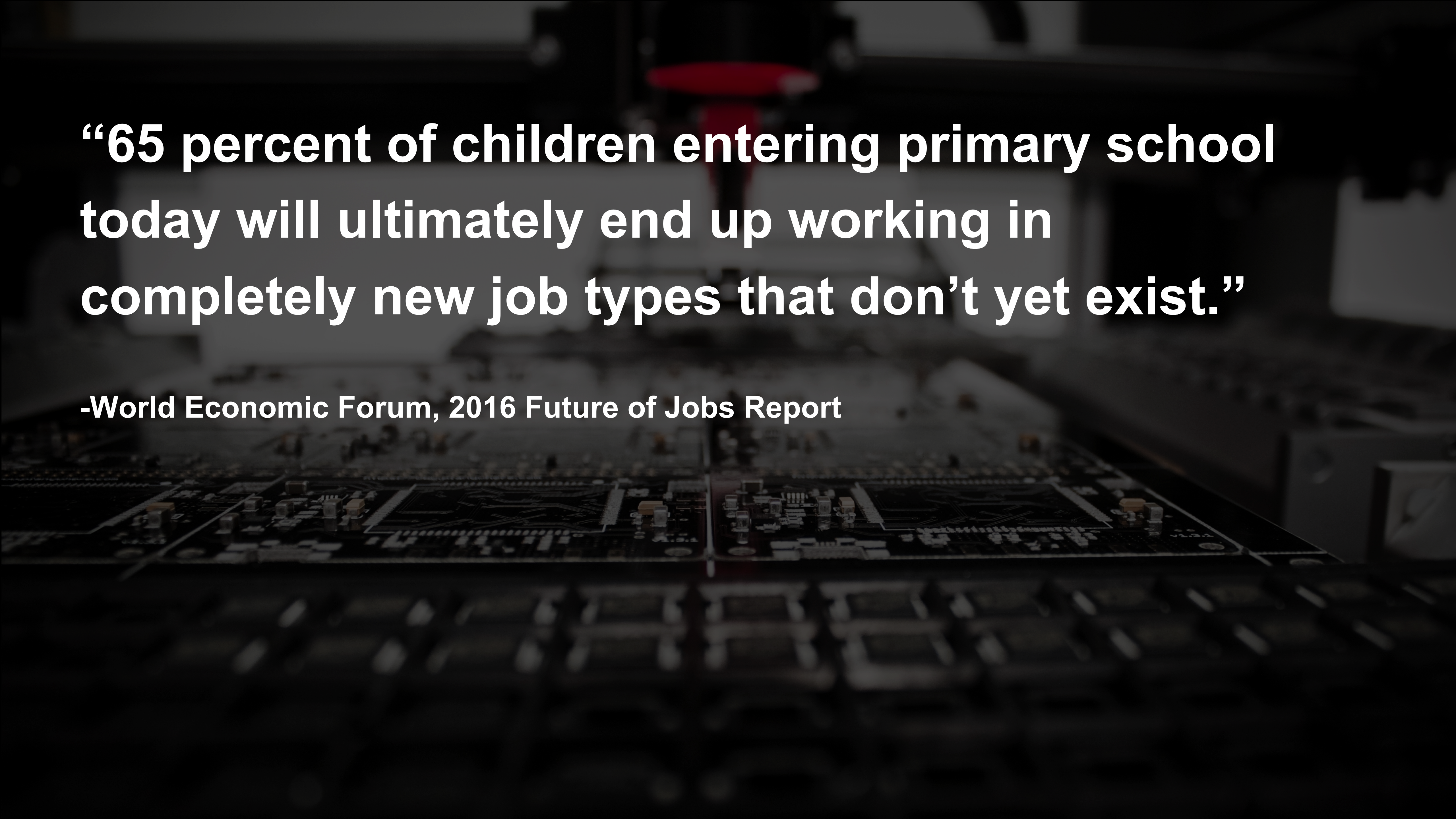# Educating the Future Workforce: A Collaborative Approach

Lizabeth Stuck | April 11, 2019

"65 percent of children entering primary school today will ultimately end up working in completely new job types that don't yet exist."

-World Economic Forum, 2016 Future of Jobs Report

Section 1: Job Role Identifier Section

Role Title: Digital Twin Architect

Role Impact: Pioneer

Summary Scope

Who develops and manages a framework that enables the creation of a virtual representation, or digital twin, of a product, process, or system? Who enables the exploration of new capabilities or performance optimization in a digital environment? A Digital Twin Architect designs the framework of data, connections, models, and software standards that will enable the creation of a digital twin (or digital copy) of a complex product, process, or system.

