

MANUFACTURING TRENDS

WITH COUNCIL OF INDUSTRY STAFF

FROM PRODUCT DESIGN TO
PRODUCTION TO SALES AND
CUSTOMER SERVICE

AUGMENTED REALITY

(AR) IS IMPACTING ALL
ASPECTS OF MANUFACTURING

The Industrial Internet of Things (IIOT) is already dramatically changing the economic landscape, however, we have barely scratched the surface of its potential. The amount and quality of the data collected by connected devices is far outpacing our ability to interpret and utilize it.

The cause of this bottleneck keeping us from taking full advantage of the almost limitless information contained within the data is the inability of humans to assimilate that data, and act upon it in meaningful ways. One tool to remove that bottleneck may be augmented reality.

In "A Manager's Guide to Augmented Reality" which appeared earlier this year in *The Harvard Business Review*, Michael Porter, a Harvard University professor, and James Heppelmann, chief executive of PTC Inc., an industrial consulting company write: "There is a fundamental disconnect between the wealth of digital data available to us and the physical world in which we apply it. While reality is three-dimensional, the rich data we now have to inform our decisions and actions remains trapped on two-dimensional pages and screens."

WHAT IS AR?

Augmented Reality (AR) is interactively experiencing a real-world environment where the objects are enhanced by computer-generated perceptual information. This is most often a visual experience, however, other modalities are sometimes employed, such as auditory, somatosensory, and olfactory. Unlike Virtual Reality (VR), which makes you submerge yourself in a virtual

environment, AR is all about augmenting the present reality with technology.

The technology is in its early stages. Today, most AR applications are focused on entertainment and delivered through smartphone and tablet apps. Perhaps the most commonly recognized example was the Pokémon Go craze a few years back. That game uses location tracking and mapping technology to create an augmented reality where players catch and train Pokémon characters in real locations. But, AR technology is increasingly being used in commercial and industrial applications. And, in addition to smartphones and tablets, it is delivered through hands-free devices such as AR smart glasses, head-mounted displays, and displays in cars.

From big corporations like Council Member IBM, who is using AR to help customers visualize complex data, to Apple, who is investing not only in their own AR framework but also navigation tech, to Google, who announced earlier this year that is rolling out an AR version of Google Maps, the potential of AR is attracting big interest and big money.

"By superimposing digital information directly on real objects or environments, AR allows people to process the physical and digital simultaneously, eliminating the need to mentally bridge the two," Porter and Heppelmann write. "That improves our ability to rapidly and accurately absorb information, make decisions, and execute required tasks quickly and efficiently."

APPLICATIONS OF AR IN INDUSTRY

Manufacturers can look to AR to help them access, interpret, and use data and information in various ways including to visualize, to instruct and guide, and to interact.

VISUALIZATION

According to Porter and Heppelmann “AR applications provide a sort of X-ray vision, revealing internal features that would be difficult to see otherwise.” Medical device manufacturer AccuVein, for example, uses AR technology that converts the heat signature of a patient's veins into an image superimposed by a device onto the skin, improving the success rates of blood draws and other vascular procedures.

INSTRUCT AND GUIDE

For industry this is one of the most important applications of AR. It can provide real-time, step-by-step visual guidance on product assembly, both for consumer and industrial applications. Installing electrical wiring on an aircraft is a complex task that leaves zero room for error. Boeing is using augmented reality to give technicians real-time, hands-free, interactive 3D wiring diagrams - right before their eyes.

“A person working in an industrial setting has a lot of distractions in that environment and a lot of data to think about and process. Traditionally technicians had to look at and interpret a two-dimensional twenty-foot-long drawing and construct that image in their mind and attempt to wire based on this mental model,” said Brian Laughlin, IT Tech Fellow at Boeing. “By using augmented reality technology, technicians can easily see where the electrical wiring goes in the aircraft fuselage. They can roam around the airplane and see the wiring renderings in full depth within their surroundings and access instructions hands-free.”

INTERACT

“AR takes the user interface to a whole new level. A virtual control panel can be superimposed directly on the product and operated using an AR headset, hand gestures, and voice commands it,” write Porter and Heppelmann.

One key area where this hybrid-tech can be applied within the manufacturing industry is in the field of robotics and automation. New York University engineers have created a platform to control robot arms through augmented reality. Another platform that has emerged from NYU overlays different environments with virtual robots - except these robots actually exist in the real world, in the very environment that is being examined. The goal is to effectively allow operators to monitor and control a swarm, or a large number of robots as a single system. Unlike conventional systems that require hefty infrastructure and investment, this system can run on an iPad.

Such innovations will take swarm robotics from being a feature of giants like Amazon to being a technology accessible to the “manufacturing masses.”

