WELCOME

Industry 4.0

Automated-Connected-Electrified (ACE) Workforce

Information Session

VIRGINIA TECH ENGINEERING

Industry 4.0 ACE (*Automated-Connected-Electrified)* Workforce Team

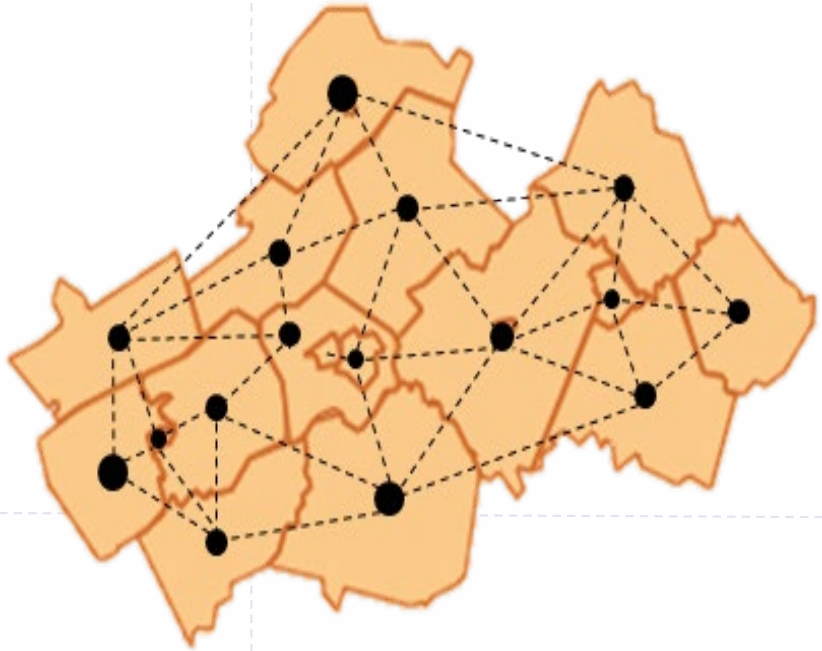
- Pam VandeVord, Associate Dean for Research and Innovation, VT
- Matt Earnest, Director of Center for High Performance Manufacturing, Industrial Systems Engineering
- Scott Weimer, Executive Director of Roanoke Regional Initiatives
- Nicole Akers, Assistant Director for Research and Innovation
- Sally McQuinn, Assistant Director of Roanoke Regional Initiatives
- Jennifer Earley, Region 2 Network Navigator

