

The future of work in manufacturing

What will jobs look like in the digital era?

SMART SAFETY SUPERVISOR

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Summary

With autonomous equipment, unmanned drones, and advanced materials at construction sites, managing the environment, health, and safety (EHS) aspects of engineering and construction (E&C) projects would be just one responsibility for the smart safety supervisor (S³). In their expanded role, S³s are expected to work with operational, logistics, and technology teams to find new synergies that can improve the safety of the construction site. S³s are fluent in advanced technologies, and they serve as a conduit to match applications such as augmented reality (AR) glasses, smart helmets, and connected clothing with use cases for creating a safe and efficient work site.

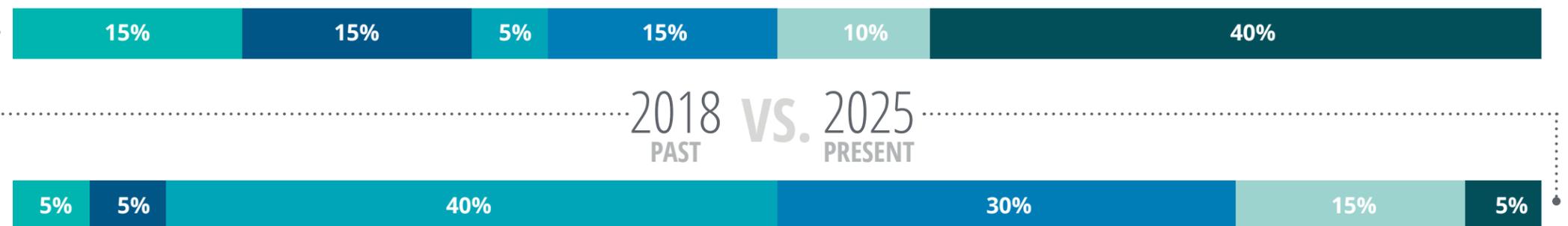
Using their broad knowledge of regulations, EHS standards, and available technologies, S³s can help E&C companies develop technology implementation road maps, which can reduce manual inspections in unsafe or hazardous locations. They can also leverage the digital twin of the construction site to oversee the health and safety of both human workers and machines. Using analytical dashboards, S³s can identify whether machines are being operated properly and analyze the impact of machine operations on overall site safety and compliance.

Responsibilities

- Identify new technologies to embed in systems and processes that optimize EHS performance and meet set safety targets.
- Formulate safety procedures and plans to reduce potential identifiable safety hazards using advanced technologies and solutions.
- Incorporate specialized risk management principles to develop a conducive work environment between humans and machines.
- Supervise safety specialists to ensure all requirements are met to achieve EHS zero-incident performance.
- Act as field safety coordinator/inspector to conduct incident investigations and develop quality criteria to improve safety ratings of work sites.
- Provide technical support to feasibility studies, site assessment studies, safety cases, and work packages.

Time spent on activities

■ Project management ■ Training or assisting other teams ■ Analysis and innovation ■ Process optimization ■ Share analysis/feedback with process-product managers ■ Reporting and administrative tasks





DANIEL WOOLMER

SMART SAFETY SUPERVISOR

Afility Construction LLC | Los Angeles, California

Skilled in environment, health, and safety (EHS), workplace safety, inspection, and risk assessment; proficient in digital tools and EHS technologies; has developed and implemented multiple health and safety programs for various construction projects; leverages predictive analytics and cognitive tools for incident investigation and corrective measures.

Experience

Smart safety supervisor

Afility Construction LLC Feb 2020–Present | 4 years 8 months

Leads multiple digital initiatives to reduce work process risks, raise safety awareness, and improve safe work practices with the help of digital tools and data analytics; responsible for developing and maintaining the company's safety program; and liaises with the US Department of Labor.

Senior safety supervisor

Bengshaw Construction Consulting Jul 2017–Jan 2020 | 2 years 6 months

Key developer for the EHS portion of the project management plan; helped in developing the digital incident management tool; managed safety and health programs of contractors and provided leadership to safety professionals across several projects.

Safety associate

Roster Construction Services, Inc. Aug 2015–June 2017 | 1 year 10 months

Prepared daily, weekly, monthly, quarterly, and annual statistical incident/ data analysis for the work site; worked with supervisor and operations to implement safety measures across the site.

