



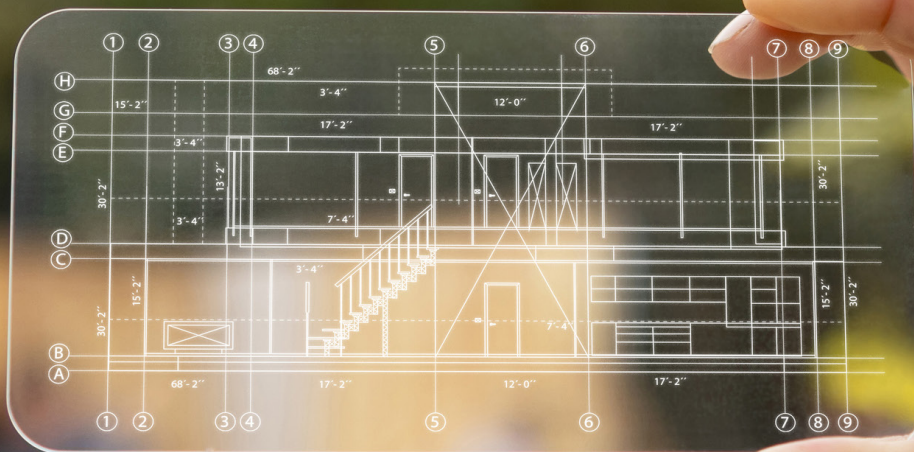
Copyright © 2024 by the Construction Financial Management Association (CFMA). All rights reserved. This article first appeared in CFMA Building Profits (a member-only benefit) and is reprinted with permission.

# Are You Prepared for the Workforce of the Future?

By Dr. Perry Daneshgari & Dr. Heather Moore

The construction industry is on the brink of a monumental transformation in its operations and financial management. While the fundamental risks – business, technical, and integration – remain, the rapid introduction of new technologies is reshaping how these risks are understood and managed. Harnessing data-driven processes, reducing waste, and standardizing work can unlock unprecedented efficiencies. This evolution paves the way for newer technologies to be seamlessly incorporated, tailored to the sector’s specific needs.

In this data-centric future, instinct will be quantified, validated, and, ultimately, replaced with hard facts. For construction leaders, this means embracing a paradigm shift toward data-driven decision-making and real-time forecasting.



Data will play a crucial role in shaping succession planning and preparing for the workforce of the future. The strategic use of artificial intelligence (AI) marks a turning point in risk management. The future of prefabrication and off-site construction hinges on this new workforce's ability to skillfully leverage data and AI.

As we approach this era of accelerated technological advancement and industrialization, the enduring principles of construction financial management are steadfast and will serve as a compass, guiding construction finance professionals through the future. For example, the significant overhaul brought about by the Federal Accounting Standards Board's (FASB's) Accounting Standard Codification (ASC) Topic 606, which redefined revenue recognition regulations in 2019 for private entities, hasn't fully impacted the industry yet.<sup>1</sup>

In addition, with the transition from the Baby Boomer generation to Millennials and Gen Z, the industry faces dual challenges: adapting to a new workforce demographic while embracing the ongoing Industrialization of Construction®. These simultaneous shifts demand a

proactive approach to workforce planning, compelling us to rethink the future of construction labor and management.

### FUTURE WORKFORCE REQUIREMENTS

Workforce evolution isn't just about numbers – it's about culture, policies, and processes that reflect and shape the people within an organization. Preparing for the future begins with today's actions: explicitly capturing and transferring knowledge to ensure growth.

While the core principles of management and strategic planning remain unchanged, the rapid evolution of people and technology necessitates a deliberate effort to bridge the knowledge gap, fostering a dynamic and prepared workforce for the future.

Looking ahead to 2030 and beyond, the requirements for the workforce were predicted in forecasts more than a decade ago:

- *Technology Integration:* Mobile devices and real-time information access is no longer a futuristic concept, but rather a daily occurrence. The introduction of the digital gang box in 2013 – now seen

on every jobsite – is a prime example of technology being adapted and adopted into toolboxes.