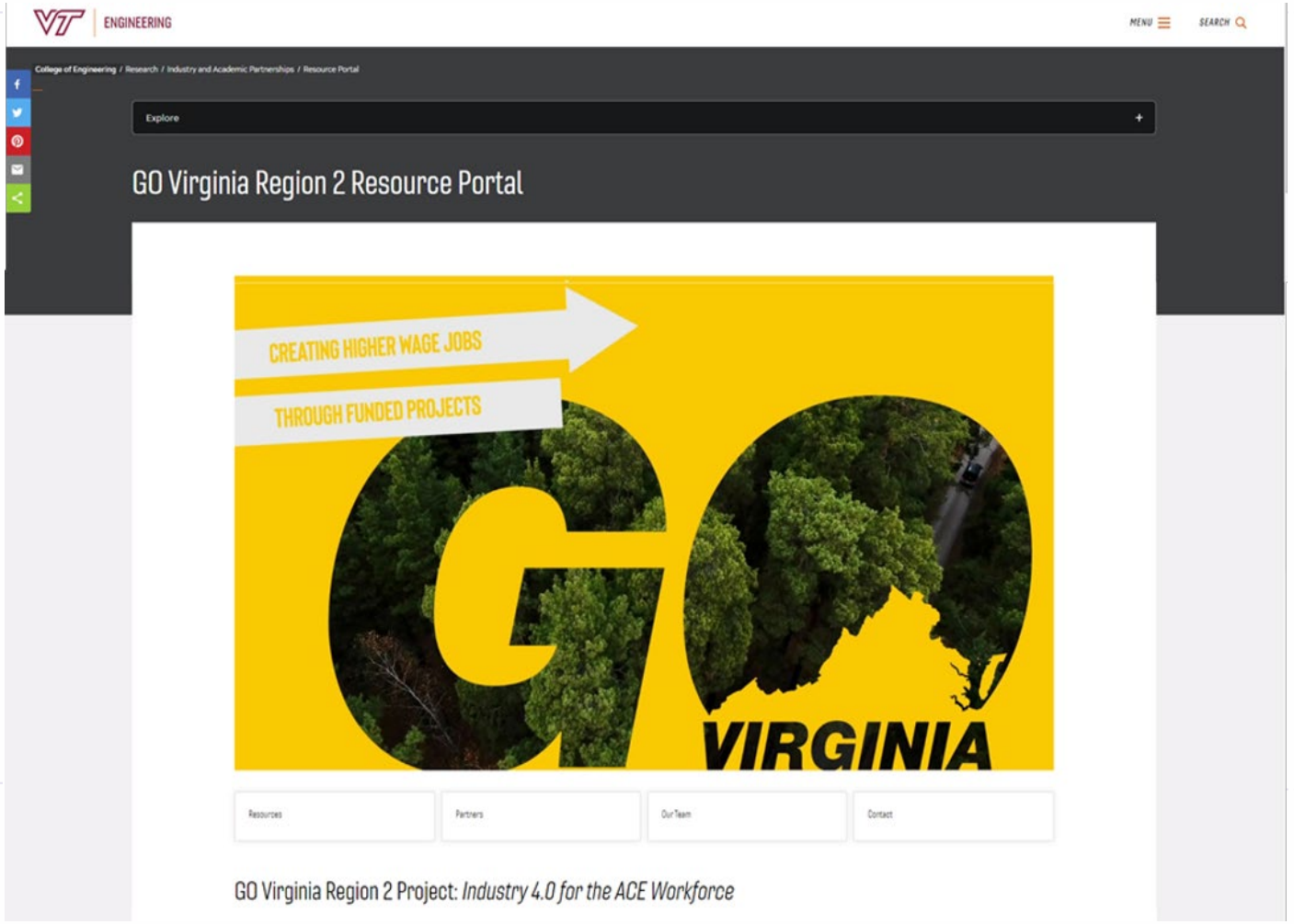
PTAC *(Project Technical Advisory Committee)*

- Ken McFadyen,Botetourt County **PTAC Chair*
- Julia Boas, Roanoke Regional Partnership
- John Capps, Central Virginia Community College
- Jay Foster, Flex Metrics
- Pat Huber, New River Community College
- Tolison Humphrey, HUB Corporation
- James Kong, Virginia Tech
- Chris McDowell, Novozymes, Inc.
- Graham Morris, Volvo Group, North America
- Amy White, Virginia Western Community College

This project was funded in part by GO Virginia, a state-funded initiative administered by the Virginia Department of Housing and Community Development (DHCD) that strengthens and diversifies Virginia's economy and fosters the creation of higher wage jobs in strategic industries.

Link: https://eng.vt.edu/research/industry-and-academic-partnerships/go-virginia-resource-portal.html





Region 2 Focus

GOVA Region 2 Target Industry Clusters

GOVA Industry Clusters (Average wage = $27/hour or $55K annually)			
Transportation and Autonomy ($34/hr or $70K)	**Materials and Machinery Manufacturing ($34/hr or $70K)**	**Life Sciences and Healthcare ($31/hr or $65K)**	**IT and Emerging Tech ($43/hr or $91K)**
• Heavy Duty Trucks • Motor Vehicle Parts • Automation	• Plastics • Rubber • Iron Foundries • Industry Machinery and Tools	• Biopharma & Medical Devices • Residential Care • Eldercare • Medical Diagnostics & Support Services	• IT & Cybersecurity • Electrical Manufacturing • Engineering Services

Together these clusters provide more than 50,790 jobs, or approximately 15% of the total employment in the region as of 2021. Each is expected to see growth in the next 5 years.

