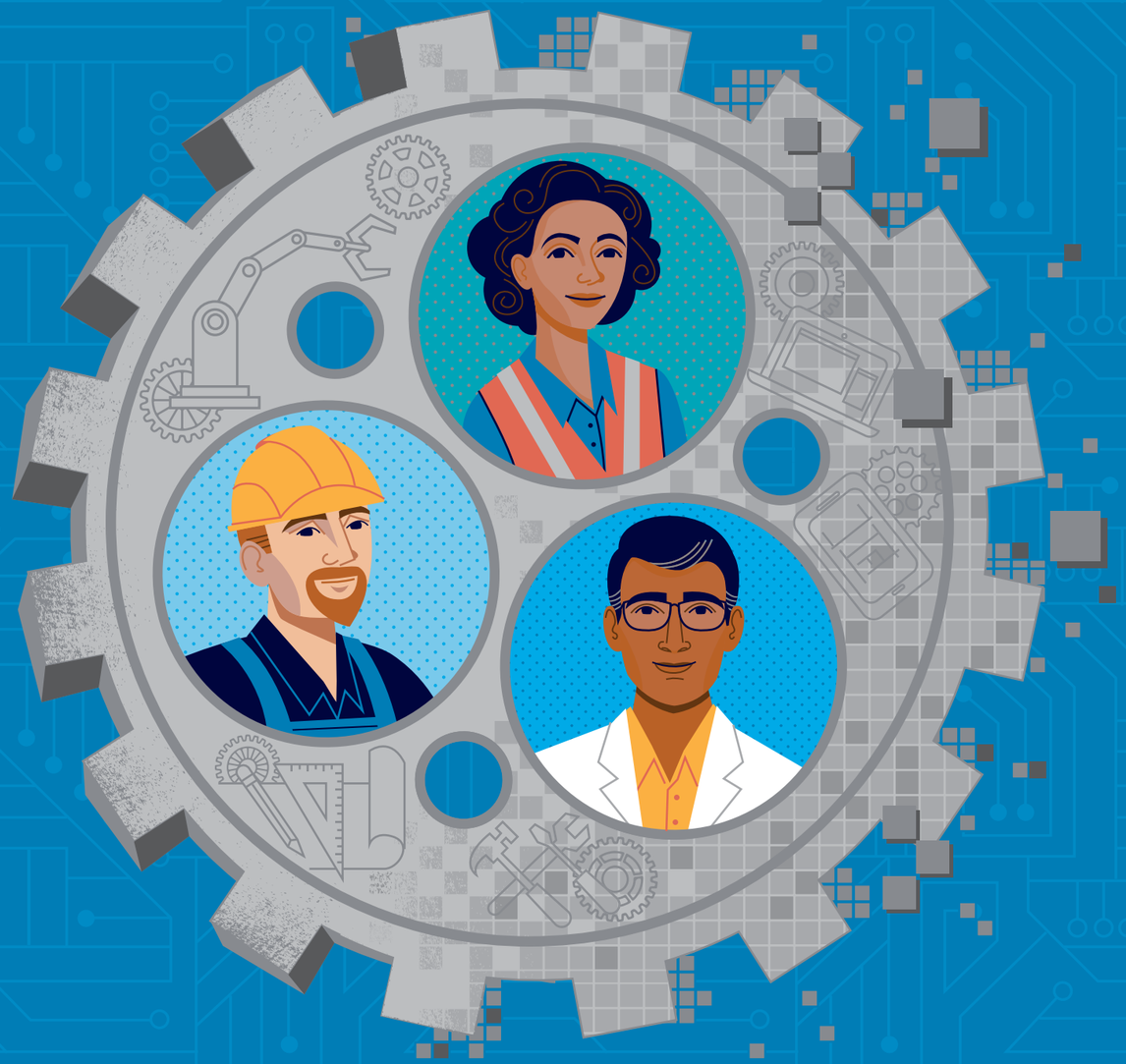
Deloitte. Insights

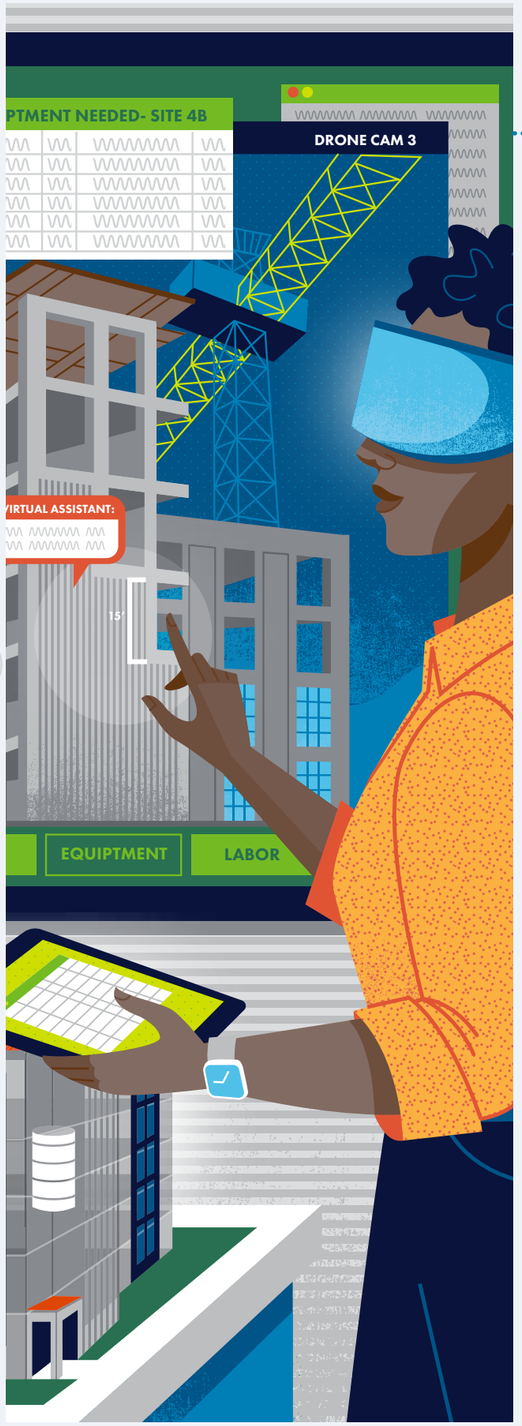
A DELOITTE SERIES ON THE SKILLS GAP AND THE FUTURE OF WORK IN MANUFACTURING



The future of work in manufacturing

What will jobs look like in the digital era?