- *Prefabrication:* Once deemed improbable, the push for prefabrication has gained significant momentum. While research shows that, at a minimum, 30% of the work could be done off-site, the industry average is currently 3-5%. However, attitudes are changing, as evidenced by MCA, Inc.'s applied research and development of an ANSI-accredited standard for prefabrication (NECA 5-2022).<sup>2</sup>

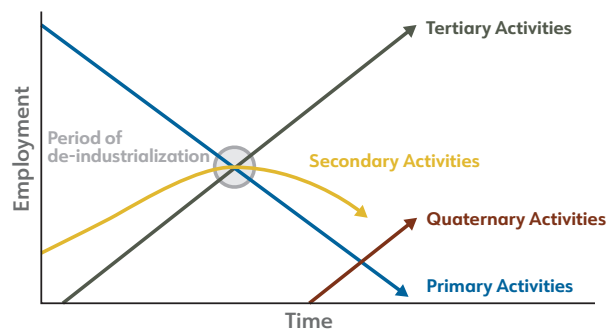
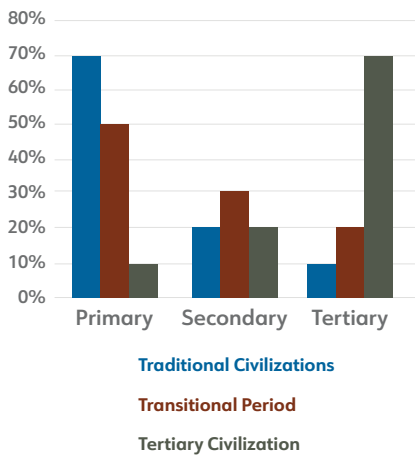
- *Work Environment Management:* Inspired by the Toyota Production System, MCA, Inc. has developed a data-driven framework that enhances project delivery by leveraging inputs from skilled tradespeople. This system focuses on optimizing work, effort, and time through precise measurements (JPAC® and SIS®) and a continuous feedback loop.

As these trends are expected to continue, ensuring your current workforce is on board and working to increase the usage of prefabrication, technology, and data will be critical to your company's future.

## Exhibit 1: Workforce Transition During & After Industrialization

*Progression of the distribution of the workforce among the three sectors, according to Fourastié.*

Agricultural society moved from traditional to transitional, moving from primary activities (Step 1) to secondary (Steps 2 and 3), and then to tertiary (Steps 4 and 5).



© MCA, Inc. & Dr. Perry Daneshgari.

### PREDICTIONS FOR NEW SKILL SETS

Recognizing how much can and will change quickly, what can you expect for the construction workforce in 2030?

Based on MCA, Inc.'s research and predictions for the Industrialization of Construction®, an expansion in the skill sets required for construction and, most important, an increased focus and familiarity with data-driven approaches to managing projects is expected. The role of the skilled trades will be supported with AI, and building codes and regulations will expand to encompass more than just the physical build to protect consumers in an expanding market.

Industrialization has already provided significant insights into how workforces have evolved over time with several key indicators of change:<sup>3</sup>

- *Shifting employment needs:* The types of jobs and the skills required are evolving rapidly as the industry adapts to new technologies and methodologies
- *Product evolution:* A decoupling of traditional inputs and outputs, leading to more innovative and efficient construction processes
- *Labor cost challenges:* Inability to compete with historic and current labor cost structures
- *Scheduling pressures:* Inability to keep up with project schedules and timelines
- *Industry consolidation:* Increased mergers and acquisitions activity and new types of businesses

These signals underscore the urgency for construction companies to not only adapt, but to also strategically prepare for the future.