Region 2 At-A-Glance

779,837
Total Population

372,365
Total Employment

3.6%
Unemployment Rate

$55,430
Median Income Level

Collaborative Sites and Infrastructure Development

Entrepreneurship and Business Development

Innovation Cluster Scale-Up

Talent Development, Attraction, and Retention

Regional Priority Industry Clusters

*Go Virginia Region 2 Growth and Diversity Plan 2021

ACE Project Overview

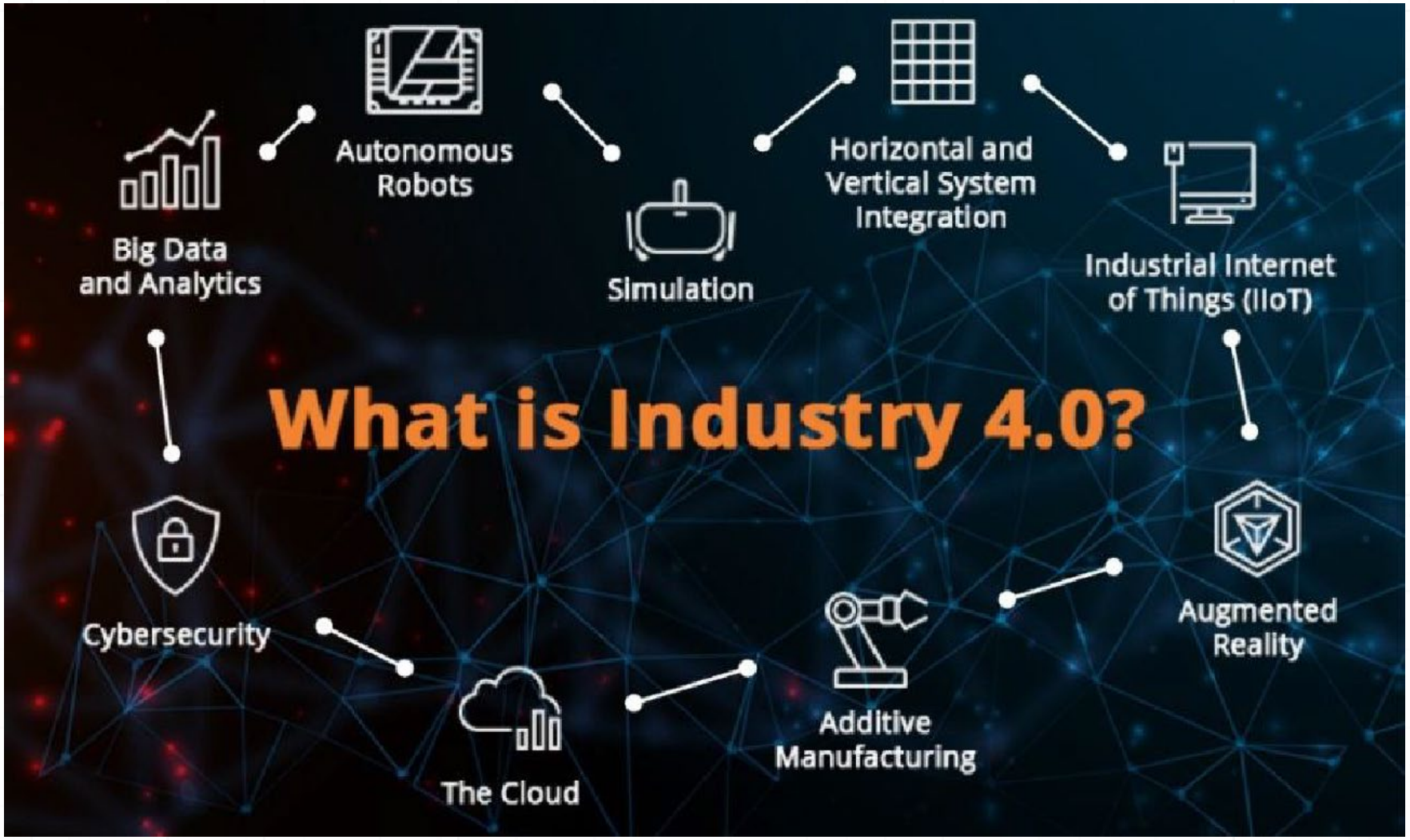
- Transportation manufacturing and automation is identified as a priority focus cluster in the 2021 Economic Growth and Diversification Plan for our region.
- Project activities will work to:
  - Discover new and innovative ways to assist companies as they expand and grow.
  - Create a talent pipeline of skilled workers to implement technology-enabled solutions to business challenges.

