

The future of work in manufacturing

What will jobs look like in the digital era?

SMART QA MANAGER

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Summary

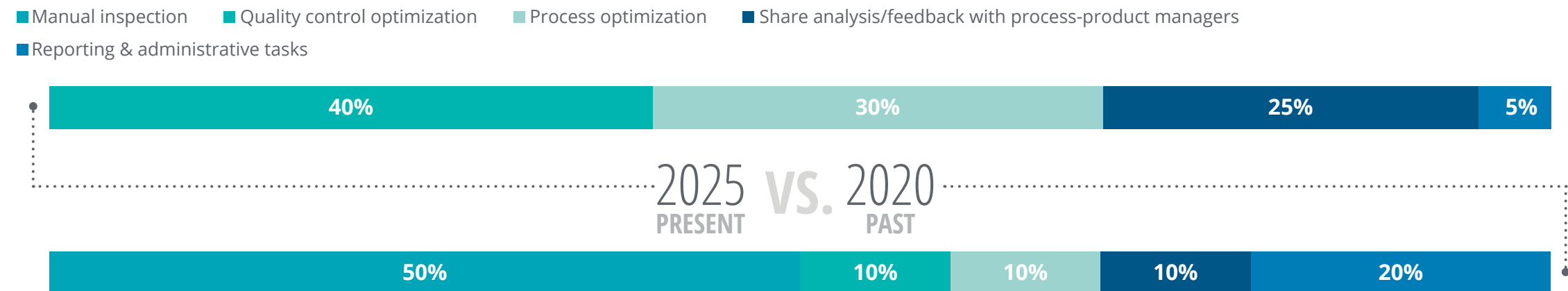
It is 2025. The manufacturing industry has automated production processes and assembly lines. Quality control, which relied on human inspection and intervention, is now an automated, intelligent process enabled by vision systems and real-time analytics. A “smart quality assurance (QA) manager” manages product quality, making full use of digital technologies. This role oversees an ecosystem of machine and work center sensors, artificial intelligence (AI)/machine learning (ML)-powered analytics dashboards, and virtual reality (VR) support technologies. This enables the smart QA manager to proactively detect quality escapes and machine maintenance issues and develop solutions to address the root causes of quality issues.

The smart QA manager is conversant in all quality-related use cases of their smart factory. They “train” the quality systems by developing requirements for AI/ML algorithms that identify defects as early as possible, minimizing the cost of quality and maximizing facility yield and profitability. The smart QA manager also works to reduce the number of defects per part produced as well as substantially reduce the disruptions to the production schedule, minimize production downtime, and maximize workforce productivity by reducing manual inspection.

Responsibilities

- Works with enterprise and facilities integration data scientists to develop requirements for quality-related use cases. Uses historical data to develop predictive quality controls and detection algorithms.
- Works with the facility manager to develop and oversee the process by which product is rapidly rerouted to alternate work centers to maintain production schedule.
- Conducts quality issues root cause analysis by leveraging a combination of data analytics and manual investigation techniques. Provides corrective actions to manufacturing and industrial engineering functions.
- Develops and oversees the facility quality program—leveraging immersive and VR technology to train facility personnel on preventative activities, early detection of quality risks, and troubleshooting.
- Identifies new technologies to incorporate into QA systems, piloting newer systems for early detection.

Time spent on activities





ZARINA MARTI

Smart QA manager

Keisha Manufacturing Pvt. Ltd. | Chicago (IL), US

An experienced QA manager trained in leveraging smart technologies to reduce the number of defects per part produced and help enhance overall productivity of the firm.

Experience

Smart QA manager

Keisha Mfg Pvt. Ltd. *December 2022–present* | 2 years 7 months
Core responsibility includes reducing the number of defects per part produced by using a host of smart tools and technologies, leading to minimized production downtime and maximized asset and workforce productivity.

Product quality manager

Keisha Mfg Pvt. Ltd. *January 2020–November 2021* | 1 year 11 months
Automate the quality control measures and develop robust fault detection techniques. Streamline the detection and control measures across different production lines for all Keisha’s factories.