Education

American Society of Safety Professionals

Certificate in applied technology in safety management 2020–2021

University of Montana | Montana Tech

Bachelor of science, Occupational safety and health 2011–2015

Certifications

Board of Certified Safety Professional (BCSP)

Safety Management Specialist (SMS)

OSHA

Certified Environmental Specialist

OpenLearnOrg

Certificate in safety management

Skills and endorsements

- + Construction safety · 465
Endorsed by **Jane** and **Ryan**, who are highly skilled at this
- + Safety management systems · 410
Endorsed by **Kim** and **Michelle**, who are highly skilled at this
- + Occupation & health · 365
Endorsed by **Marybeth** and **David**, who are highly skilled at this
- + Applied technology · 350
Endorsed by **Tom** and **Canery**, who are highly skilled at this
- + Communication · 274
Endorsed by **Andrew**, who is highly skilled at this
- + Workplace safety · 223
Endorsed by **James** and **John**, who are highly skilled at this
- + Resource optimization · 217
Endorsed by **Riesa** and **Jonathan**, who are highly skilled at this
- + Internet of Things · 200
Endorsed by **Chris** and **Riesa**, who are highly skilled at this
- + Wearables for safety management · 160
Endorsed by **Henry** and **David**, who are highly skilled at this
- + Data analysis · 158
Endorsed by **Suzanna** and **Chris**, who are highly skilled at this
- + Analytical thinking · 150
Endorsed by **Ross** and **Tom**, who are highly skilled at this
- + Project management · 112
Endorsed by **Gordon**, who is highly skilled at this
- + Risk assessment · 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



Venus

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



Symphony

This software suite can connect people, machines, and systems for data-driven digital manufacturing. Using advanced real-time analytics, it helps maximize manufacturing production performance.



InstaCap

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



Share Smart

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



AIEnhance

It is an AI-enabled exoskeleton enhancement that has autonomous work cells with cobots, robotic arms, or robots for execution support.



WeAR

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



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 task.

Decision-making



Smart Dash

This visual display presents data, live information, and analysis, including predictive analytics, from multiple sources to facilitate informed decision-making.



SixthSense

A tool that incorporates machine learning, cognitive computing, and AI to detect macro trends in the broader environment.



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.



Digital requirement toolbox (DRT)

It is a central request repository for digital initiatives and support, which the company's innovation team can use to plan and pilot their digital/smart initiatives.

Learning



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

08:30 AM

After a hectic site visit on Tuesday, Daniel decides to work from home today. Venus logs him into the company network and activates the InstaCap file of yesterday's site visit. Using SixthSense, Daniels runs various scenario iterations and records them in Share Smart. He then forwards this to his site safety controller to incorporate the update in the safety procedure and signage.

09:30 AM

Using Symphony, Daniel connects with Jerry, a digital twin engineer, to discuss their live site in Palm Springs. They have just incorporated AIEnhance there to reduce the presence of human workers in areas with high exposure to asbestos. The company plans to expand it to all the Afility sites. Jerry shows a few mockups highlighting efficiency gains from AIEnhance and its positive EHS impact on site workers. Satisfied, Daniel agrees to full-fledged implementation and signs off on the use of AIEnhance for the company's current and future projects.

10:30 AM

Daniel logs into the HeMoSite dashboard. The company's initiative around automated cranes has reduced incident rates considerably. Daniel is excited to see a 65 percent reduction in drivers' sick leave and zero site incidents in the last two quarters. Crane drivers with existing knee problems have raised no new ailments and their health reports have been faring well. Inspired by the results, Daniel schedules a call with the operational technology and logistics team to discuss a smart fleet initiative for transportation. Venus schedules this call for Friday.

11:00 AM

Daniel's Smart Dash highlights a red flag from the company's European sites. His on-site safety controller was unable to travel to locations due to bad weather. Also, the site has been closed for the past two days. Although no human workforce is stranded, the site's regular checkup has been delayed by three days. Daniel faces this issue at many European, Northern, and Northeastern sites during winters. Afility's innovation team is working with Daniel to pilot an automated inspection tool, which can help them to inspect sites in remote or difficult terrain. Seeing an opportunity, he connects with them to test their pilot on this site.

11:30 AM

The innovation team, using the sensors and cameras from smart machinery at the European site and WeAR, generates a live stream of the location. The stream is uploaded on Daniel's computer as well. The live reporting stream shows zero incidents and raises no flags. However, Daniel realizes if they can install some temporary harmonic and heat sensors around this site, the automated inspection tool would be more robust. He records his requirements and findings in the DRT.