Goal to reduce the number of unfilled in-demand positions

- Leveraging the Industry 4.0 curriculum to train the existing workforce thus reducing turnover and providing growth and higher wages
- Direct technical assistance and advising to companies
- Outreach activities for pre-college students so that the future workforce can see themselves in an Industry 4.0 workplace

Goal to retain and grow current cluster firms and small businesses

- The curriculum and training will be ***industry-driven*** and ***flexible*** to adapt to regional needs in the future
- Technical assistance to increase business efficiencies and provide space for growth
- Enhance research through partnerships and utilization of labs and testing facilities



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WHAT IS INDUSTRY 4.0?

INTRODUCTION

WHY IS IT IMPORTANT IN OUR REGION?

GAME CHANGER!

WORLDWIDE

No turning back!

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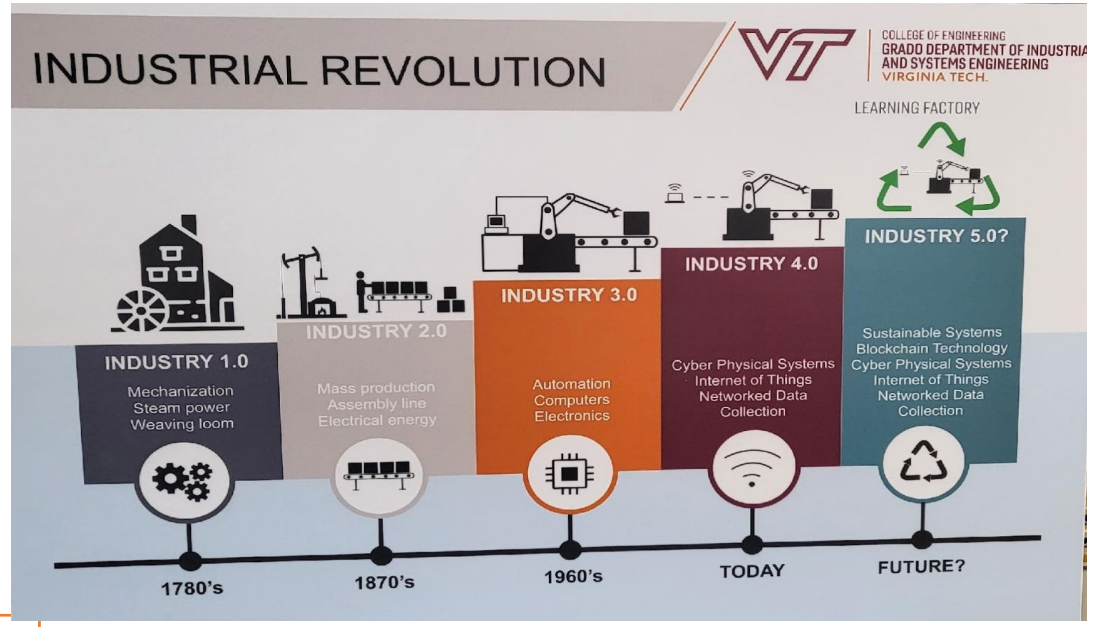
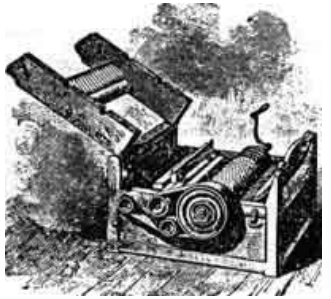
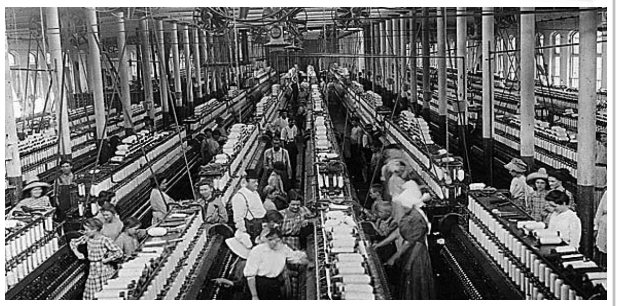
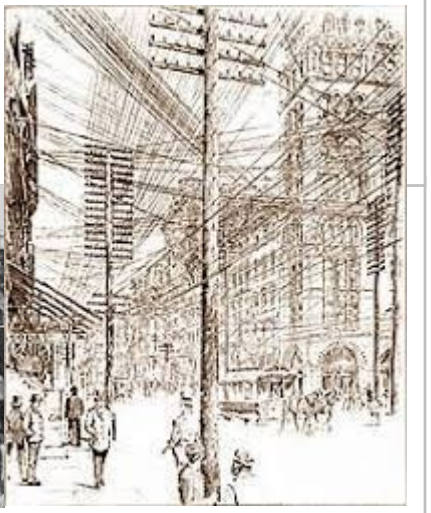
Manufacturing History 101





