



# NCSA Industry Overview and Best Practices

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Brendan McGinty

Director

NCSA Industry Program



**National Center for  
Supercomputing Applications**

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

# NCSA Industry History

1986 – Program founded with first industry partner, Eastman Kodak

1992 – First Grand Challenge Award: Eli Lilly

1993 – Caterpillar joins, wins Grand Challenge Award

2004 – Boeing recognized with Grand Challenge Award

2011 – iForge industrial cluster becomes available

2014, 2017 – Winner of HPCwire Top Supercomputing Achievement

2017 – ExxonMobil sets world record with NCSA

- Oil reservoir model: 3 months to 10 minutes, 719000 cores, USD\$1B+ ROI

2020 – Majority of industrial engagement becomes AI-oriented

# NCSA Industry Partners



abbvie

syngenta

MAYO  
CLINIC



Rolls-Royce



ExxonMobil

P&G

HITACHI



CU Aerospace



# NCSA Industry Partners



Hewlett Packard  
Enterprise



DataDirect<sup>™</sup>  
NETWORKS



arm



AMD



tecplot



IBM





# NCSA Industry Partners



The Digital Manufacturing Institute



Compute  
Ontario



**Barcelona  
Supercomputing  
Center**  
*Centro Nacional  
de Supercomputación*



# NCSA Industry Legacy Partners



# Industrial HPC @ NCSA

## MISSION

To provide superior high-performance computing and big data expertise in solving the world's greatest applied challenges

## VISION

Changing the industrial world through advanced computing

## VALUES

**Partner Centric** | Innovation | **Integrity** | Passion

# Engagement Model

## Membership

- ✓ USD\$50000
- ✓ Half price if in UIUC Research Park
- ✓ 5% cost if small business or startup

## Benefits

- ✓ Student/research talent
- ✓ Compute resources
- ✓ Reduced labor and compute rates
- ✓ Meetings to define needs, provide scope, prioritize
- ✓ Research, events, networking



# Engagement Model

## Discover

Initial meetings  
Identify needs  
Define scope  
Set timelines  
Define budget  
Create work plan