02:30 PM

Venus reminds Daniel about his call with the operations team. They will be discussing implementing robotic arms for maintenance and repair. Using these arms and AuRo, the company plans to assist on-site teams in repairs and, in turn, reduce downtime. Daniel needs to supervise them around EHS standards, as he is responsible for all the machines operated on the site. The operations team, along with Daniel, is launching the robotic-arm pilot on the 15th of next month. For this simulation, they will be using inputs from Envision and perform scenario testing. Results of this test can help Daniel create a safer environment for site workers, as they will be able to maintain a safe distance from malfunctioning or inoperative machines, and still repair those machines.

03:30 PM

Daniel logs into the HeMoSite to read the worker dashboard, which is a repository of the data collected daily via site workers' smart helmets and connected jackets. The data shows that all workers are done with their shift and are ready to leave. The dashboard helps Daniel to be prescriptive if needed and helps the company maintain a healthy workforce. Reports also highlight the various tasks workers undertook, which helps Daniel plan the next day's tasks. He also uses the data to raise any health violations and monitor stressful working conditions.

04:00 PM

As the day closes, Daniel starts getting daily reports from the site safety controllers. His attention is drawn to the Big Bear Lake site, where the weather forecast predicts snowfall tonight. The drones there are already up for night surveillance and none of the elevators' sensors show any movement. Daniel recalibrates all the smart machinery of that location to auto-sleep mode in case of snow. He records his findings in the company's central database before he logs off for the day.

About the authors

PAUL WELLENER is a vice chairman, Deloitte LLP, and the leader of the US Industrial Products & Construction practice with Deloitte Consulting LLP. He has more than three decades of experience in the industrial products and automotive sectors, and has focused on helping organizations address major transformations. Wellener drives key sector industry initiatives to help companies adapt to an environment of rapid change and uncertainty—globalization, exponential technologies, the skills gap, and the evolution of Industry 4.0. Connect with him on LinkedIn at <https://linkedin.com/in/pwellener/>.

BEN DOLLAR is a principal in the Global Supply Chain practice of Deloitte Consulting LLP. Dollar has helped some of Deloitte's largest defense, automotive, and industrial products manufacturing clients achieve tangible benefits through organization design, process adoption, and human capital management. Connect with him on LinkedIn at <https://www.linkedin.com/in/ben-dollar-1018aa/>.

LUKE MONCK is a senior manager in the Human Capital practice. Monck has more than 13 years of experience leading large-scale organizational transformation initiatives for Fortune 100 companies, focusing on automotive, A&D and chemical manufacturers. He designs and delivers the operating model/organizational design, talent, and change management solutions that business transformations require to be successful. Connect with him on LinkedIn at <https://www.linkedin.com/in/luke-monck-51885949/>.

HEATHER ASHTON MANOLIAN leads industrial manufacturing research in the Deloitte Research Center for Energy and Industrials. Manolian has delivered compelling insight for manufacturing executives on major enterprise business and technology trends for more than 20 years. Her expertise includes developing thought leadership at the intersection of business and technology, and covering emerging technologies from cloud to blockchain and augmented reality. Connect with her on Twitter at [@hashtonmanolian](https://twitter.com/hashtonmanolian) and on LinkedIn at <https://www.linkedin.com/in/heather-ashton-manolian-6241b78>.

AIJAZ HUSSAIN leads the aerospace and defense sector research for Deloitte US and serves as the principal adviser to the A&D national sector leadership and the practice. Hussain has more than 17 years of experience in research, thoughtware development, market/competitive intelligence, business strategy, and financial analysis. He has authored numerous compelling and high-impact thought leadership studies in the areas of operational performance, growth outlook, innovation, digital, elevated future of mobility, and program management. Connect with him on LinkedIn at <https://www.linkedin.com/in/aijazshaikhussain/>.

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Contacts

INDUSTRY CONTACT

Victor Reyes

Managing director
Deloitte Consulting LLP
+1 571 766 7433
vreyes@deloitte.com

DELOITTE RESEARCH CENTER FOR ENERGY AND INDUSTRIALS

Katherine Hardin

Managing director
Deloitte Research Center for Energy & Industrials
+1 617 437 3332
khardin@deloitte.com

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Editorial: Rithu Thomas, Anya George Tharakan, and Preetha Devan

Creative: Rajesh Venkataraju and Kevin Weier

Promotion: Nikita Garia

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