

# BUSINESS TRANSFORMATION

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SPECIAL ISSUE

## TRANSFORMATION OF HUMAN RESOURCES

Top executives explore the future of organisations and the impact of digital technologies on leaders, teams, skills, roles, and culture.



(Left to right) • Marketa Simkova, KPMG Lower Gulf • Katerina Manou, Regus • Ektaa Sibal, Wellness and Life Coach • Jay Srage, Michigan Ross • Mansoor Sarwar, Sage Middle East • Conal Thompson, HireRight • Vasudevan KS, Navo Management Consultants • Robert Speed, Blackboard • Chris Howard, Gartner • Chris Pope, ServiceNow • Majid Mneymneh, Pearson Online Learning Services • Ali Hyder, Focus Softnet • Rahul Misra, Oracle • Peter Clevertion, HireRight



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## ARRIVAL OF HUMAN TRANSFORMATION

We have seen digital transformation impacting industries, supply chains and leading incumbents. Digital transformation is also impacting the very fabric of organisations, leaders, employees, teams, job roles, and culture. Consumerisation of technology is helping to

move IT out of the IT department and bringing it into the centre of the organisation, increasingly aligning it with business.

Adoption of cloud and mobile application platforms are adding agility to the organisation, never seen before. All these factors are driving the transformation of the human resource function.

In this issue of BT, Business Transformation, more than a dozen human resource, training and technology experts, express their opinions and comments about the impact of digital transformation on the functioning of people inside the organisation.

These experts include, Ali Hyder, Focus Softnet; Chris Howard, Gartner; Chris Pope, ServiceNow; Conal Thompson, HireRight; Ektaa Sibal, Wellness and Life Coach; Jay Srage, Michigan Ross; Katerina Manou, Regus; Majid Mneymneh, Pearson Online; Mansoor Sarwar, Sage Middle East; Marketa Simkova, KPMG Lower Gulf; Peter Cleverton, HireRight; Rahul Misra, Oracle; Robert Speed, Blackboard; Vasudevan KS, Navo Management Consultants.

One of the most significant statements comes from Jay Srage at Michigan Ross. He points out that business transformation is not happening for the first time in this world. Srage points out that the creation and loss of jobs is cyclic and part of the transformation process. He writes: with every disruption, new economic sectors are created allowing for new job roles to be created. 60% of newly created jobs by 2030 will be jobs that do not yet exist.

Artificial intelligence and automation are technologies that promise to impact job roles and teams the most. Any human function that is repetitive and does not require high level, human decision making will invariably be automated. On the other hand, skills such as creativity, innovation, problem solving, mental elasticity, collaborative working, purposeful listening will continue to drive employability, according to Navo Management Consultants' Vasudevan KS.

However, Conal Thompson at HireRight does point out a dark side to artificial intelligence and deep learning. These tools and their findings can become biased, if the datasets are skewed in favour of some characteristics that can influence the results in the future. Human intervention and assessment, therefore remains the safest way forward in some cases.

Another great feature in this issue, is how global vehicle manufacturers are gearing up for delivery of autonomous driving. Alex McMullan at Pure Storage takes us through the innovations that are taking place in terms of data paths, computation, artificial intelligence, and deep learning to make this a reality in the years ahead.

Hope you enjoy the deep dive in this issue.

See you at Gitex 2019 next month at our video booth.

Arun Shankar  
arun@gecmmediagroup.com

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# CONTENTS

SEPTEMBER 2019

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**HUMAN TRANSFORMATION**  
Top executives explain how digital technologies are impacting job roles, role play, culture, place of work.

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## 06 OPINION

Transforming the human mind through meditation at work  
Ektaa Sibal, Certified Wellness and Life Coach

---

## 08 OPINION

Leveraging diversity of employees in digital organisations  
Katerina Manou, Regus

---

## 10 OPINION

Are the credentials of candidates really theirs?  
Peter Cleverton, HireRight

---

## 12 OPINION

Why AI can only enhance not replace human resources



# 27

USE CASES

INDUSTRY COMMENTS

# 14

Cybersecurity safeguarding transformation of industries

Majid Mneymneh, Pearson Online Learning Services

# 17

Schools, students, curriculum are transforming

Robert Speed, Blackboard

# 20

Successful transformation requires changing mindsets

Chris Howard, Gartner

EVENTS

# 22

COVER FEATURE

# 35

Agility of business will drive human efficiencies. Chris Pope, ServiceNow

# 36

Human insight still best tool for selection. Conal Thompson, HireRight

# 37

Not the first time for business transformation. Jay Srage, Michigan Ross Executive Education

MARKET OUTLOOK

# 42

Pure Storage is influencing autonomous vehicle industry

# 48

Preparing data to generate learnings and patterns

# 51

How automation can boost the productivity of HR

# 54

EXECUTIVE CORNER

# 56

LOOKING GLASS

You cannot dictate origin and pace of disruption

# 38

Impact of organisational transformation far reaching. Mansoor Sarwar, Sage Middle East

# 39

Reimagine the organisation balancing AI and humans. Marketa Simkova, KPMG Lower Gulf

# 40

Valuing human skills in a world of transformation. Vasudevan KS, Navo Management Consultants



# TRANSFORMING THE HUMAN MIND THROUGH MEDITATION AT WORK

Wellness techniques like meditation are being accepted by organisations to help executives cope with stress of transformation, explains international meditation expert, Ektaa Sibal.