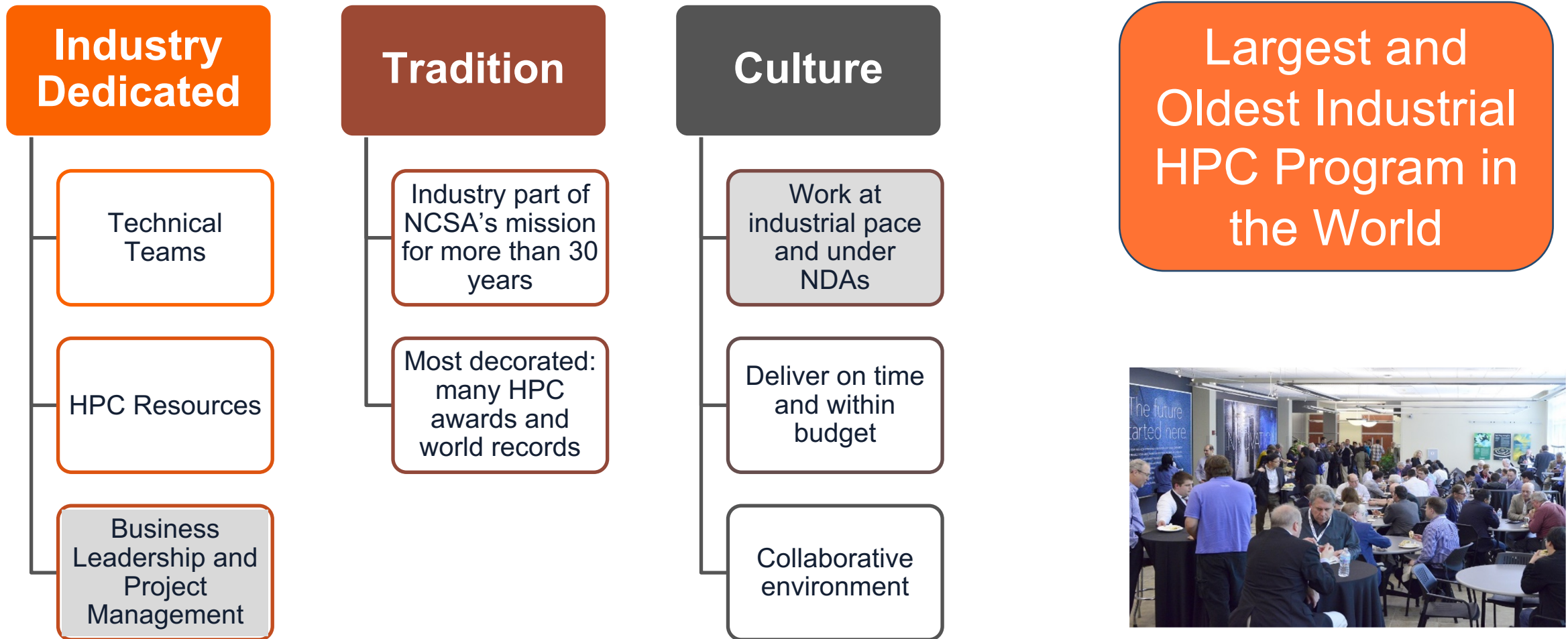
## Build

Design solutions  
Develop  
Test  
Loop as  
necessary

## Deliver

Implement  
Interview  
stakeholders  
Evaluate  
effectiveness  
Calculate ROI

# With NCSA: Six Months Ahead of Competition



# NCSA Industry Technical Team Expertise

Modeling and Simulation

Bioinformatics and Genomics

Data Analytics, GIS, and AI

Code Profiling and Optimization

Rapid User Support and Domain/HPC Training

Cyberinfrastructure and Security

Advanced Visualization

Much more within NCSA, University, Partners



# National Petascale Computing Facility

## World-Class Data Center

- US Dept of Energy-like security
- 88000 ft<sup>2</sup>, 8175 m<sup>2</sup>
- 25 MW of power; LEED Gold
- 400+ Gb/sec bandwidth

## Hosting Benefits to Industry

- Low-cost power & cooling
- 24/7/365 Help Desk
- Adjacent to and aligned with UIUC Research Park
- **We do it so they do not need to**



# “Best” Practices

It is about **talent** first, compute second.

**Visit** them. If they visit, do not overwhelm them.

Listen. Be **consultative**.

Respect **their** time - or lack thereof. It is about their challenges.

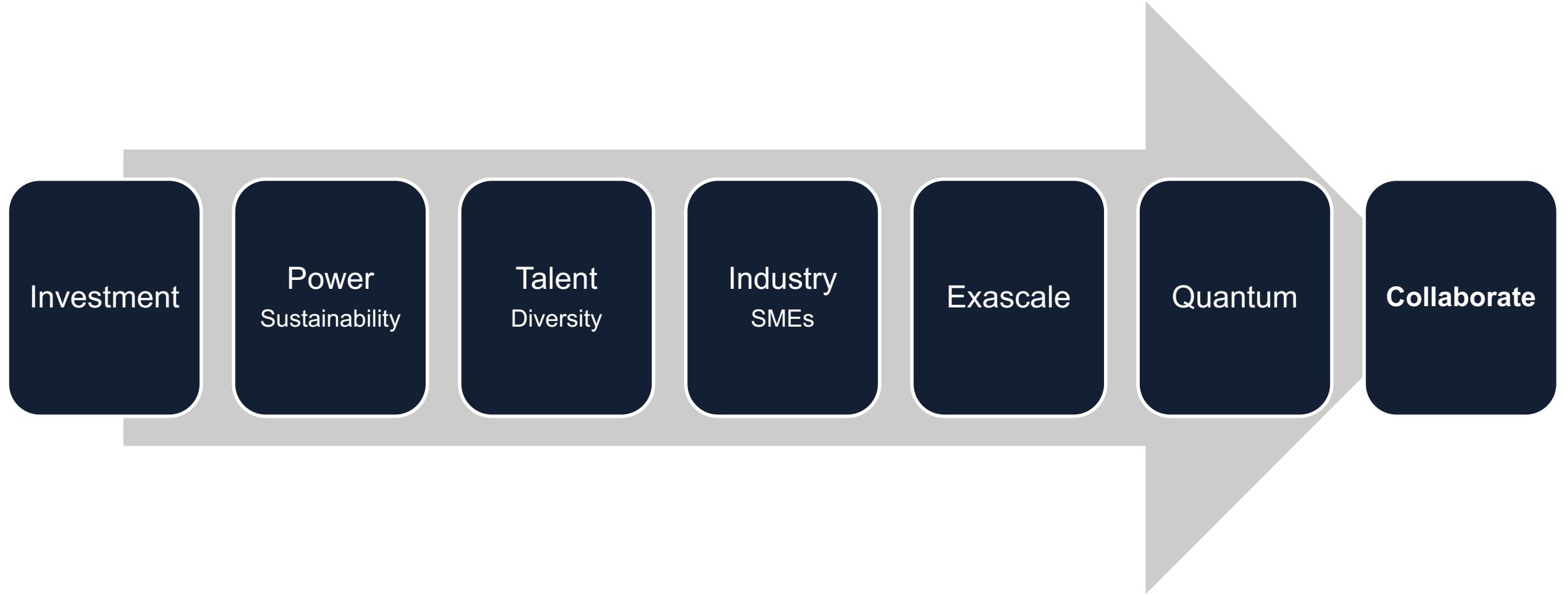
Leverage **resources**: researchers, students, partners, collaborators.

There is enough to go around: opportunities > resources.

Provide **custom** solutions. No two companies are alike.



# Challenges into Opportunities





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[bmcginty@illinois.edu](mailto:bmcginty@illinois.edu)

[linkedin.com/in/brendanmcginty](https://www.linkedin.com/in/brendanmcginty)



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