ptc

Reducing Scrap and Rework with AUGMENTED REALITY

How Industrial AR Is Saving Manufacturers Millions

Scrap, rework and waste have long been regarded as an inevitable byproduct of the manufacturing process.

Industrial organizations constantly seek out continuous operational improvements an eye for marginal reductions in waste. But the conventional wisdom has held that a near-zero level of waste is out of reach, and it is impossible to totally eliminate waste, defects, and, scrap. Despite advances in automation and precision, challenges have also increased as manufacturing operations and products have changed:

- Manufacturing processes have become increasingly complex
- Process complexity is a result of product complexity and variation
- Environmental and regulatory compliance is stricter than ever before
- Production speeds have accelerated to meet markets with on demand expectations
- Work instructions are often difficult to interpret and maintain
- High workforce turnover can lead to inconsistencies in product quality
- Global distribution of value chains exacerbates challenges to lean manufacturing

Because of these challenges, manufacturers cannot afford to be complacent. Assembly errors that result in defects, rework, and scrap are not only expensive—they can also delay production schedules and have liability, regulatory, and compliance implications. With margins and performance under intense scrutiny, even the slightest reductions of scrap and rework can have a substantial impact to the bottom line.

According to *Forbes*, the cost of poor quality can range between 10 to 20% of most manufacturing companies' total revenue.

Even the top performing organizations spend 0.6% of sales on scrap and rework.

—Supply & Demand Chain Executive

High operating costs have made workforce efficiency a critical component in manufacturing.

It's imperative that frontline workers take the necessary precautions to optimize production runs. Human error can result in several types of manufacturing waste, causing industrial organizations to leave millions on the table each year.

If a line isn't properly cleaned or the wrong assembly component is embedded into another system, the entire run may need to be recalled. As a result, any materials used or time spent on that run are lost.

Many manufacturers attribute **lost revenue and resources** to:

- Large amounts of scrap, rework, and waste
- Slow machine setup or line changeover times
- Production errors resulting in defective products
- Warranty claims as a result of poor quality
- Quality issues delaying product deliveries
- Inability to meet increasing customer demand
- Inability to adhere to safety and compliance regulations
- High labor and overtime costs

Waste is resources that are lost due to inefficient or non-essential activities, including any material that cannot be reconstituted.

Scrap is a specific form of waste consisting of excess material discarded from the manufacturing process.

Defects occur when production deviates from a product's design specifications, resulting in products that are unfit for their intended use.

Spoilage is an accounting term that refers to the amount of scrap or waste that is caused by production.

Rework is the correcting of defective, failed, or non-conforming products.

Standardizing instructions and operating procedures in order to minimize waste can generate millions in potential annual savings per facility. Less scrap and rework means lower operating costs and higher margins, in addition to reducing a company's impact on the environment.

Augmented reality can help manufacturers reduce waste and minimize costs by empowering frontline workers with on-the-job procedural guidance and more effective training. With a combination of better, clearer in-context work instructions, SOP documentation, and access to remote experts, companies can cut back on manufacturing mistakes that cost them millions in lost revenue and resource allocation.

Defining **INDUSTRIAL AUGMENTED REALITY**

Augmented reality blends the physical and digital worlds together by overlaying in-context 3D digital content onto physical objects or environments. In the industrial setting, manufacturers can use AR to provide operators and technicians with standardized instructions and operating procedures, so they can perform complicated tasks quickly and accurately, the first time.

- More effective and easier-to-manage than traditional training methods, AR-driven training increases competency for frontline workers—resulting in better line flexibility, faster onboarding, and higher yields with fewer mistakes.
- With AR, manufacturers can standardize and streamline tasks such as machine setup and changeover, operation and assembly, and maintenance—resulting in more productive workers and less errors and downtime.

AR APPLICATIONS that Reduce Scrap and Rework:

Superimposing relevant information onto a frontline worker's field-of-view ensures that they know how to accurately complete tasks such as machine setup and changeover during the exact moment they're performing them. There are several AR applications that are useful for this purpose.

3D work instructions
leverage CAD models and real-time IoT data to increase worker comprehension and improve safety during complex tasks.

Augmented step-by-step guidance
enables frontline workers to leverage the domain expertise of subject matter experts via a location-specific, first-person view of standard operating procedures.

Remote assistance
connects field technicians and frontline workers with qualified experts for over-the-shoulder support to help solve unfamiliar or unexpected equipment problems.

GLOBALFOUNDRIES
Is Reducing Scrap and Rework with AR

Augmented reality is quickly becoming the technology of choice for industrial organizations that want to reach new levels of workforce efficiency. PTC's Vuforia Expert Capture is helping several of these companies reduce the costs associated with scrap and unscheduled downtime with hands-free procedural guidance that helps frontline workers accomplish tasks quickly, accurately, and safely—on the first try.

One global high-tech manufacturer is currently using Vuforia Expert Capture to lower their scrap and rework costs by a potential **$15 million per facility**. With very few tasks standardized due to the time-consuming nature of SOP documentation, they needed a scalable solution that would enable them to provide operators with the necessary guidance to complete tasks successfully.

With Vuforia Expert Capture, GLOBALFOUNDRIES was able to:

- Reduce scrap and rework by 25%
- Shorten authoring time for documentation by 50%
- Accelerate training time by 40%
- Minimize unscheduled downtime by 28%

"As soon as we saw the capabilities of the product, we knew that we wanted to jump on it right away"

– Zachary Lanahan from GlobalFoundries on the Vuforia Expert Capture prototype phase

GLOBALFOUNDRIES is a full-service semiconductor foundry with fabrication facilities across the globe. Headquartered in Silicon Valley, GLOBALFOUNDRIES delivers CMOS, RF, ASICs, and Silicon Photonics technologies to a range of markets that include mobility, automotive, communications & data, IoT, and aerospace and defense.

With no pre-existing materials required to build effective AR-based training and instruction experiences, **Vuforia Expert Capture** is the fastest and easiest way to transform your bottom line by reducing scrap and rework.

CONTACT US TODAY

to learn more about **Vuforia Expert Capture.**

LEARN MORE

Deliver compelling AR experiences that leverage the richness of 3D and insights from the IoT with **Vuforia Studio**, or bring your technicians and experts together with **Vuforia Chalk** to solve problems faster.