*Ektaa Sibal is an international meditation expert, speaker and a gifted energy healer, with inborn intuitive abilities. She is a certified Wellness and Life Coach, Master Practitioner and Trainer, in Neuro Linguistic Programming.*

Work related stress is a major cause of concern in many organisations due to the ever-increasing pressures on people to perform; increasing demands on the mind and emotions, which is overwhelming for all. In fact, World Health Organisation has termed stress as a worldwide epidemic. Having said that, stress also has an antidote which many researchers and medical practitioners vouch for

and that is meditation.

Meditation is a helpful tool in strengthening people at the workplace emotionally and mentally. Meditation at the workplace is also gaining interest amongst many corporate giants. According to research findings, organisations that have instituted a meditation programme in their work environment, have seen a significant fall in employee stress resulting in substantial increase in productivity and decrease in employee absenteeism.

Some of the prominent Fortune 500 companies that have launched meditation programmes are Procter & Gamble, Google, Nike, General Mills, Comcast.

Let's take a look at some of the benefits of practicing meditation at the workplace and see how it can create a positive impact on all the people at the workplace.

## Reduced stress

When stress is left untreated, it can lead to many issues such as cardiovascular diseases, hypertension, anxiety or even depression. Meditation when done regularly creates inner calmness and reduces irritability helping in lowering stress levels. It also helps in increasing the sense of control in one's life.

## Improved concentration

Practicing meditation consistently increases our ability to sustain attention and decreases distractions—external or internal. Researchers from Harvard medical school found that while meditation led to changes in the brain structure. It also brought

some positive changes in the brain regions of learning and working memory capacity. This is very significant as working memory is responsible for reasoning and crucial in guiding our behavior at workplace.

## Better decision making

Mental clarity is very crucial for everyone but it is even more essential for those who are entrusted with making difficult strategic decisions that can impact the organisations. Practicing meditation teaches the brain to attain clarity and look at situations with less cognitive rigidity which in turn helps in making more rational decisions.

## Vibrant environment

Social interaction and work relationships are important aspects in creating a work environment which is positive, healthy and lively. Meditation helps in making people more emotionally intelligent, which makes relationships more positive, natural and easier. In fact, meditation tends to make people more acceptable towards each other and creates friendly and cordial work environment.

As a closing thought, it is imperative for organisations to implement a meditation programme at the workplace to facilitate people to experience the benefits of meditation and how it helps people individually but when done collectively it adds up to achieving collective goals. ■



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# LEVERAGING DIVERSITY OF EMPLOYEES IN DIGITAL ORGANISATIONS

As technologies bring together teams in different countries, Katerina Manou from Regus, points to hidden strengths that can be leveraged in cultures.



KATERINA MANOU,  
Regional Vice President,  
Regus.

The UAE is home to over 200 nationalities, with people from all over the world living and working across the Emirates. This means that most companies in the UAE have a diverse mix of employees from different nationalities and cultures, which can enrich the working environment.

If you manage a team made of up people from many cultures, you will know the competitive advantage that comes from having an array of languages, characteristics,

knowledge, ideas and working styles in your arsenal. Here are some tips for formidable international teamwork.

## MULTICULTURALISM

Emphasizing that multiculturalism is a key part of your team's identity when interviewing candidates, and including it in your mission statement or branding, sets the tone for tolerance and attracts those who are willing to embrace the many benefits of a working with a diverse team of people.

While it is important to judge employees as individuals rather than products of their culture, it is still worth considering the various approaches to business etiquette and social interactions may differ. How these will play out in the overall group dynamic? Where possible, it is worth holding a team-building session where employees can each describe their preferred working style.

## TIME ZONES

If team members are based across various countries, continents and time zones, it can be challenging, as there is often not as much room for maneuver when it comes to scheduling group calls. The plus side of this is that it encourages you to create more structure and have a clear agenda for each meeting – which can sometimes get lost when you have the option to spontaneously

huddle in the same physical space.

## TECH TANGLES

The sophistication of video conferencing software makes it easier than ever to run a business with staff in different locations, and the consistent rise of global flexible working culture will only continue to create demand for it to keep improving.

