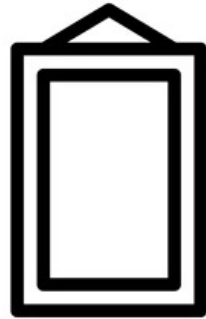
Practical steps for experimentation:

- Define the riskiest assumptions embedded in your system
- Focus on testing one component at a time
- Test what is needed, not what is easy
- Have a plan for outcome measurement
- Be aware of limitations of the approach and have a plan to manage them.

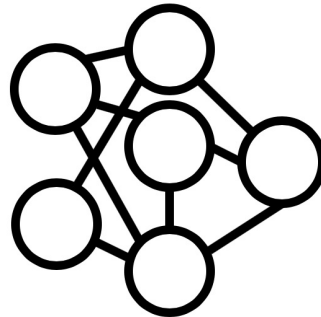
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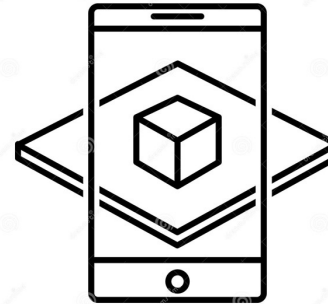
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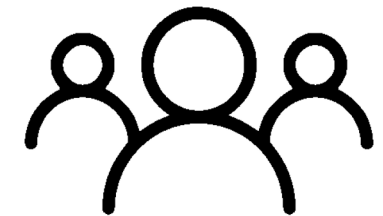
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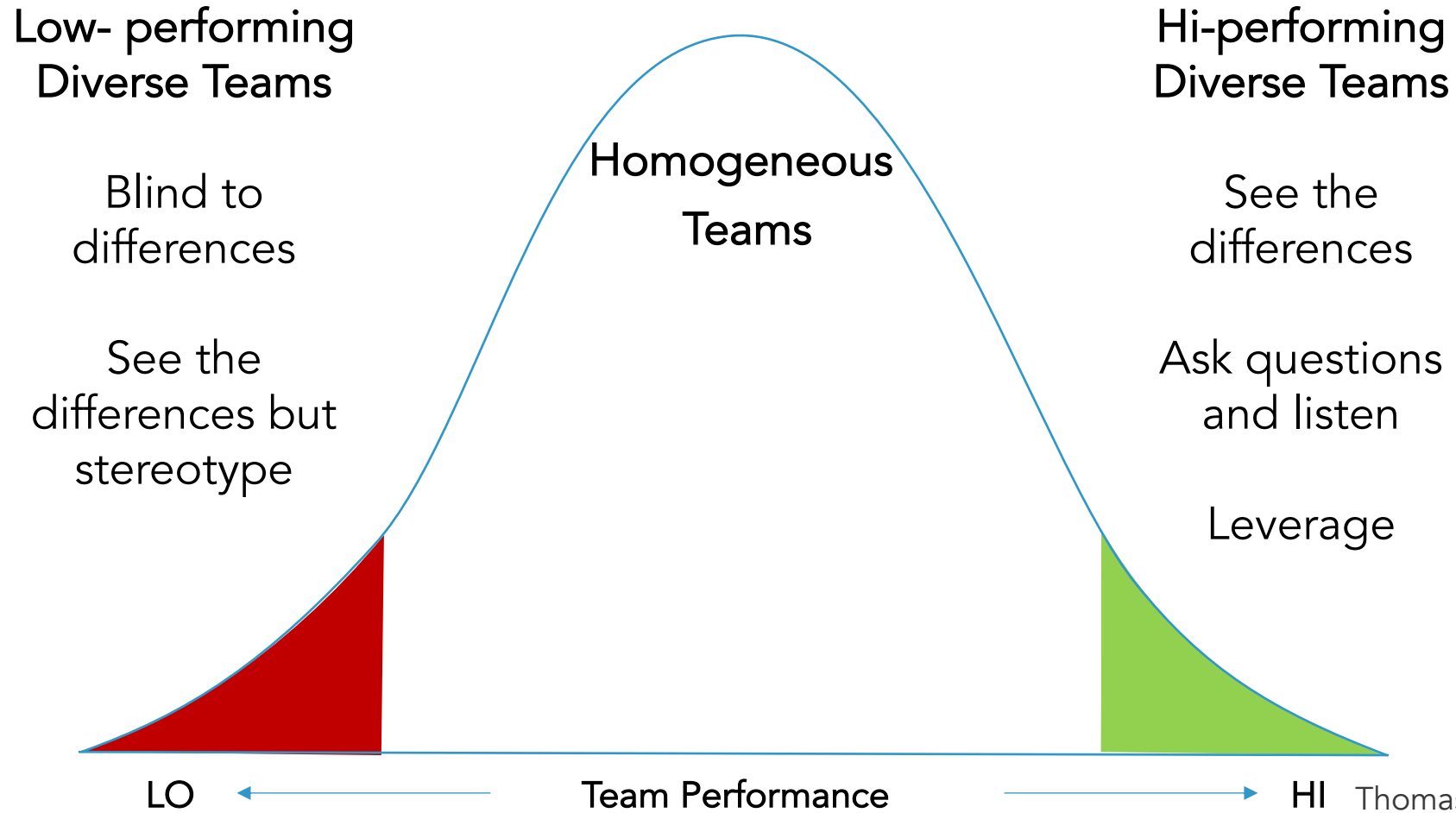