### The Skills Evolution & Activities

Looking back at industrialization in other industries, the following skills must evolve over time:

- *Early industrialization:* Basic technical skills and manual labor

- *Mid industrialization:* Advanced technical skills, problem-solving abilities, and management capabilities

- *Late industrialization:* Specialized knowledge, data analysis, and strategic thinking

Exhibit 1 presents a model of how skills shift over time during industrialization. Translating this shift to the activities in construction, examples in each sector include:

- *Primary activities:* Specialized knowledge and expertise from skilled trades
- *Secondary activities:* Production and production support activities (such as logistics, material handling, prefabrication, and building information modeling), supported by the know-how and supervision of the skilled trades and in support of the final installation quality
- *Tertiary activities:* Non-production activities (such as customer service, data management, and administrative support) and an increase in industry-wide dedication to and enforcement of standards and limitations

The shift toward a tertiary workforce — one centered on services and information — highlights the increasing importance of knowledge-based skills. With construction currently in step 2 of industrialization, what can the industry proactively do to prepare for a workforce with a mix of skill sets?

Exhibit 2 draws a parallel between construction and the manufacturing industry during the 1920s, which was also in step 2 of industrialization.<sup>4</sup> At that time, the industry was directly in the crosshairs of secondary and tertiary activities overcoming the primary ones.<sup>5</sup>

In translating this into construction and looking ahead to 2030, the model explains the need to focus on preparing for a future workforce and supporting skill sets for these secondary and tertiary activities.

Exhibit 2: Workforce Transition During & After Industrialization

### Clark's Sector Model, U.S.

Primary Industry Employees  
Primary Industry Employees (trendline)  
Government Employees

Secondary Industry Employees  
Secondary Industry Employees (trendline)

Tertiary Industry Employees  
Tertiary Industry Employees (trendline)

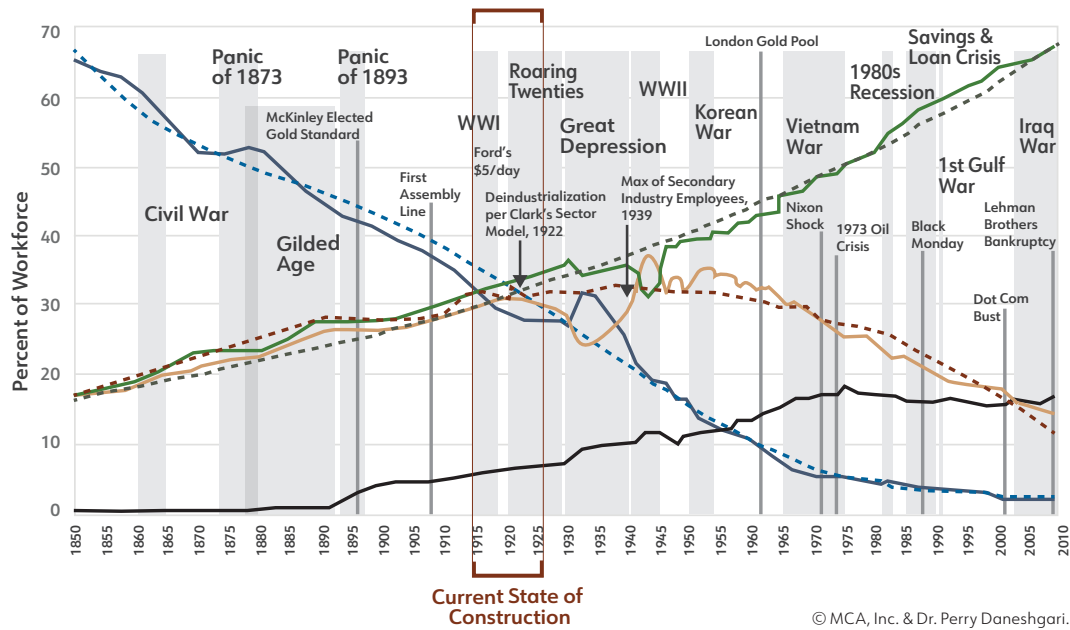
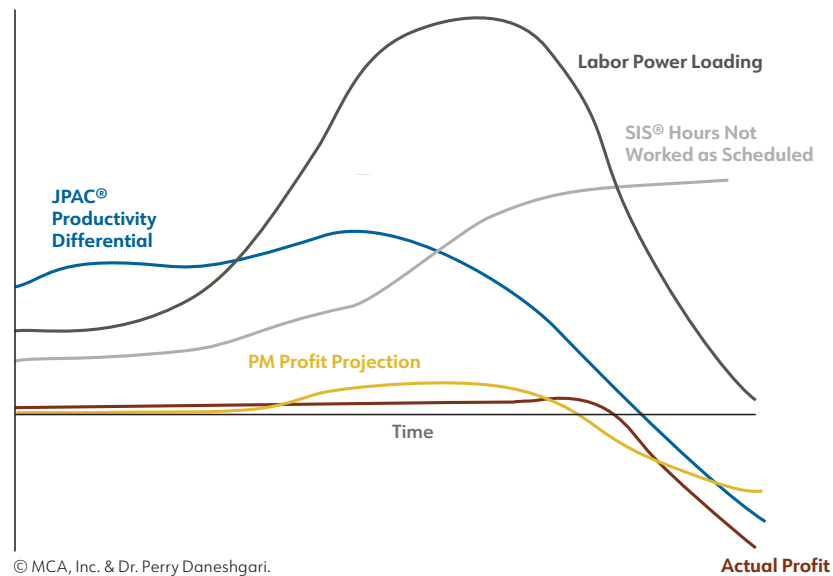