At the same time, in the same way you would set up a physical meeting room, time is needed to avoid the frustrations of chaotic virtual meetings: dodgy Wi-Fi, people not knowing the conference code, people turning up late while everyone else waits

## COMMON LANGUAGE

During a meeting, if two or more people start speaking to each other in a language another team member does not understand, it is extremely frustrating, and can lead to feelings of exclusion. Even if what was said is translated afterwards, there's a sense of being the last to know information or missing a chance to bond over a joke.

Make it a rule that employees are free to use whichever language they choose during personal time and lunch breaks, for example, but during meetings, everyone must stick to an agreed common language. ■





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# **Synergising the Mind & Technology Economy**

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# ARE THE CREDENTIALS OF CANDIDATES REALLY THEIRS?

Hiring a new employee carries a degree of risk, that increases with the seniority of the employee, explains Peter Cleverton at HireRight.



PETER CLEVERTON,  
General Manager EMEA,  
HireRight.

The Middle East is in a period of rapid growth, with the financial services sector, among others, establishing a foothold in the region. This growth has seen a massive influx of labour from around the globe, drawn by the opportunity to work in one of the world's most exciting economies. The Middle East offers real challenges to companies looking to screen candidates given

the mix of privacy legislation and cultural norms.

Whilst the demand for pre-employment background screening is growing, its adoption throughout Europe, Middle East and Africa is far from universal. A background screening report found that 89% of human resource and risk experts have seen candidates misrepresent information on their job applications, with over a quarter 28% uncovering issues during screening of senior level staff.

When you bring a new employee into your business to fill a key role, you are vulnerable to risk. With discrepancies continuing to be identified across all candidate levels – from entry level to boardroom – it is often not enough to rely solely on CVs and references. This is particularly important when a company is recruiting for a position that may significantly affect the direction and future of the company.

A background check is often the final step taken by employers to help ensure a sound hiring decision and mitigate business risk, confirming a candidate has the necessary skills and qualifications, and are suitable for that particular role.

The key to mitigating risk is information and each type of check will reveal different information to help businesses make an informed decision about who they are hiring.

Employment history is one of the most common areas that employers seek to validate. Requirements vary from confirming the candidate's last position to verifying employment

history within a defined period of time. Employing an underqualified individual, particularly at a senior level, could pose a number of threats to your company including financial and reputational risks.

Confirming education and academic qualifications is important because they can be easy to embellish or enhance as academic records often go unchecked. Education checks are performed by contacting institutions or other authorised sources directly to verify a candidate's education history has been listed correctly.

A criminal record check allows the potential employer to assess whether an individual's record could present a risk to the organisation. Employers have certain duties towards their employees' welfare, as well as for the safety of customers, vendors and visitors. Criminal checks vary from country to country.

It is also important to check a candidate's identity documents to verify they are in fact who they say they are. This is usually done by checking machine-readable passport details or ID documents, which vary from country to country against the details provided by a candidate.

Additional checks include credit history, professional license, qualification verifications, directorship checks and executive intelligence. ■





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# WHY AI CAN ONLY ENHANCE NOT REPLACE HUMAN RESOURCES

Only humans can understand humans, while tools like artificial intelligence and bots can speed up gathering insights, explains Rahul Misra, Oracle.



RAHUL MISRA,  
Vice President  
Business Applications,  
Lower Gulf, Oracle.

## KEY TAKEAWAYS

- Artificial intelligence will probably become a best friend but will never be human.
- Artificial intelligence can only see the data, not the people behind it.
- Human resource staff or line managers can ask a chatbot to gain insight into employee performance history.
- It is important to treat artificial intelligence as an addition rather than a replacement for human resources staff.
- AXA's human resource teams are tasked with managing 157,000 people across 56 countries.

Why do you work in human resources? Most probably because you are interested in people and their welfare. You are a people person. Artificial intelligence will probably become your new best friend in the next couple of years, but artificial intelligence will never be human.

Its limitations need to be understood and taken into account. Human resources need to get itself into a prime position to keep track of what is top of an employees' wish list for technology.

Plus, it is vital that human resource professionals use the latest technology like everybody else, so they can provide insights that will help business leaders understand the interdependencies of business and people.

One company doing this is insurance firm AXA. As a large global company with many decentralised businesses, AXA's human resource teams are tasked with managing 157,000 people across 56 countries.

With access to smart technology, human resources staff or line managers can simply ask a chatbot to source specific data points to gain insight into employees' performance history.

A pregnant worker who wants more details about the company maternity leave policy could just grab their mobile and chat to a bot – the artificial intelligence might even suggest additional actions or activities based on the experiences of others.

However, it is important to treat artificial intelligence as an addition rather than a replacement for human resources staff. While artificial intelligence can be great as part of the recruitment process, attracting talent

from a broader range of backgrounds than traditional recruiting processes for example, interviews are still vital to getting a feel for the right candidate.