Teaming

At its essence, every organization is a product of how its members think and interact.

- Senge, Kleiner, Roberts, Ross & Smith
The Fifth Discipline Fieldbook

diverse teams don't always perform well!



Thomas, D. A., and Ely, R. (1996)

Purpose

- Success is defined by bigger goals, rather than narrow agendas
- Goals are simple and concrete, and foster a sense that “We’re in this together”
- Goals are customer-focused and consistent with organizational values
- The goals of each team member align with the team’s goals

Roles

- All team members understand the roles and capabilities of each individual on the team
- Roles reflect personal motivations and skillsets
- There is clarity on how roles connect to work outputs

Coordination

- Team is disciplined, customer-focused, and well-organized
- There is a clear and effective decision-making process
- Progress is actively tracked and consistently communicated

Trust

- Team is a psychologically safe environment in which team members can be open to alternative courses of action & constructive debate
- Work is done on time
- Work is done to high standards

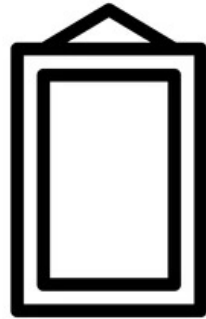
Practical steps for teaming:

- Ask team members about their individual goals
 - How do individual goals connect with the shared goal?
- Give team members a chance to understand each other's background and perspective (to establish psychological safety).
- Employ translators
- Define a process for giving and getting feedback