Technical quality environmental (TQE) manager

Keisha Mfg Pvt. Ltd. *January 2016–December 2019* | 3 years
Responsibility includes leading the quality management work and developing stringent quality control measures to streamline the production process.

Quality manager

Blight Lites Pvt. Ltd. *October 2009–December 2015* | 6 years 3 months
Key responsibility includes coordinating with all the stakeholders, from the period of preparing the prototype until the dispatch of the final products, making sure all products meet the quality criteria.

Education

Northwestern University—McCormick School of Engineering

Master of science—Engineering design innovation
2007–2008

Northwestern University—McCormick School of Engineering

Bachelor of science—Electrical engineering
2003–2007

Certifications

6SIGMA

Lean Six Sigma Black Belt in operational excellence

INTM Certificate Program

Industrial sustainability

INTM Certificate Program


Manufacturing technology

OpenLearnOrg


Collaborating for results

Skills and endorsements


+ Operational excellence · 430

 Endorsed by **Daisy** and **Meera**, who are highly skilled at this


+ Deep learning · 412

 Endorsed by **Josephine**, who is highly skilled at this


+ Innovation · 350

 Endorsed by **Tina** and **Melissa**, who are highly skilled at this


+ Automation · 324

 Endorsed by **Gregory** and **Daniel**, who are highly skilled at this


+ Digital prototyping · 246

 Endorsed by **Tom** and **Kiara**, who are highly skilled at this


+ Industrial technology · 195

 Endorsed by **Edward** and **Lee**, who are highly skilled at this


+ Client management · 186

 Endorsed by **Farida**, who is highly skilled at this


+ Collaboration · 85

 Endorsed by **Danny** and **Ruby**, who are highly skilled at this

+ Change management · 79

 Endorsed by **Jennifer**, who is highly skilled at this

+ Project management · 68

 Endorsed by **Diana** and **Marry**, who are 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.

Smart use case



Gen-4 production facility: Next-gen manufacturing facility with AI driven robotic and cognitive process automation.

Smart conveyance: Automated guided vehicles and conveyance systems to ensure continuous material flow.

RTD tower (quality sensing and detection): Real-time quality sensing and error detection using an array of sensors and vision systems.

Productivity



Venus

This AI-powered, voice-enabled digital assistant provides a conversational interface for all productivity-related tasks, from scheduling to finding answers and checking the status of projects and people.



Share Smart

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 product, supply network configuration, or assembly line right the first time.



VirtuMeet

This AR smart-glass conference room with AI capabilities allows global partners to meet and collaborate, overcoming the barriers of physical separation. With built-in AI, AR screens can present short bios or other relevant information about attendees as the user pans across their faces.



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.



CrowdWise

This online dashboard collects textual data from all the social websites a company uses for feedback, complaints, and issues using text mining and Web scraping. It then creates word clouds and, with the help of perception mapping, highlights the customer sentiment around the company's product and services.



ARM

Augmented reality monitoring to support pick-by vision, mentoring and training, sending or receiving work instructions. This tool helps in cross-location and cross-team trainings.

Decision-making



Smart Dash

A visual display that presents data, live information, and analysis 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.



Orderectory

An order directory dashboard for inventory levels across different warehouses and facilities, instrumental while forecasting demand and production information.

Learning



ELWIE

(enabling learning, well-being, (personal) interest, and (overall) excellence) It's a mobile bot and a personal smart well-being assistant that takes care of professional and personal well-being. It can suggest new learning opportunities as well as help to plan vacations or leaves based on personal interests.



Career Coach

This personal bot performs strengths assessments and understands the broader talent situation at the company. It uses AI to suggest different career pathways and coordinate with the SkillsPro training course to create a program for the user to accomplish their pathway. It also links in real time to the talent management system at the company to alert the user of job openings and opportunities for advancement.

A DAY IN THE LIFE

06:30 AM

Zarina's alarm goes off. Her day is packed with meetings. Venus knows it and aptly activates the coffee machine to help Zarina get much-needed energy for a bright start to the day.