More critically, it is imperative to keep bias out of human resources systems. There have been several cases where organisations have relied on artificial intelligence, and been called out as racist.

According to a study by Massachusetts Institute of Technology, 35% of images for darker-skinned women faced errors on facial recognition software, compared to only 1% for lighter-skinned males.

Google, meanwhile, has decided to omit gender-based pronouns from its Smart Compose Gmail technology, as it cannot find a way to guarantee the software correctly predicts someone's sex or gender identity, and avoid causing offence.

Take the case of the pregnant worker asking the chatbot questions about their upcoming leave – the artificial intelligence system might be programmed to automatically refer to the father of the baby, in an era where same-sex couples and single parents could just as well be the case.

The key for human resources staff is to be able to trust the data in front of you, so you can ensure the advice and information being passed to staff and used to form business decisions is accurate. Artificial intelligence can only see the data, not the people behind it; human interpretation is necessary to avoid built-in bias and offence. ■

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# CYBERSECURITY SAFEGUARDING TRANSFORMATION OF INDUSTRIES

Demand for cyber security professionals is increasing driven by shortage and digital transformation explains Majid Mneymneh at Pearson Online.



MAJID MNEYMNEH,  
Regional Director Middle East,  
Pearson Online Learning Services.

When we look back over the past 100 years, we can see that our collective computing capability has seen exponential growth. For example, the way we can store data has advanced and today we are seeing a boom in companies who can store vast amounts of data for us in the cloud.

Similarly, we are now seeing massive leaps in bandwidth, thanks to the advent of super-fast 5G networks which enable highly connected technologies blending physical and digital realms from augmented and virtual reality, artificial intelligence, autonomous vehicles, 3D printing, wearable technology and more.

All this progress has inspired us to develop solutions which make life easy, and this has led to the boom of machine-to-machine communications, and the growth of the Internet of Things. According to Statista, the total installed base of IoT connected devices is projected to amount to 75.44 billion worldwide by 2025, a fivefold increase in ten years.

Closer to home, the UAE's digital ecosystem offers an expanded attack surface for cybercrime. The UAE has the second-highest smartphone adoption rate globally at 85% after Singapore, and the nation is one of

the world's most interconnected countries.

In this backdrop, cyber security has also seen exponential growth on account of its increasing necessity. Hacking continues to be the greatest threat in cybercrime, followed by malware, social account breaches and more.

In the future, cybersecurity professionals will be much sought-after for their skillsets and the crucial role they play in ensuring our lives run smoothly. Having said this, computer science programs struggle to offer adequate cybersecurity courses for the next generation of technologists. Of the top 50 computer science programs in the US, only 42% offer three or more information security-specific courses for undergraduates.

The UAE's National Cybersecurity strategy aims to tap into an opportunity of AED 1.8 billion in the UAE cybersecurity market and AED 18 billion MENA cybersecurity market. The nation plans to develop the capabilities of more than 40,000 cybersecurity professionals as well as encourage professionals and students to pursue a career in cybersecurity.

They want them to pick up the necessary cybersecurity capabilities and foster a vibrant ecosystem of

CYBER SECURITY HAS ALSO SEEN EXPONENTIAL GROWTH ON ACCOUNT OF ITS INCREASING NECESSITY.

cybersecurity training providers. In this backdrop, a career in this field will be a lucrative one. Not only that, with an ever-expanding scope, cybersecurity presents the ultimate growth potential—both for a career path as well as for learning opportunities.

It links to all the other IT skill sets and offers a massive opportunity to stay engaged and challenged. Cybersecurity professionals are also extremely well compensated for their skills and talents. With salaries rising with demand, as the shortage increases so will earning potential.

With the number of devices today, it is clear that cybersecurity matters. This field has an impact which goes beyond digital to the physical one. An example is the 2017 Triton malware strike against Saudi oil giant Petro Rabigh, which came close to triggering high-pressure explosions of toxic hydrogen sulfide gases along the Red Sea coast.

Thanks to the quick intervention of cybersecurity professionals, a disaster was averted. Had the attack succeeded, it could have taken a considerable toll on business and human life. Therefore, for someone wanting to work on IT issues that have real-world impact, cybersecurity might be the right discipline, as well as proof of how important it is.

Cybersecurity skills are not limited to technology-related fields. In today's digital landscape, almost all

industries from banking to insurance to automobiles to healthcare all require information security services. These are highly transferrable skills that companies are in search of and there will be a variety of opportunities available in several industries around the world.

As the digital world continues to evolve and more companies become dependent on technology, professionals with the right skillsets and innovative minds will always be in universal demand as well have plenty of choice.