- Their strong understanding of a product's lifecycle will allow them to develop a framework for both product optimization as well as provide valuable data to all product stakeholders from product concept to beyond end-of-life. Depending on the detail level of the product's digital twin framework, there is the potential to outline the Digital Thread across the full product lifecycle.

- Their strong understanding of process technologies in industries such as chemical, pharmaceutical, and materials production allow them to develop a framework that leverages connected models and data sources throughout for effective design, commission, operation, optimization, and modification of the subsystems and physical assets that come together in process industries.

- Their strong understanding of systems in production and manufacturing environments, including manufacturing equipment and automation technologies allows them to develop a framework that has a positive impact on systems throughout their factory, with system-level digital twins supporting the design, commission, operation, optimization, and modification of complex manufacturing systems.

The Digital Twin Architect establishes the frameworks that support effective development, testing, and optimization in the digital environment with input from real world products, processes, or systems, a merging of two worlds. Their approach can help companies launch products faster, provide greater service to their customers, operate more efficiently, improve safety, and improve product quality in a world where our products, processes, and systems are becoming more complicated and advanced every day.
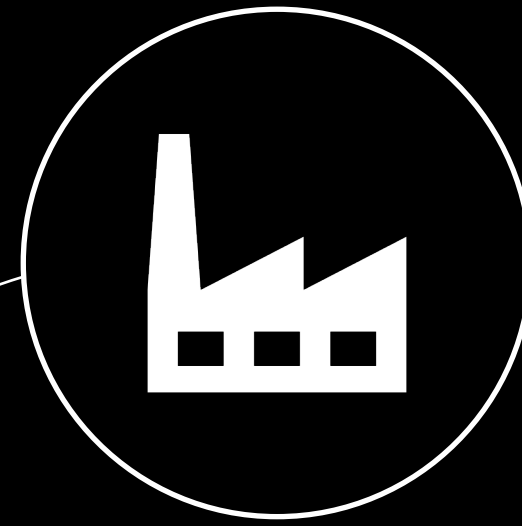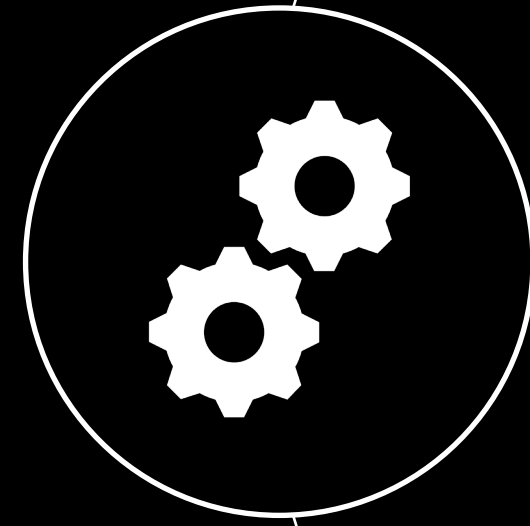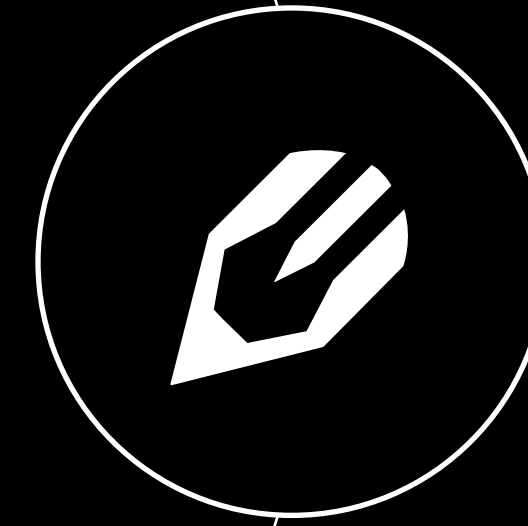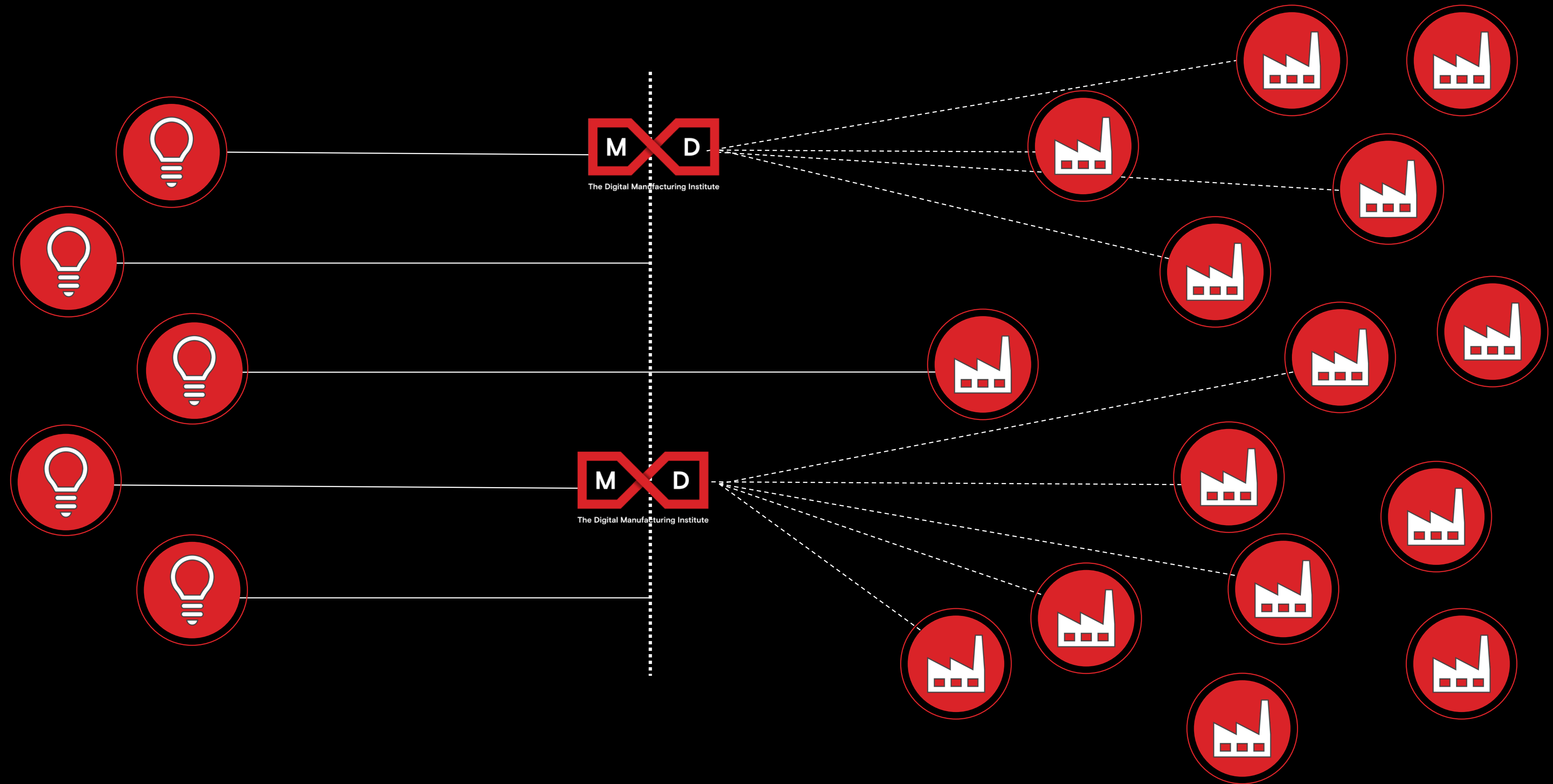
Leveraging our network, MxD intends to bridge the gap between workforce needs and practical applications