SMART SCHEDULER



SMART SCHEDULER

Summary

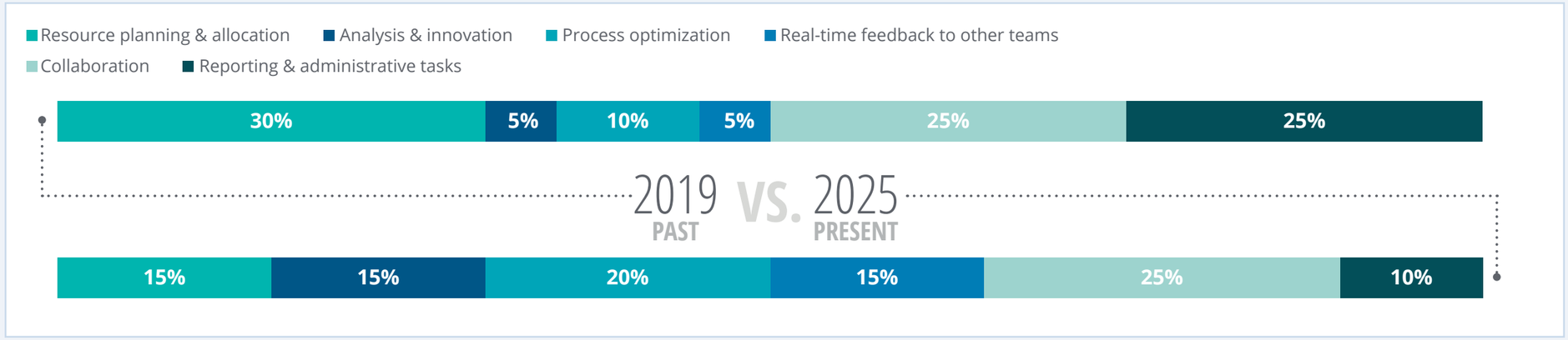
The smart scheduler uses smart and connected technologies to develop and maintain program schedules on construction work. In the construction site of 2025, many scheduling tasks are automated; the tracking of labor, equipment, and raw materials are digitalized; and performance is captured in real time. A smart scheduler creates a digital thread from these activities using custom applications or off-the-shelf digital tools—from mapping construction site progress to ensuring just-in-time availability of materials, labor, and construction equipment. With the rise in automated scheduling tasks, the smart scheduler's role now includes higher-value functions such as constraints management, resource optimization, schedule optimization, planning for unexpected events, and real-time persona-based visualization.

Smart schedulers also oversee sites that are remote or situated far apart. Virtual meeting tools, images from drones and geospatial technology, 5D Building Information Modeling (BIM), information from IoT devices, and advanced analytics (AI/machine learning) now forecast, with a high degree of confidence, project-level progress to detect anomalies and recommend corrective action. Furthermore, a smart scheduler plays a crucial role in budgetary allocation for projects. A smart scheduler's inputs are critical to accurately forecast material and equipment usability and labor requirements on a daily and weekly basis to help improve utilization.

Responsibilities

- Use connected technologies to collect and analyze information used to plan and schedule construction projects—generating forecasts, variance reports, and other analytics/insights that help monitor and manage projects.
- Maintain real-time visibility into current and future schedules of equipment, material, and labor across multiple construction sites.
- Ensure the required material and equipment for ongoing and planned construction projects are in place as per the schedule.
- Work in coordination with project management, procurement, and engineering and construction teams for planning and scheduling.
- Leverage digital technologies such as drones, geospatial mapping, cobots, and autonomous cranes to maximize their impact on project efficiency and profitability.
- Use predictive analytics to assist the finance team in planning the budgetary allocation for materials and equipment.

Time spent on activities



ERICA CHOMSKY

SMART SCHEDULER
Denson Constructions LLC | *Los Angeles, California*

Proficient in developing and maintaining program schedules using advanced data analytics and visualization to identify relationships, logic, milestones, and constraints for construction projects of various types; leverages predictive analytics and cognitive tools for understanding bottlenecks for dynamic replanning to improve schedule adherence.

Experience

Smart scheduler
Denson Constructions LLC *August 2021–Present | 4 years 2 months*
Develops and maintains detailed construction planning schedules, including labor, materials, and machines, for new construction and renovation work by leveraging analytics and digital dashboards to plan for several scenarios and finalize optimal construction sequencing and contracting plans.

Senior scheduler
Legacy Construction Consulting *June 2018–April 2020 | 1 year 11 months*
Created and developed conceptual what-if schedules for multiple project types, including large and complex multiyear projects.