07:00 AM

As Zarina pours her hot cup of coffee, Venus starts reading out her emails and meeting invites. She has a meeting with Jack, a product manager, in the next 30 minutes to discuss a product customization request. Zarina opens the Share Smart file already shared by Jack to understand the client's design requirement. Using Envision, she runs a few simulations with the new design parameters and records the machine operating variables. Confident about the results, she logs in for the meeting. Zarina shares the expected product properties and proposes the new operating variables for the machine. Happy with the results, Jack finalizes the design and gives Zarina a go-ahead. Zarina downloads the design from Envision and shares it with the production team using Share Smart.

08:00 AM

Zarina next connects with Kim, a lead data scientist in the R&D team, using VirtuMeet to develop preventive quality measures for their new gen-4 production facility. They have been working on this initiative for a week now, wherein data from existing RTD towers and smart conveyance technologies from Keisha's other facilities is being analyzed to develop Kaizen 2.0, a zero-defect and completely customizable production line. During the meeting, Kim and her team propose a few preventive methods to further reduce error probability. Zarina's team uses Keisha's factory digital twin to develop a new floor layout plan and test it for quality tests and assurance. As she logs off from the meeting, Elwie reminds Zarina about her brunch plan with Samuel, her future intern, who is excited to join the Keisha internship program.

08:30 AM

Zarina will be working from Gibson's facility today to test the product customization she earlier worked on with Jack. Since it is an hour-long drive to the facility, Zarina requests Venus to make a 9:30 AM reservation at a nearby restaurant. On her way to the restaurant, Zarina asks Venus to summarize CrowdWise dashboard to her—in order to understand market sentiments around Keisha's products. She learns that a few customers showed some apprehensions about their rubber tubes. Zarina assigns Vishal from her team to investigate the issue and develop the InstaCap file to be shared with the product design team.

09:30 AM

Zarina reaches the restaurant, where Samuel awaits her. Over brunch, Zarina informs Samuel about some of the new things she is working on. Samuel listens intently.

10:30 PM

Zarina takes Samuel directly to their gen-4 production facility with smart conveyance belts. She highlights how the belts have a 7D-dimension measuring sensor array to qualify product quality not only based on height-width-breadth but also on density, cuts and curvatures, flexibility, and light deflections—ensuring 99.99 percent quality assurance. She also takes Samuel through the RTD towers where real-time information from the 7D sensor array is analyzed and deviations are flagged—indicating noncompliant measures. She explains how this technology helps them to prevent quality issues with their pilot products. This pilot phase is the key to zero errors when the product is mass-produced. Next, she shows how the final products, before packaging, are passed through spinners and two additional scanners for a final durability test. She informs Samuel that he will be working with the AI quality team to further enhance their ML capabilities.

12:00 PM

Zarina leaves for the Keisha HQ. On the way, she instructs Venus to display the Orderectory dashboard on the windshield of her self-driving vehicle. The data includes inventory updates of the warehouses and production facility in the northwestern area. She cross-verifies with the production team and shares the calibration details for quality sensors and components with her team.

01:30 PM

In her working lunch session, Zarina and Michael (a lead product engineer) refer to past quality control algorithms and brainstorm a custom product design process. After an hour-long discussion, they finalize the metrics and set up the ARM meet with Michael's team. During this meeting, Zarina will be sharing the custom design process they just developed and other success stories with Michael's team.

03:30 PM

Zarina finishes analyzing the results from the scan of last pilot batch. Her team has given a green signal, but she notices certain deviations. She senses a need for her team to take a refresher course in detection techniques. She sends a Career Coach meeting invite to her team members. Before logging off for the day, Elwie updates her on missed physical activity target and books a fitness class. Satisfied, Zarina logs off and leaves for the gym session.

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. Based in Cleveland, Wellener also serves as the managing principal of Northeast Ohio. Connect with Wellener on LinkedIn at <https://linkedin.com/in/pwellener/>.

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