Exhibit 3: WEM® Forecasting With Lead Indicators



MCA, Inc.'s CEO Forum, which represents \$8 billion in construction revenue,<sup>6</sup> has been discussing these skills for the past few years. They've identified the following key roles and skills to support expanding secondary activities with a smaller number of resources:

- Key roles:

- Project coordinator: supports data-driven project management
- Product manager: supports the outcome of construction as a configured product rather than specialized parts and pieces coming together
- Expanding the organizational structure for Externalizing Work<sup>®</sup> (beyond just the prefabrication manager) to oversee: production management, process management, quality management with continuous learning and improvement, and logistics and vendor support

- Skills

- Interdisciplinary workforce
- Technical aptitude or exposure
- Data-driven decision-making through the use of statistical process control
- Critical thinking and adaptability
- Project management (as more than just a title)
- Logistics support (e.g., packaging engineering)
- Interpersonal skills, supporting a dealership model of construction delivery

In addition to these specific skill sets, past *CFMA Building Profits* articles explained and provided links to various litmus tests to gauge workforce readiness, in terms of:

- Project management<sup>7</sup>
- Prefabrication<sup>8</sup>
- Overall transition to the Industrialization of Construction<sup>9</sup>

**WHILE AI AND DATA ANALYTICS PROVIDE POWERFUL TOOLS,** experienced professionals bring context, intuition, and ethical considerations that technology alone cannot replicate. **COMBINING AI WITH HUMAN EXPERTISE ENSURES A HOLISTIC APPROACH** to problem-solving and innovation.

These tests assess the ability to transfer and use tacit knowledge with explicit data-driven processes and decision-making structures, while integrating new technologies and adapting to changing demands.

### WORKING WITH DATA: THE ROLE OF AI IN WORK ENVIRONMENT MANAGEMENT

By 2030, data is expected to be a critical asset in construction, driving decision-making and operational efficiency. The ability to collect, analyze, and interpret data with a proficiency in data quality will be required for construction businesses to remain competitive and innovative.

While finding and training this skill set has become imminent, the use of AI is unfolding in parallel by automating processes, enhancing decision-making, and improving productivity.<sup>10</sup> However, as with any machine moving faster than human capacity, relying solely on intuition and experience is no longer sufficient. Speed and complexity in modern construction projects demand data-backed insights.

We see this happening on construction jobsites today. The workforce of the past is used to building and relying on their personal skills and experiences, but when the jobs become faster and more

complex, it becomes *impossible* to manage without data.