Construction scheduler
Custer Construction Services, Inc. *July 2016–May 2018 | 1 years 11 months*
Developed and analyzed man-hour resources, equipment resources, and cost-loaded, time-phased schedules

Education

University of Southern California
Graduate in advanced construction scheduling
2020–2021

Harvey Mudd College
Bachelor of science, construction management
2012–2016

Certifications

EdX
Microdegree in analytics

OpenLearnOrg
Certificate in project management

LinkedIn Learning
Programming for nonprogrammers

Skills and endorsements

- **Analytics** · 443
  Endorsed by **Jane** and **Ira**, who are highly skilled at this
- **Data life cycle management** · 409
  Endorsed by **Kiara** and **Michelle**, who are highly skilled at this
- **Demand analytics** · 365
  Endorsed by **Maria** and **David**, who are highly skilled at this
- **IoT tools** · 323
  Endorsed by **Gina** and **John**, who is highly skilled at this
- **Resource optimization** · 317
  Endorsed by **Jonathan** and **Rene**, and others who are highly skilled at this
- **Inventory optimization** · 258
  Endorsed by **Sandra** and **Christine**, who are highly skilled at this
- **Logistics and warehouse management** · 191
  Endorsed by **Ryan** and **Tom**, who are highly skilled at this
- **Materials and supplier management** · 166
  Endorsed by **Peter**, who is highly skilled at this
- **Project management** · 112
  Endorsed by **Gordon**, who is highly skilled at this
- **Visualization** · 74
  Endorsed by **Drew**, who is highly skilled at this

TOOLBOX

THE TOOLBOX SUPPORTS THE WORKER AS A WHOLE—IN ACHIEVING EXTERNAL OUTCOMES SUCH AS PRODUCTIVITY AS WELL AS INTERNALLY FOCUSED ONES SUCH AS DECISION-MAKING AND LEARNING.

Productivity

SmartDrive
It is a smart fleet management system that integrates connected automated provide real-time visibility on fleet status and helps to improve vehicles productivity and safety.

Venus
This artificial intelligence (AI)–powered, voice-enabled digital assistant provides a conversational interface for all productivity-related tasks, from scheduling to finding answers to questions and checking the status of specific tasks.

Symphony
This software suite connects smart schedulers with other resources—people, machines, and systems–for data-driven connected construction. Using advanced real-time analytics, it can help smart schedulers analyze and track project and site performance.

VirtuMeet
This augmented reality (AR) smart glass conference room with AI capabilities allows global partners to meet and collaborate, overcoming the barriers of physical separation.

InstaCap
This tool captures data automatically using digital technologies such as radio frequency identification (RFID) and speech recognition. It can help collect information from machines, images, or even sounds without manual data entry.

Share Smart
It is an enterprise social and mobile technology tool that can help in sharing digital 3D designs and images as digital files to improve the collaboration necessary to build new products or assembly lines and configure supply networks.

WeAR
It is an AR/wearable device that connects IoT devices and receives work instructions and training. These smart glasses, paired with bluetooth-enabled scanners and voice guidance, respond to commands and open a pop-up on monocular display, which help boost productivity.

AIEnhance
It comprises AI-enabled enhancements, including AI exoskeleton, autonomous work cells with cobots, robotic arms, or robots for execution support.

AuRo
It is an AR tool that is designed to assist maintenance personnel in maintaining and repairing equipment using vision picking to produce a faster, hands-free solution for precarious or delicate tasks.

Decision-making

Smart Dash
It is a visual display that presents data, live information, and analysis, including predictive analytics, from multiple sources to facilitate informed decision-making.

Envision
This tool uses machine learning to identify and rectify potential problems. It also helps discover opportunities to influence business decisions that drive financial or other key results.

DST
It is a digital scheduling tool that provides updates on the status of machinery, equipment, and material required or in-progress at the site. It helps with real-time status updates on labor availability.

Learning

SkillsPro
This smart learning assistant helps smart schedulers refresh existing skills as well as learn new and emerging skills. Its conversation mode shares tips and tricks about the tools/techniques that a scheduler has learned recently. When synced with a scheduler's project planner, it shares a list of skills to be learned for implementation in upcoming projects.

HeMoSite
It is an enterprise health monitoring site that helps to track the working conditions and environment of each professional, highlighting any exposure to potential hazardous elements or heavy-duty machinery.