One does not have to be a technology expert to work in cyber security. In addition to technology-focused roles, alternative career paths include threat intelligence, legal and regulatory compliance, business analysis and recruitment. The portability of cybersecurity skills enables one to pick and choose from various career paths, which is a big advantage. ■

## KEY TAKEAWAYS

- Hacking continues to be the greatest threat in cybercrime, followed by malware, social account breaches.
- As the digital world continues to evolve, professionals with the right skillsets will always be in universal demand.
- Cybersecurity skills are not limited to technology-related fields.





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 SEAGATE



# SCHOOLS, STUDENTS, CURRICULUM ARE TRANSFORMING

Digital technology is changing teaching and schools and curriculum architects need to transform, explains Robert Speed at Blackboard.



ROBERT SPEED,  
Vice President RMEA,  
Blackboard.

The Fourth Industrial Revolution—sometimes referred to as Industry 4.0—is a new chapter in human development and is marked by breakthroughs in areas like artificial intelligence, robotics, virtual reality, Internet of Things, and quantum computing that have no historical precedent.

Moreover, if we think about what the world was like only ten years ago, we could appreciate how these advances are happening at an exponential rather than linear

pace, disrupting entire disciplines, industries and economies.

It is clear that this new world requires new sets of skills both technical and personal, such as cognitive flexibility, critical thinking, complex problem solving, or emotional intelligence. Although information and techniques needed to develop these skills are not typically found in a course textbook, educational institutions are nevertheless ideally positioned to help train the ideal workforce for this new world.

Simultaneously, institutions can also leverage these new technologies to achieve better outcomes for the student of tomorrow. But how can this happen?

## NEW LEARNINGS

It is important to remember that students learn in different ways and at very different paces. New teaching and learning models allow for personalised, competency-based learning and have the power to dramatically boost student success through scalable approaches and a continuous, integrated cycle of assessment.

For example, blended learning — an approach to teaching and learning that combines online materials and opportunities for interaction with

traditional classroom methods — is creating a new hybrid teaching system that is particularly suited to the new generation of learners.

Most professors in blended classrooms use a course management system application to connect with students online. Through these platforms, students can access videos of lectures, track assignments and progress, interact with professors and peers, and review other supporting materials, such as presentations or reference articles.

The flipped classroom model — in which students watch or listen to pre-recorded lectures online, on their own time rather than during class — frees instructors to interact with students in the classroom.

## STUDENT INSIGHTS

Using advanced analytics can significantly transform the way educators work by enabling new ways to engage students, increase enrolment, improve retention and completion rates, and even boost faculty productivity and research.

Learning analytics turns raw data into valuable information, offering insights to improve teaching and learning. It can identify at-risk students, optimise assessments, promote reflection and self-



ACCORDING TO A REPORT, THE NUMBER OF STUDENTS IN THE GCC IS PROJECTED TO REACH 15 MILLION BY 2020, MAKING IT ONE OF THE FASTEST GROWING.

regulated learning, establish feedback loops and even boost faculty development.

Over time, institutions will increasingly use more data as a base for their decisions and strategies. Liberated from the task of simply describing what the data are, analytics allow institutions to focus on more important questions about what they mean, and what we should do about them.

### TRANSFORMING SCHOOLS

Considering all the elements, it is clear that to benefit from the opportunity presented by advances in technology we need a complementary revolution in the education sector, not just to meet the needs of industry, but also to deliver the best possible learning experience.

First, institutions need to change their perspective. They need to realise that the way they have been providing education, typically through in-person lessons, is not suited to today's digital natives who expect a personalised, anywhere-anytime, seamless learning experience.

Second, universities are the ones expected to change, not the students. Forcing students to adapt to pedagogical approaches that do not answer today's requirements only because that is how teachers were trained to teach is a recipe for failure.

Third, institutions need to implement technology to look at

what is happening outside their walls. Many countries within the Middle East in particular have ambitious goals for transforming their schools and education sectors — and they recognise education technology as an essential conduit to make it happen.

### REGIONAL MARKET

According to a recent report the number of students in the GCC is projected to reach 15 million by 2020, making it one of the fastest growing student populations in the world.

To prepare the workforce needed for the digital economy, the region's educators are adapting their curricula to include tech-powered tools that will positively impact areas such as curriculum applications, universal access to classrooms, data applications and behavioural analytics applications.

For instance, in the United Arab Emirates, in line with the nation's Vision 2021, nearly one-fifth of its federal budget has now been allocated to the education sector. The UAE Innovation Strategy refines these efforts, promoting innovation in the classroom and beyond by introducing creative teaching methods.

Simply put, today's education must not be confined to the classroom or traditional techniques. Technology can deepen the education experience for learners and for teachers, particularly through personalised learning and data-driven insights.

Educational institutions that fail to adapt their teaching methods and infrastructure to these new developments will fall behind, crippling student success in the process. Developing students' critical thinking and social engagement with education technology is an essential element to the success of modern pedagogy. ■

### KEY TAKEAWAYS

- To prepare the workforce needed for the digital economy, the region's educators are adapting their curricula.
- Tools include curriculum applications, universal access to classrooms, data applications, behavioural analytics.
- New models allow for personalized learning and can boost student success through integrated cycle of assessment.
- The flipped classroom model, frees instructors to interact with students in the classroom.