AR is having an impact on just about all aspects of a product's value chain.

In product development, AR allows realistic 3-D models to be superimposed on the physical world as holograms, helping engineers evaluate and improve designs. Radius Innovation & Development, product design consultants, have already seen tangible examples of what AR brings to their creative process. Rapid visualization, accelerating time-to-market and adding new dimensions to the way they collaborate with clients.

“With emerging technologies like additive manufacturing, a part can undergo 19 design iterations in the time it would take for one iteration using traditional development methods. Adding AR as a tool in the prototyping mix can seize even more potential.” Writes Jim Holtorf, Radius Innovation & Development's Managing Director.

In manufacturing, where processes are often complex and mistakes are costly, AR can deliver just the right information to factory workers



VALUE YOU CAN COUNT ON

Business is unpredictable. Markets shift. Competitors evolve. Customer expectations change.

Today most organizations have come to expect the unexpected, but our clients know there's one thing they can always count on. Us.

PKF O'Connor Davies is a new breed of accounting and advisory firm that holds itself to a higher standard – going beyond passive value calculation to active value creation for leading business owners, organizations and individuals in the US and abroad.

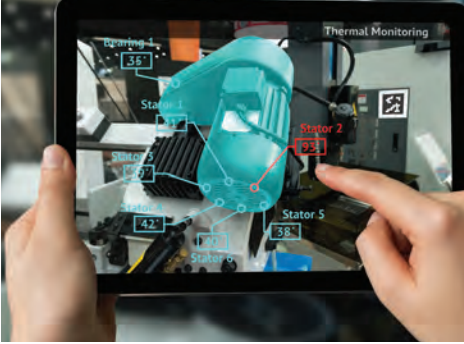
While others may falter amid constant change; we consistently deliver. Advice you can count on. Service you can count on. **Value You Can Count On.**



Alan Marks, Partner
845.565.5400
amarks@pkfod.com

Wayne L. Martin, Partner
845.670.7151
wlmartin@pkfod.com

www.pkfod.com



the moment it is needed, while making visible important data about each machine, thus reducing errors, improving productivity and preventing downtime.

The area of quality assurance (QA), for example, offers numerous potential applications for AR. Last year, SlashGear reported on a pilot program running at a Porsche assembly plant in Leipzig, Germany. Porsche technicians are using augmented reality as a tool in the quality assurance process. Quality professionals can take photos of parts or assemblies on vehicles under inspection, and then compare those images to ones provided by the company's suppliers via an augmented reality overlay. Features that are out of specification can be highlighted by the overlay, enabling the Porsche technicians to identify the issue quickly and intuitively.

The gap between someone's expectations and reality is a persistent problem in sales and marketing. AR can show customers how products will look in their homes or other settings before they buy. Far too often, customers have a very different belief about what the product should be and what they receive. This unfortunate process leads to disappointment, inaccuracy, and painful revisions. In other words, what the customer wants and what the company can do are often two incredibly different things. Buyers love endless customizable

products and options. Not every manufacturer can keep up with uniquely tailored goods for each customer. That's why augmented reality and 3D visualization should play a vital role in the sales process.

Atlatl Software, a cloud-based sales platform, says that visual configuration helps increase sales efficiency by 24%. "Manufacturing is ripe for disruption from 3D and AR technology in the sale process because it allows customers to be immersed in a complex product without the time and expense that is tied to a physical product in brick and mortar environments," said Atlatl Software CEO, Marc Murphy.

Murphy believes that sales play an integral role in the IIOT and it forces manufacturers to ask themselves how their investments are effectively changing the purchaser's buying experience.

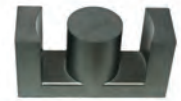
"While the advances in artificial intelligence and robotics are impressive, we believe that combining the capabilities of machines with humans' distinctive strengths will lead to far greater productivity and more value creation than either could generate alone," Porter and Heppelmann conclude. "What's needed to realize this opportunity is a powerful human interface that bridges the gap between the digital and physical worlds."

Augmented Reality is the historic innovation that might provide that breakthrough.



Fair-Rite Products Corp.

Your Signal Solution®



WE ARE GROWING

- Are you...
- Ambitious
 - Confident
 - Reliable
 - Positive
 - Committed

Does this describe you? Please visit our website for opportunities or stop in and fill out an application.



We Want You to Join the Fair-Rite Team

Our Mission...