A DAY IN THE LIFE

05:30 AM

Erica starts her day early to beat the early fall heat as she will be working out of the construction site office today and uses her company's vehicle with **SmartDrive**, to reach the construction site. **Venus** promptly logs her onto the company's network and highlights **DST** updates on the dash-display. The **DST** dashboard highlights the list of material deliveries scheduled at the construction site. It also runs a comparative analysis of data and shows no deviation in the plan.

06:00 AM

As Erica arrives at the site office, her crew is notified that she is on-site, and they can begin reporting to her. At her desk, she reviews **Smart Dash** to check the status of available construction material and connected tools. The predictive analytics tab highlights next week's requirements. She checks the projection tab for this week's labor-hour utilization. Erica then runs a few sensitivity tests on these tabs and finalizes the workflow from the highlighted outputs. Based on her selection, **Smart Dash** updates the request for new materials on **DST** and schedules the delivery at the warehouse for later this week.

07:00 AM

Erica is currently taking care of three construction sites—at New York, Chicago, and Wisconsin. She picks up **WeAR** to check the live status of the New York construction site. She is joined by Steve, the project manager for this site, and **WeAR** feeds them with live images and provides an update on the work. Erica uploads these live streams on **Symphony**, which will later be used for digital and real-life comparison using geospatial imaging technology. After the meeting, using **Share Smart**, Erica shares the requirements list with Mike, a sales representative from SAA, a Dallas-based subcontractor that provides specialized services to their sites.

08:00 AM

Using information from **InstaCap**, Erica analyzes idle time for smart cranes, forklifts, and digital cobots at the New York site. She reviews the predictive analysis reports of **Smart Dash** on all the equipment to ensure that they are up and running during the week. She reaches out to Edwin, the robot teaming coordinator, and Jamie, the drone data coordinator, to create a report for her board on the progress of automation and security robustness in their smart machinery and cobots. Erica and Edwin notice that after the implementation of **AIEnhance**, their labor productivity is up by 15 percent across the three construction sites. Moreover, the **AuRo** report shows a 35 percent reduction in downtime and maintenance costs.

10:30 AM

Erica opens **HeMoSite** to check the alerts about the construction site's workforce exposure to dust and other hazardous particles to flag any issues to the site's environment, health, and safety (EH&S) officer. Erica goes out for coffee with Gina, her senior project manager. Gina wants to discuss some prescriptive measures for their excavators. The **Envision** report highlights the location and work performance of all the heavy equipment. The past performance trends of excavators highlight the need for upgrades. Erica asks Gina to connect with Colin, a digital twin engineer for Denson, to assess the impact of these upgrades on their financials. Depending on the results, Erica plans to propose a viable solution to the board.

12:00 PM

John, her site engineer, points out to Erica that the recent batch of steel does not meet the parameters agreed upon by **DST**. Erica then looks at **Venus**, which suggests a new grade of silicone material that could help reduce costs with a short turnaround time. Erica requests John to evaluate the alternative and update the feasibility report on **Smart Dash**.

01:00 PM

Back at her desk, Erica opens **Smart Dash**. She notes that the three ongoing projects are on schedule, and two are in the planning stages. She opens the resource forecasting page for new projects, highlighting all the equipment, material, and labor required on a daily and weekly basis. Downloading a few key highlights, Erica uses **Share Smart** to share these with her procurement and project management team to incorporate those in their plan for the next quarter.

01:30 PM

Erica and Roger, the finance manager, log onto **Virtu Meet** to discuss the budgetary allocation for the ongoing projects. Erica shares her analysis from **Smart Dash** with Roger and suggests that electrical fittings procurement can be postponed by a week due to proposed changes in the Chicago site, which will help them free up the project cash flow for other purposes. **Share Smart** records all the information, projects the new procurement schedule, and shares this with the procurement team.

02:30 PM

As Erica begins wrapping up her workday to attend her son's football game, she receives a pop-up from ***SkillsPro***, suggesting a new course on artificial neural networks is now available. Erica asks ***SkillsPro*** to enroll her in the course.

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