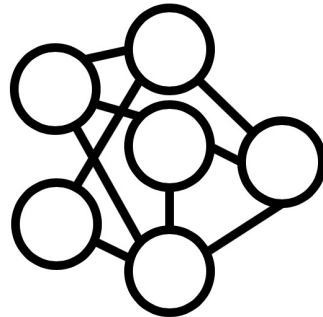
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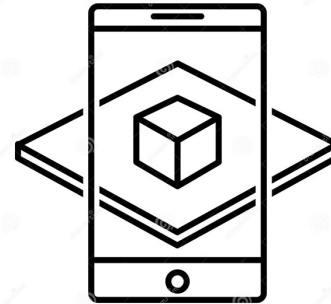
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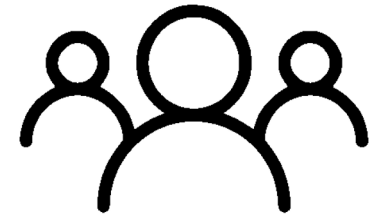
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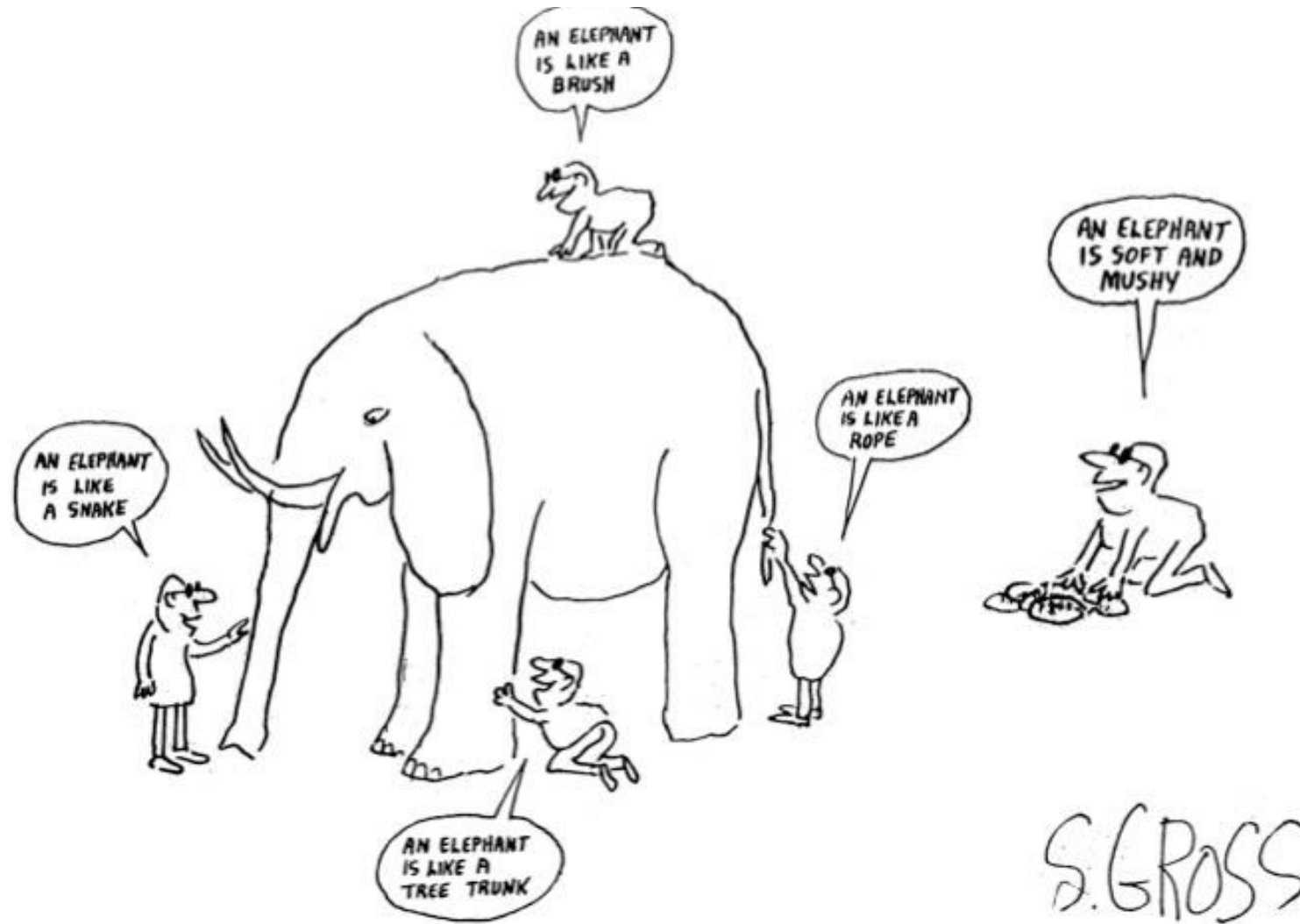


Experimentation



Teaming

A fundamental shift:



The scope of digital transformation

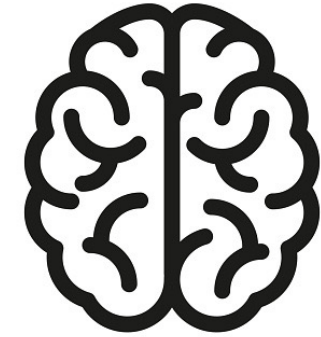


“Clearly, the thing that’s transforming is not the technology — the technology is transforming you.”

- Jeanne Ross, MIT

Core Questions:

- What are you trying to do?
- Why are you trying to do it?
- What's needed to bring the change to fruition?



*“Good intentions never work,
you need good mechanisms
to make anything happen.”*

Reach out: rdzombak@sei.cmu.edu