Manufacturing went through the same breakthrough when Henry Ford was able to segregate the work and increase production with the novel use of assembly lines. The rapid increase in demand and production volume soon revealed that traditional quality control methods were insufficient.<sup>11</sup> The introduction of statistical process control reshaped how manufacturing ensured quality.<sup>12</sup> The data-driven approach linked human intelligence with robust systems to manage work environments, long before the term AI was coined.

In construction, managing the work environment must link the following to develop a full Agile Intelligence™:

- Three independent databases: accounting, estimating, and field/operations
- Three independent variables: work, effort, and time

An empirical model for connecting work, effort, and time is shown in Exhibit 3, where indicators and data predict early on what will happen with the schedule, labor power, productivity, and financials. While strong project management is a good foundation, the skill sets to use math and modeling to forecast project outcomes highlights the balance AI brings between guidance and autonomy.



Just as pilots rely on instruments for safe navigation while retaining some manual control, workers use AI to enhance their capabilities while maintaining critical decision-making authority. This balance ensures that freedom in the workplace is structured and productive, leveraging AI for routine tasks while humans focus on complex problem-solving.

### THE KEYS FOR THE FUTURE

Despite the amount of data available to emerging workforce, the profound knowledge of experience is still needed for data quality management. While the next generation may grow up with AI informing their daily decisions, the complexities of construction demand a deeper understanding. The current workforce will need to build a bridge from the instinctual past to the data-driven future, demonstrating and coaching how to act, communicate, and follow up with those decisions.

As construction increasingly relies on data, ensuring its quality becomes paramount. Decision-makers must develop the skills to judge data accuracy and relevance, and this involves understanding data sources, recognizing potential biases, and employing statistical methods to validate findings. A workforce adept at these skills can make more reliable and impactful decisions.

While AI and data analytics provide powerful tools, experienced professionals bring context, intuition, and ethical considerations that technology alone cannot replicate. Combining AI with human expertise ensures a holistic approach to problem-solving and innovation.

For example, an Agile practitioner was running a very large project using JPAC® to measure productivity and had several new assistant project managers (PMs) supporting the field capture of work. The well-seasoned superintendent was amazed that the new assistant PMs were unsure if they were supposed to get 10 feet or 1,000 feet of duct bank installed in one day. The link between these two roles will be critical to ensure AI matches reality and experience. Otherwise,

the industry may slip backwards; or worse, be forced to relearn the experience of generations prior.

### CONCLUSION

Preparing for the workforce of 2030 involves understanding emerging trends, leveraging technology, and balancing new skills with foundational knowledge. Through strategic education and training initiatives, industries can cultivate workforces ready to meet the challenges of tomorrow.

The role of data and AI in work environment management is transformative, offering enhanced efficiency, better decision-making, and innovative solutions. However, the successful integration of these technologies requires a balanced approach that values human insight and experience.

By cultivating a workforce skilled in data analytics, critical thinking, and adaptive problem-solving, organizations will be better equipped to navigate the increasingly complex construction landscape. This balanced approach – combining human intuition with technological advances – will ultimately drive sustainable growth and ensure long-term success in a rapidly evolving industry. **BP**

*The authors would like to thank the MCA, Inc. CEO Forum for their contributions to this article.*



**DR. PERRY DANESHGARI** is President and CEO of MCA, Inc. (*mca.net*) in Grand Blanc, MI. MCA, Inc. focuses on implementing process and product development, waste reduction, and productivity

improvement of labor, project management, estimation, and accounting. He has been previously published in *CFMA Building Profits*, linking his background in management, economics, and his PhD in Mechanical Engineering with the industry's practical needs. He has worked with hundreds of contractors to improve productivity and processes both on construction projects and within the contractor's overall operations. Dr. Perry can be reached at 810-232-9797 and [perry@mca.net](mailto:perry@mca.net).

## Are You Prepared for the Workforce of the Future?



### DR. HEATHER MOORE

is the Vice President of Customer Care and Support at MCA, Inc. ([mca.net](http://mca.net)) in Grand Blanc, MI. A frequent author for *CFMA Building Profits*, she holds a PhD in Construction Management with a focus on information available from the jobsite work environment using MCA, Inc.'s processes and tools for Work Environment Management (WEM®). She has contributed to research as well as customer process implementation with MCA, Inc. Dr. Heather can be reached at 810-232-9797 and [hmoore@mca.net](mailto:hmoore@mca.net).