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# SUCCESSFUL TRANSFORMATION REQUIRES CHANGING MINDSETS

Successful transformation requires ability to change mindsets amplified by technology, while generating progress, explains Chris Howard at Gartner.



CHRIS HOWARD,  
Distinguished VP Analyst,  
Gartner.

The rapid pace of digital business evolution means that organisations must be continuously adapting their business and operating models. For most organisations, some degree of change is required to accomplish their business priorities.

If you pursue the right strategy and quickly adapt to what is next, you will be ready to deal with sustained and rapid change. This builds momentum through and beyond digital transformation using the approach called ContinuousNext.

ContinuousNext is a strategy to achieve success in a world that is

constantly changing. Changing mindsets lead to new practices, which are amplified by technology, leading to new capabilities and yielding new results.

Start with a simple formula:

(Mindsets + Practices) X

Technology = Capabilities

Given constrained resources and resistance to culture change, leaders should embrace five significant imperatives to enact a ContinuousNext strategy in their organisations.

## PRIVACY

Privacy is one of the top barriers to being or becoming a dynamic organisation. How consumers feel about privacy, and what actions they take surrounding privacy, have shifted. Privacy is now a board-level issue, and CIOs need to maintain data protections to ensure a dynamism that supports ContinuousNext evolution.

Today's consumers are updating privacy settings or even deleting social media accounts altogether. As consumers become less willing to sacrifice security and safety for convenience, organisations must carefully balance deriving value from consumer data with protecting it.

A smart way to change culture without big pronouncements and 100-page slide decks, is to start culture hacking. Organisations that hack their culture can turn a barrier into an accelerator. CIOs might want to try this. Gartner predicts that by

2021, CIOs will be as responsible for culture change as are Chief Human Resource Officers.

## AUGMENTED INTELLIGENCE

Remarkable advances in artificial intelligence have taken it to the point of augmented intelligence. In recent years, artificial intelligence has met human capability in reading comprehension, Chinese and English language translation, and cancer diagnostics.

As a broad collection of technologies, artificial intelligence works not as programmed technologies, but instead as learning systems that rely more on data than programming. Because they are networked, they will learn from their peer artificial intelligence systems — and advance exponentially.

The most impactful artificial intelligence implementations are those in which people interact with the technology in a collaborative system.

However, although organisations that have yet to launch an artificial intelligence initiative fear that it will displace human jobs, those that have adopted artificial intelligence technologies find this is not the case. The reality is organisations are beginning to use artificial intelligence not to replace humans, but to augment the work they are able to do.

People work side by side with artificial intelligence, which extends their capabilities and makes jobs

## CHANGING MINDSETS LEAD TO NEW PRACTICES, AMPLIFIED BY TECHNOLOGY, LEADING TO NEW CAPABILITIES AND NEW RESULTS.

### KEY TAKEAWAYS

- A smart way to change culture without big pronouncements is to start culture hacking.
- Top performers are twice as likely to be doing product-centric delivery.
- Digital product management is not just a different way of doing IT, it is a different way of doing business.
- Organisations that hack their culture can turn a barrier into an accelerator.
- The most impactful artificial intelligence implementations are those in which people interact with the technology in a collaborative system
- Organisations are beginning to use artificial intelligence not to replace humans, but to augment the work they are able to do.
- People work side by side with artificial intelligence, which extends their capabilities and makes jobs more impactful.
- Culture is identified by 46% of CIOs as the largest barrier to realising the promise of digital business.
- The first rule of culture change is to know what you want to change into.

more impactful. In other words, the most impactful artificial intelligence implementations are those in which people interact with the technology in a collaborative system versus those in which people merely consult the technology as a separate system.

### CONTINUOUS MODERNISATION

Organisations must move away from only supporting and working around legacy infrastructure. The focus is now on modernising the core to shape, change and drive digital transformation. This is what Gartner calls continuous modernisation.

To make the leap to continuous modernisation, organisations must focus on three things:

- Shaping a different type of relationship with your business by aligning with partners.
- Shifting mindset toward legacy infrastructure by recognising the dynamism that is central to a continuous modernisation effort.
- Sharing insights and new perspectives.

A renovated core technology platform that is continuously modernised will spring you forward into the next phase of your ContinuousNext journey.

### DIGITAL PRODUCT MANAGEMENT

Some of the most powerful companies have fused digital technology into products, creating a new management practice across all industries. Digital products are now in every industry, which has given

rise to a new push for digital product managers.

