



Hear from the Leaders of the Digital Revolution:
AME San Diego 2018 will feature several presenters that are leveraging technology to increase employee engagement and productivity.



Developing the next generation of digital knowledge workers

How the latest technologies increase the competitiveness and productivity of your employees – and your organization

BY GLENN MARSHALL

With the arrival of the Digital Age, companies are embracing the emerging “no-collar” workforce by re-designing jobs and reimagining how work will be done in a hybrid human-and-machine environment, according to the Deloitte Global Human Capital Trends report.

As workers and their companies acclimate to this new work environment, organizations and the people who work for them are looking for opportunities to leverage technology and automation to streamline

Digital Reality Technologies

Augmented reality (AR): Overlays digitally created content into the user’s real-world environment. Features include transparent optics and a viewable environment in which users are aware of their surroundings and themselves.

Virtual reality (VR): Creates a fully rendered digital environment that replaces the user’s real-world environment. Features body- and motion-tracking capabilities.

Together, these technologies will likely provide workers with an “always on” connection to the Internet or enterprise networks. Further advances in design and the underlying technology are giving rise to a new generation of comfortable, self-contained digital devices free of tethering wires or bulky battery packs.

or even eliminate the tasks workers now perform. Top priority is reconfiguring workflow processes, so that both humans and the technologies each do what they do best. They’re trying to differentiate the work that requires the skills that only humans have, such as ethical or creative thinking, from the rote, repetitive tasks that machines can perform. In addition, they’re identifying ways that technology

can augment human skills. The result will transform the workplace—and the worker.

In this culture, management will—or should—begin to recognize human workers for their creativity and social contributions, rather than their throughput (since most throughput tasks will be automated). As well, leaders will empower human workers to improve the productivity of their electro-mechanical co-workers.

As organizations better understand how to leverage the new digital technologies, they will redesign jobs by identifying opportunities for human augmentation and developing new digital automation strategies.

Building this new workforce of knowledge workers requires deliberate planning. One company leading the way toward this “no collar” future is Newport News Shipbuilding. It has addressed some early challenges and put in place the resources and governance to ensure all elements of the hybrid workforce successfully addresses the challenges of the Digital Age.

Digital Reality and Industry 4.0

The coming digital revolution involves several, interrelated technologies, namely “digital reality” technologies and “smart” or “connected” technologies, also known as “Industry 4.0.”

Advances in digital reality—an umbrella term for augmented reality (AR), virtual reality (VR), mixed reality and other immersive technologies—are leading to more natural and intuitive ways to increase the productivity of knowledge workers and the competitiveness of organizations. By combining voice, body and object positioning capabilities, these technologies enhance how employees interact with data, software applications, and their surrounding environments. As a result, companies are shifting their focus from experimenting with “shiny object” AR and VR devices toward building mission-critical applications in the enterprise, according to the International Data Corp. (IDC).

AR spurs innovation

Newport News Shipbuilding is pioneering ways to exploit augmented reality applications to transform the way it develops, produces and maintains products. Shipbuilding has been the perfect environment for industrial innovation for hundreds of years. From sails to steam, wood to iron, rivets to welds, blueprints to CAD, stick-built to modular construction, shipbuilding has played a role in all major innovations in building extraordinarily complex vehicles.



AR is much easier to understand once experienced. It overlays digital information onto the physical world through a window—like an iPad.

AR technology is fundamentally a breakthrough communications medium, contended Dexter Lilley, COO of Index AR Solutions, which was founded by former executives from the shipbuilding company and is currently teaming with it to create new commercial AR applications.

One of the primary ways Newport News Shipbuilding is using AR is to replace drawings and paperwork packages. In one example, the company developed an AR tool that eliminates reliance on stacks of drawings to locate the temporary

steel—nearly 100 tons of it—used during the construction of the aircraft carrier.

Mobile AR technologies can create solutions that include step-by-step instructions using visual overlays of the right information on equipment, machine and panel operations, which provides seamless and timely transfer of knowledge and key points to workers on the job. They visually enhance a worker’s access to information required to perform a job including steps, cautions, knowledge from expert workers, schematics and any other digitized data.

In shipbuilding, the number of potential applications is enormous, including comparing a digital 3D product model to its physical counterpart; planning and training for future work; creating step-by-step maintenance instructions; and highlighting potential safety concerns. AR delivers more information in an intuitive way—making every shipbuilder and sailor more knowledgeable and capable.

Augmented reality should be employed first in places where it creates the most value, which can be subjective. Sometimes, it is best used to help people become more efficient and work more quickly; sometimes this is about helping people to reduce errors and rework; and sometimes it is all about improving safety. ●



The USS Gerald R. Ford, the Navy’s next-generation \$13 billion aircraft carrier, is a pioneer in many ways: It’s the first of its kind to be designed by using a full-scale digital 3D model. It will save more than \$4 billion in total ownership costs during its 50 years of service and operate effectively with 700 fewer crew members than its predecessor.

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