Eli Whitney





Common Terms Associated with the Fourth Industrial Revolution (aka, Industry 4.0)

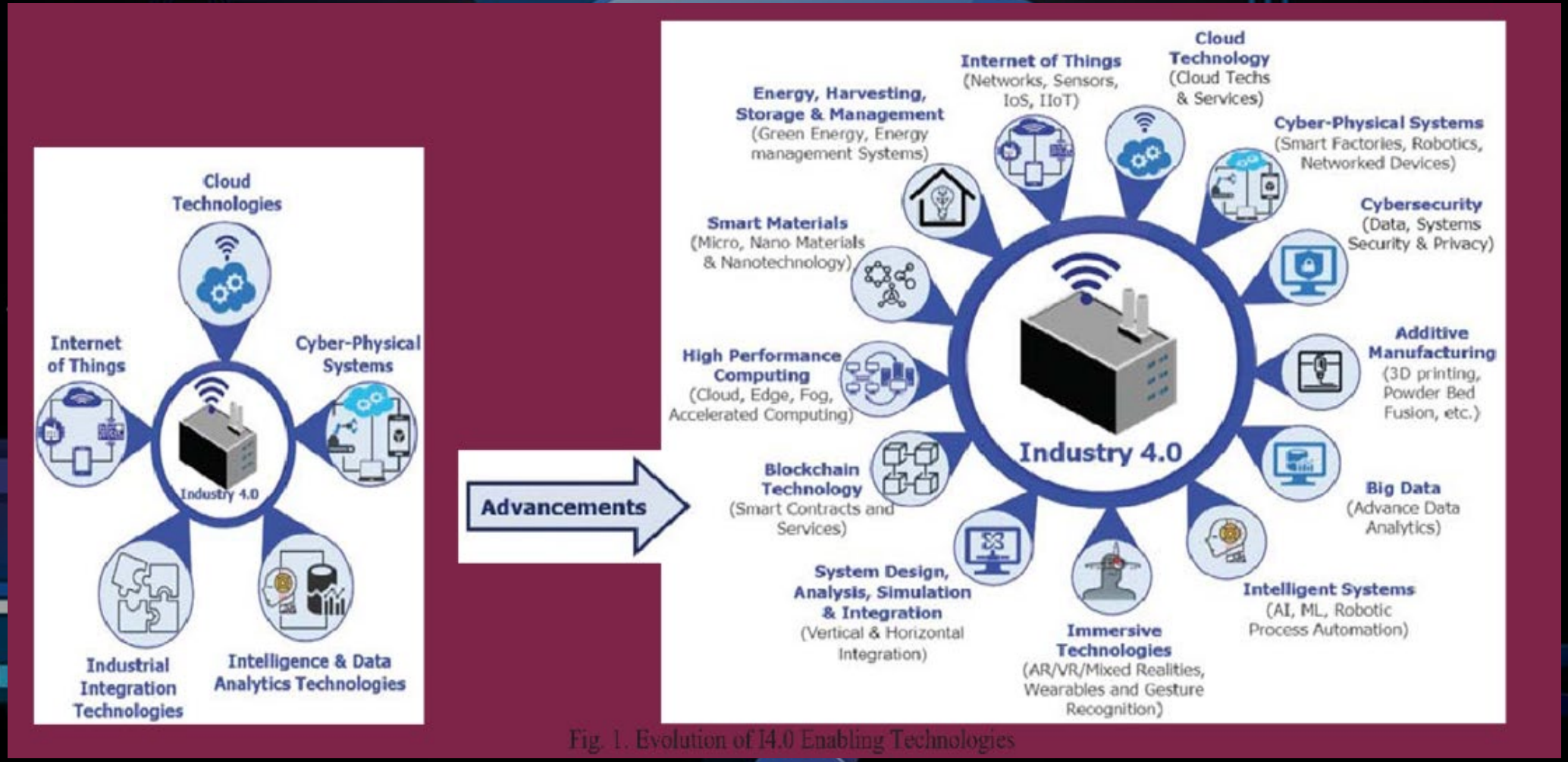


Fig. 1. Evolution of I4.0 Enabling Technologies

Matt

Industry 4.0 Wrap Up

https://www.youtube.com/watch?v=v9rZOa3CUC8&t=9s

https://www.youtube.com/watch?v=ktcRXyE8SaY

Why is it important for your workforce to learn about Industry 4.0?

According to McKinsey & Company, companies at the leading edge of Industry 4.0 implementation can realize benefits across their entire value chain and fundamentally transform a company's overall competitiveness (McKinsey & Company, 2022). Examples of these benefits include:

- Increasing labor productivity, production capacity, and reducing material losses
- Improve customer service, delivery lead times, and supply chain efficiency
- Leveraging digitized operational data for business decision making
- Facilitating more effective human - computer - robot production environments
- Achieving higher employee satisfaction from being part of the transformation process
- Capitalize on existing talent and improved skill sets to elevate the intrinsic value of your workforce
- Reducing environmental impact through waste reduction, water consumption and energy efficiency

Source: Gregolinska, E., Khanam, R., Lefort, F., & Parthasarathy, P. (2022). Capturing the true value of Industry 4.0. McKinsey & Company. https://www.mckinsey.com/capabilities/operations/our-insights/capturing-the-true-value-of-industry-four-point-zero.

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Overview of Industry 4.0 Curriculum

Module 1: Overview of Industry 4.0 and the Foundational Skills Required

Purpose: to provide an overview of Industry 4.0, common terms used; communication, team, and leadership skills for Industry 4.0.

Module 2: Soft Skills Required in Industry 4.0 Organizations

Purpose: to demonstrate the team-based requirements of Industry 4.0; workplace safety; machinery communications and the basics of network structures, procedures, and protocols; review of programming languages and cybersecurity risks and common countermeasures.

Module 3: Industry 4.0 Professional Education

Purpose: to provide continuing education for professionals; showcasing Industry 4.0 operations and technology; and advice on developing business plans and new products.

INDUSTRY 4.0 Train-the-Trainer Workshop 1
January 17-19, 2024

By the end of this Train The Trainer Course, participants will:

- Know critical skills required to educate adult learners.
- Have a general understanding of relevant Industry 4.0 concepts and technologies used by the ACE workforce of GoVA Region 2.
- Have practiced delivering relevant Industry 4.0 content for the ACE Workforce to other adult learners.
- Have developed a tentative training proposal for use at their home place of employment.

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questions/comments:

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