Digital product management is a core imperative of ContinuousNext, and accelerating adoption means that if you do not start soon, you may never catch up. By shifting to a digital product mindset, organisations can put customers at the center of their development.

### CULTURE

Organisations must have a dynamic culture to enable ContinuousNext. However, culture is identified by 46% of CIOs as the largest barrier to realising the promise of digital business. The first rule of culture change is to know what you want to change into.

In terms of getting there, you will need to do a lot of big change. But what leaders systematically leave on the table are the smaller actions that could have just as big an impact on change.

A smart way to change culture without big pronouncements and 100-page slide decks is to start culture hacking. By culture hacking, we do not mean finding a vulnerable point to break in to a system. It is about finding vulnerable points in your culture and turning them in to real change that sticks.

Culture hacking takes change off the horizon and inserts it into people's day-to-day, in a visceral, memorable way. A great culture hack incites an immediate emotional response — shock, love, shame, pride — has immediate results, and is visible to lots of people at once. ■





# VERITAS APTARE BREAKFAST BRIEFING SERIES KICKS OFF IN DUBAI

The first executive breakfast briefing kicked off in Dubai with the presence of Aptare's Rick Clark and a live demonstration of the dashboard.

**O**n 02 September, GEC Media Group, publishers of Business Transformation, Enterprise Channels, The Titans, Cyber Sentinel, successfully kicked off its executive breakfast briefings on the theme of how to manage IT environments in a multi-vendor, multi-cloud infrastructure. The executive breakfast briefing is being conducted in partnership with Veritas, and

showcases its newly acquired Aptare IT Analytics solution.

The GEC Media Group, Veritas Aptare road show kicked off in Dubai, with an onsite presentation by Rick Clark, Vice President, Aptare Worldwide Sales. This executive breakfast series continues next into Riyadh, Abu Dhabi in September, followed by Doha, Kuwait and Oman.

The Aptare IT Analytics solution

integrates IT performance metrics from any vendor driven environment covering storage, backup and recovery. Presenting at the breakfast briefing in Dubai, Aptare's Clark, pointed out that Aptare works across any cloud, any storage and any backup environment. Also present at the Dubai executive breakfast briefing, along with Clark was Kareem Halasa, Practice Lead EMEA



The Dubai breakfast briefing was attended by top IT decision makers from Al Hilal Bank, Al Masrah Capital, Al Masrah Bank, Arabia Holding, Arabia Holding, Burj Al Arab Hotel, Deloitte, du, Dubai Investment, Emirates NBD, Fleming International, Gargash Hospital, Mashreq Bank, Ministry of Economy, amongst others.



The GEC Media Group, Veritas Aptare, executive breakfast briefing, kicked off in Dubai, with an onsite presentation by Rick Clark, Vice President, Aptare Worldwide Sales. Clark, pointed out that Aptare IT Analytics works across any cloud, any storage and any backup environment.





*Ice breaking session breaks the ice at the Veritas Aptare, executive breakfast briefing in Dubai. Getting to know the attendees, their key expectations, and their pain points. IT decision makers present at the Dubai breakfast briefing, pointed out that their pain points are around visibility into IT environment, cost control, data compliance, and IT transformation.*

### Emerging Region, Veritas.

The Dubai breakfast briefing was attended by top IT decision makers from Al Hilal Bank, Al Masah Capital, Al Masraf Bank, Arabia Holding, Arabia Holding, Burj Al Arab Hotel, Deloitte, du, Dubai Investment, Emirates NBD, Fleming International, Gargash Hospital, Mashreq Bank, Ministry of Economy, amongst others.

The IT decision makers present at the Dubai breakfast briefing, pointed out that their pain points are around visibility into their IT environment, cost control, data compliance, and IT transformation.

Most of the high-level end users present during the briefing pointed out that they manage multiple businesses across a group, which is usually diversified and complex. While vendor sprawl was not a

significant challenge, using an agentless solution from Aptare, working across an open extensible framework, would help them reduce their pain points.

Clark explained that Aptare IT Analytics can meet their expectations in managing and delivering compliance, security, performance metrics, cost metrics, storage, IT management, chargeback and automation. Veritas' Halasa demonstrated the Aptare IT Analytics solution running live from a cloud environment using a browser.

Particularly impressive was the ability to build custom reports and dashboards using a drag and drop approach. Clark stressed that Aptare also has a vast library of report templates that cover almost any type of end user requirement, that has been built from a long baseline of

first hand engagement with global end users.

CIOs, heads of datacentres, heads of IT infrastructure are being challenged by the complexities of managing data storage, backup, recovery, disaster recovery, availability, continuity, across multi-vendor and mixed environments. Managing these across in-cloud, on-premises, hybrid and virtualised environments, adds additional complexity.

Using Veritas Aptare IT Analytics, datacentre administrators can detect opportunities in unused data storage, can better manage costs of data storage, can initiate internal charge-back for data services, and can engage in smarter vendor negotiations.