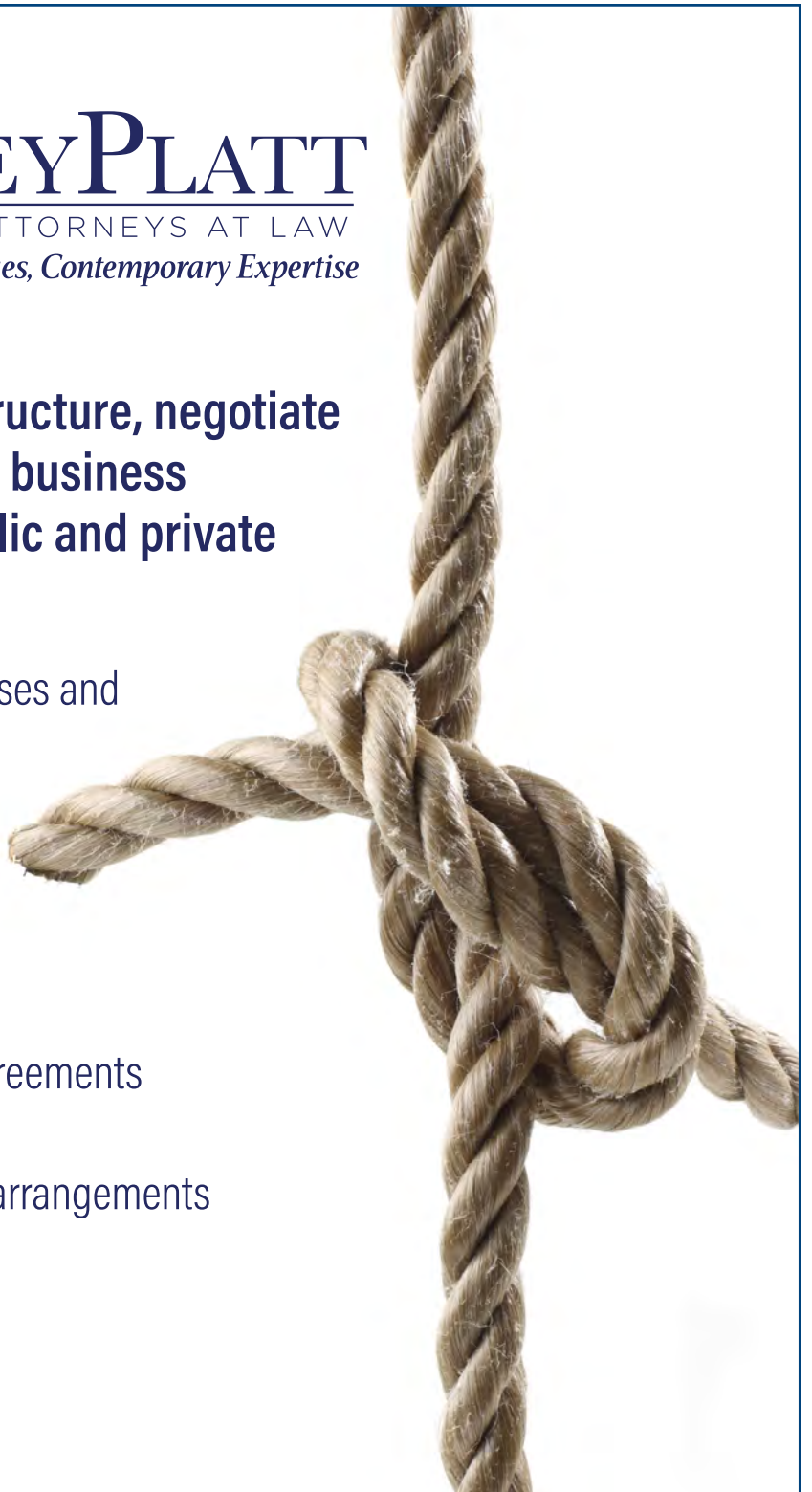
We, a team of dedicated professionals, create the finest ferrite products and innovative solutions for the global electronics industry, with the commitment to improve the future for our customers, our company, our families, our community and ourselves. WE ARE COMMITTED!

Phone 845.895.2055 | Fax 845.895.2629 | www.fair-rite.com | 1 Commercial Row, Wallkill NY 12589



Our corporate attorneys structure, negotiate and implement a variety of business transactions involving public and private institutions, including:

- Mergers, acquisitions, purchases and sales of stock and assets
- Corporate finance
- Commercial transactions
- Partnership matters
- Franchise activities
- Joint ventures and leasing agreements
- Stockholder agreements and other ownership contractual arrangements
- Venture capital
- Executive employment and severance arrangements



WWW.BPSLAW.COM
ATTORNEY ADVERTISING

NEW YORK • 1 NORTH LEXINGTON AVENUE | WHITE PLAINS, NY 10601 • PHONE: 914-949-2700
CONNECTICUT • 25 FIELD POINT ROAD | GREENWICH, CT 06830 • PHONE: 203-422-5050