Our partners receive value through three primary initiatives

☐ **Workshops**

Topic-focused sessions where partners engage in solution oriented discussions to drive projects and investments

☐ **Projects**

Collaborative R&D focused on reduction to practice and business impact (63+ project portfolio, $90M+)

☐ **Factory Testbed**

Creating an experiential manufacturing environment to demo, test & prove a wide variety of DM&D technologies

251,774 MANUFACTURING FIRMS

~164,000 Small Manufacturers
< 20 Employees

~83,000 Mid-Size
Manufacturers
20 < Employees < 500

3,813 Large
Manufacturers
> 500 Employees

338 x 247,000 = 83,486,000 HOURS

83,486,000 HOURS x $100 PER HOUR
= $8.3 BILLION

Over the next decade, nearly 3.5 million manufacturing jobs will be needed.

2 million of those jobs are expected to go unfilled due to a skills shortage.

MxD aspires to define those roles, the skills required to do them, and the pathways to reach them.

MxD's 2019 workforce development strategy is aligned to compliment our cybersecurity initiatives

Define the Roles

Identify the manufacturing roles of the future including cybersecurity positions through the **Jobs Taxonomy 2.0**

Identify Skills Required

Develop offerings to teach the skills required for future manufacturing roles through **curriculum development**:

**IGNITE**: 3 year high school program with a cybersecurity capstone

MEEP: Pursuing proposal to expand cyber curriculum through development of Cyber Secure Dashboard training functionality

Create the Pathways

Define the pathways to achieve emerging roles through **apprenticeships, internships and hands-on training**.

C5: Community College Curriculum for Cybersecurity Compliance

Ensuring Small Manufacturer Cybersecurity Compliance and Addressing the Cyber Skills Gap Through Community College Workforce Development
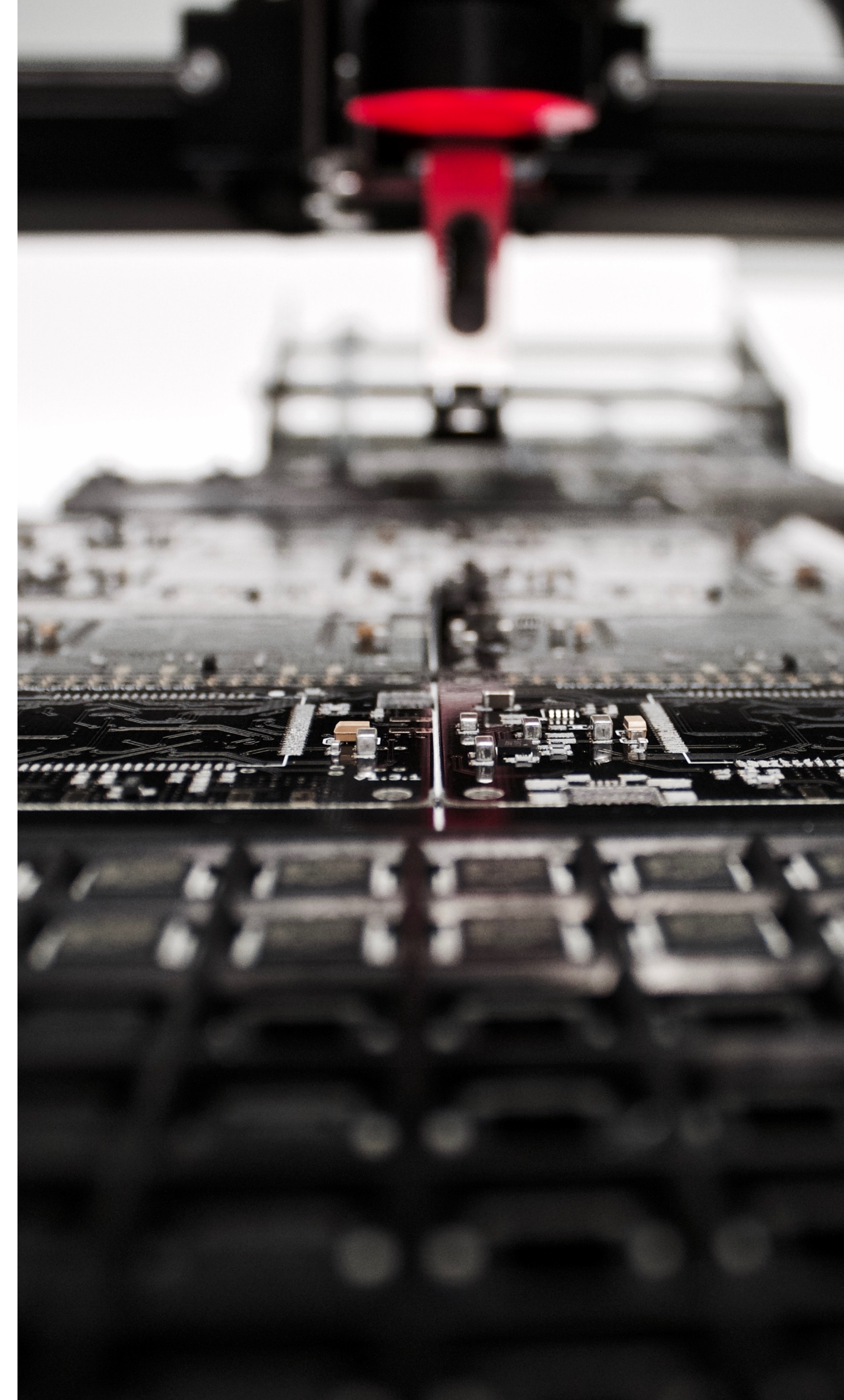
The Digital Manufacturing Institute

Thank you!

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