### Endnotes

1. "Revenue Recognition." *Financial Accounting Standards Board*. [fasb.org/page/PageContent?pagelid=/projects/recentlycompleted/revenue-recognition-summary.html](http://fasb.org/page/PageContent?pagelid=/projects/recentlycompleted/revenue-recognition-summary.html).
2. "Up to Code." *National Electrical Contractors Association*. August 21, 2023. [necanet.org/programs/codesandstandards/up-to-code](http://necanet.org/programs/codesandstandards/up-to-code).
3. Daneshgari, Dr. Perry & Moore, Dr. Heather. "Industrialization of Construction®. How it will happen, and how to stay ahead using Agile Construction®." MCA, Inc. 2024.
4. Moore, Dr. Heather & Parvin, Sydney. "How Industrialized Are You? Measuring Your Company's Progress." *CFMA Building Profits*. November/December 2021. [cfmabponline.net/cfmabp/11122021/MobilePagedArticle.action?articleid=1743447](http://cfmabponline.net/cfmabp/11122021/MobilePagedArticle.action?articleid=1743447).
5. Kossik, John. "Clark's Sector Model for US Economy 1850-2009." 63 Alfred Street: *Where Capitalism Failed*. 2011. [63alfred.com/whomakesit/clarksmodel.htm](http://63alfred.com/whomakesit/clarksmodel.htm).
6. "CEO Forum." MCA, Inc. [mca.net/events-main/ceo-forum](http://mca.net/events-main/ceo-forum).
7. Moore, Dr. Heather & Nimmo, Phil. "Orchestrating Success: Connecting Work, Effort & Time." *CFMA Building Profits*. March/April 2024. [cfmabponline.net/cfmabp/03042024/MobilePagedArticle.action?articleid=1973136](http://cfmabponline.net/cfmabp/03042024/MobilePagedArticle.action?articleid=1973136).
8. Daneshgari, Dr. Perry & Moore, Dr. Heather. "Jobsite to Garage: Changing the Mindset of Prefab & Modular Construction." *CFMA Building Profits*. March/April 2020. [cfmabponline.net/cfmabp/20200304/MobilePagedArticle.action?articleid=1656724](http://cfmabponline.net/cfmabp/20200304/MobilePagedArticle.action?articleid=1656724).
9. Daneshgari, Dr. Perry & Moore, Dr. Heather. "Transforming Construction: AI's Role in Building the Future." *CFMA Building Profits*. November/December 2023. [cfmabponline.net/cfmabp/11122023/MobilePagedArticle.action?articleid=1938825](http://cfmabponline.net/cfmabp/11122023/MobilePagedArticle.action?articleid=1938825).
10. Daneshgari, Dr. Perry & Moore, Dr. Heather. "Connecting the Dots: AI & the Future of Construction." *CFMA Building Profits*. January/February 2024. [cfmabponline.net/cfmabp/01022024/MobilePagedArticle.action?articleid=1956272](http://cfmabponline.net/cfmabp/01022024/MobilePagedArticle.action?articleid=1956272).; Daneshgari, Dr. Perry & Moore, Dr. Heather. "Transforming Construction: AI's Role in Building the Future." *CFMA Building Profits*. November/December 2023. [cfmabponline.net/cfmabp/11122023/MobilePagedArticle.action?articleid=1938825](http://cfmabponline.net/cfmabp/11122023/MobilePagedArticle.action?articleid=1938825).
11. Ford, Henry & Crowther, Samuel. "My Life and Work." *Doubleday, Page & Company*. 1922.
12. Shewhart, Walter. "Economic Control of Quality of Manufactured Product." *D. Van Nostrand Company, Inc.* 1923.; Deming, William Edwards. "Out of the Crisis." *Massachusetts Institute of Technology*. 1986.