The augmented operator: attracting the workforce of the future

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THE AUGMENTED OPERATOR: ATTRACTING THE WORKFORCE OF THE FUTURE

Frontier technologies that augment the role of the operator will help attract digitally native generations into the future industrial workforce, says Steve Royston, ABB.

The workforce is the beating heart of any organisation. Yet attracting skilled workers to industrial sectors, such as oil, gas and manufacturing, is an ongoing challenge, one exacerbated by an aging workforce and increasing competition from the tech sector. In fact, 73% of engineering companies report talent gaps, according to Bain & Company. This divide, it warns, will widen as baby boomers retire more quickly than new graduates fill their shoes.

This is why industry must start preparing for the workforce of the future today if it is to attract and retain the skills it will need tomorrow. This is a challenge ABB has been working to address for some time. We believe augmenting the role of the operator with frontier technologies such as Artificial Intelligence (AI) and machine learning to better reflect the characteristics, talents, and expectations of the future workforce will be key to recruiting them.

Preparing for the next generation

Generation Z (born between 1997 and 2012) are coming up the pipeline and are expected to account for around 27% of the workforce by 2025. Right behind them is Generation Alpha (born early 2010s and the early-to-mid 2020s). These generations are often referred to as “digital natives” because for them, unlike those before – Baby Boomers, Generation X and to some extent Millennials – the internet and digital devices have always existed.

Therefore, these emerging generations are extremely online; they turn to the internet for information instead of paper manuals. They flit between apps, social media feeds and personalised online content. And research shows Gen Zers value salary much less than previous generations, instead equally attracted to remote working, job satisfaction and skills expansion. They are also much more environmentally aware, seeking out sustainable companies. If organisations want to attract these generations, they must start evolving today.

Augmenting the workplace for future workforces

The role of the operator must be transformed to reflect these generations inherent abilities and everyday experiences. By harnessing new and emerging technologies, such as AI, machine learning and advanced analytics, the job of an operator can be ‘augmented’ for a more immersive, digitally enhanced, and rewarding experience.

For example, increasing autonomy within the distributed control system (DCS) will reduce the time the next generation of operators will need to focus on day-to-day operations. Instead, they can do more meaningful work, using data and advanced analytics to continually optimise processes to find energy efficiency and carbon emissions savings or ways to increase production.
Furthermore, when early warning of potential failure occurs, instead of referring to a standard manual, operators will search an AI-powered system loaded with historical data to derive information quickly from past failure records. Much like a digital home assistant, the AI tool will offer advice and insights, such as presenting options for the next course of action. Machine learning tools can also help operators simulate and test troubleshooting workflows, offering indications of potential outcomes. While augmented reality (AR) headsets will facilitate access to remotely located experts who will guide onsite operators through processes, sharing videos and other resources.

Augmenting the role of the operator in this way will appeal to a workforce that expects to have a wealth of knowledge at their fingertips, and that is used to working with intuitive and intelligent digital systems that provide automatic and seamless assistance.

Benefits of the augmented operator
Evolving the DCS and operator role to be more augmented, automated and intuitive has several clear benefits for both employees and operators. For example, as factories start to produce more products, complexity increases; any error from the system or operator can incur both health and safety risks and costly downtime. An intelligent control system equipped with AI analysis and machine learning, however, will identify anomalies earlier and enable operators to respond faster, and in a more informed and intuitive way, for less downtime and a more proactive experience for the workforce.

Simulation using digital twin technology and remote expert access with AR will also help personnel train and maintain skills in a way the ‘digital generation’ will be highly receptive to. In fact, undergraduate training is already supported in this way at the one-of-a-kind carbon capture and storage operational training plant at Imperial College London. The facility is equipped with an ABB Collaborative Operations Centre featuring ABB’s scalable automation solution ABB Ability™ System 800xA®. It enables students to control all aspects of the plant’s operation, including running simulations and remote monitoring, with data feedback from 250 separate instruments.

The ‘augmented operator’ concept purposefully shifts the role away from being concerned only with maintaining regular operations to one where new digital tools can be used to optimise workflows, find energy efficiency savings and production gains. This can foster a sense of meaning and ownership, something that is shown to attract and retain existing and emerging workforces.

In addition, remote working, which was rapidly accelerated during the pandemic, will be expected as standard, along with more flexible working, by emerging generations. While completely autonomous operations are not here yet, burgeoning automation within the DCS, enabled by AI and machine learning, can reduce the need for people to be working at the coalface. In addition, access to remote experts through AR, will also see less people needed offshore or at remote locations, resulting in less travel costs and associated carbon emissions and more time with family and friends.

Working towards the augmented operator
Many of these technological capabilities already exist today and integration within a facility’s operating system will, and already is, happening in an evolutionary fashion. This approach maintains the value of past investments without requiring long plant shut downs. In fact, horizontal integration of safety, electrics, and telecommunications layers into the same process control human interface started 20 years ago, meaning there is already some level of augmentation within control operations. But most are focused on maintaining only high productivity and stable operations.

The next step is to fuse together the DCS, operations technology and real-time control system with the Edge and newer IT technology, such as machine learning and AI. As well as incorporating historical data and the mining of other data sources for pattern recognition and knowledge extraction. This will shift the automation system beyond only real time control to one that allows the operator to augment operations from day-to-day. Security will be assured by maintaining independent layers of protection for each technology segment, keeping safeguards in place.

But beyond the technology integration it is important to consider the process and people side of adoption. Employees will need to be trained to use these new tools and processes adapted to accommodate them. In some cases, new regulations are required. Therefore, it’s not just the technology that will need to be updated.

Preparing for the future workforce
The augmented operator concept is part of ABB’s mission to continuously optimise and improve operations to become more energy efficient and productive, while also attracting the workforce of the future.

Today machine learning and artificial intelligence still has some distance to go before they will enable completely autonomous operations. But they can already do many of the more mundane tasks leaving operators to focus on the higher value activities, creating more overall job fulfillment. It will be a journey, but humans working with technological systems to augment their cognitive capabilities can amplify their potential and provide huge value to both the workforce an industry at large.

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