With these solutions, IT decision makers managing data and storage



Also present at the Dubai executive breakfast briefing, along with Clark was Kareem Halasa, Practice Lead EMEA Emerging Region, Veritas. The GEC Media Group, Veritas Aptare, executive breakfast briefings, continues next into Riyadh, Abu Dhabi in September, followed by Doha, Kuwait and Oman in October and November.

## CIOS ARE BEING CHALLENGED BY THE COMPLEXITIES OF MANAGING DATA STORAGE.

will be in a better position to drive:

- Cost optimisation
- Cost reclamation
- Digital transformation

IT managers can gain clarity across their entire IT infrastructure through a broad-view management console that provides insights on cloud infrastructure utilisation, storage optimisation, chargeback, backup, service level agreements, status and more. They can optimise storage costs, mitigate risk and streamline backup compliance. They can leverage an event correlation engine that includes out-of-the-box correlation logic for some of the most common storage and backup management challenges.

So, what is Aptare IT Analytics?  
It is a unified analytics dashboard

for heterogeneous, hybrid and multi-cloud IT environments. Veritas Aptare IT Analytics stitches together data and storage environment that regional and global end users are working in.

This includes Amazon Web Services, Brocade, Cisco, Cohesity, Commvault, Dell EMC, Hitachi Vantara, HP-MicroFocus, HPE, Huawei, IBM, INFINIDAT, Linux, Microsoft, Microsoft Azure, NetApp, OpenStack, Oracle, Pure Storage, Rubrik, Veeam, Veritas, VMware, Windows. Whether On-premises, private, public, multi-cloud, IT managers can take control over data wherever it resides, with actionable insights through a single-pane-of-glass using high-definition IT analytics.

Aptare IT Analytics is a vendor-independent IT analytics, platform. Its single-pane-of-glass view provides deep analytics and, interconnected insights across the critical components of your IT world, whether on-premises or in the cloud. Aptare IT Analytics also provides a software development kit for end users to create data connectors for additional storage and backup system environments. ■

## KEY TAKEAWAYS

- With Veritas Aptare IT Analytics, datacentre administrators can initiate internal charge-back for data services.
- Aptare IT Analytics is a vendor-independent IT analytics, platform.



**By 2021, 50% of large enterprises will use an integrated risk management (IRM) solution set to provide better decision making capabilities.**

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28 – 29 October 2019 | Dubai, UAE  
[gartner.com/me/security](https://gartner.com/me/security)

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# Why Oracle's Autonomous Database is required to manage data during transformation

In our digital world of today, human expressions of speech and thought are being replaced by the continuous creation of data. As an example, expressive data is being created every minute on Facebook and Twitter. 500,000+ comments are posted on Facebook, 400,000+ Tweets are sent out on Twitter, 45,000+ images are posted on Instagram, 16M text messages and 156M emails are sent out across the world, every minute.

While every urban citizen and global business knows about this, their ability to manage and use these expressions of data, for a productive purpose has become increasingly elusive.

Huge repositories of data are a double-edged sword. Since they have scale and real time context, they are statistically a close subset of the real universe, and hence exciting. On the other hand, because they are so vast, distributed, structured, unstructured, managing them within a framework, using traditional database tools is virtually impossible.

This is one of the reasons why Oracle created the Oracle Autonomous Database, that in some ways manages itself and reduces the burden on the legions of database administrators who would otherwise be required to manage and keep it functional.

Oracle has leveraged on its forty plus years of managing data and has built an intelligent database that can self-manage itself. Oracle Autonomous Database uses machine learning to provide self-driving, self-repairing, and self-securing capabilities that automate typical management and security processes in database systems like patching, tuning and upgrading.



ABDUL RAHMAN AL THEHAIBAN,  
Senior Vice President Technology, MEA and  
CEE, Oracle

Oracle Autonomous Database is a cloud-based application, which performs using Oracle Cloud Infrastructure, and provides 99.995% reliability and availability, amounting to a downtime of less than 30 minutes per year. Oracle Autonomous Database has also been benchmarked to perform at a lower cost than other alternatives.

Says, Abdul Rahman Al Thehaiban, Senior Vice President Technology, MEA and CEE, Oracle, "Nobody knows data better than Oracle. Oracle has always been known as the master of data management for the last 40 years. Throughout this journey we have come across business challenges and we believe we were able to demonstrate strength within the positioning of our database and our business application."

Over the last decade, with the adoption of cloud as a platform for business, the challenge for Oracle was not just to modernise the core engine of its database, but also to migrate the whole platform to a cloud infrastructure.

On the database side, because of the sheer volume of data and the complexities of the aggregated data inside organisations, Oracle soon realised that conventional database technologies would not be able to provide the answer. A typical challenge in the digital economy is the source of information and the source of data are different.

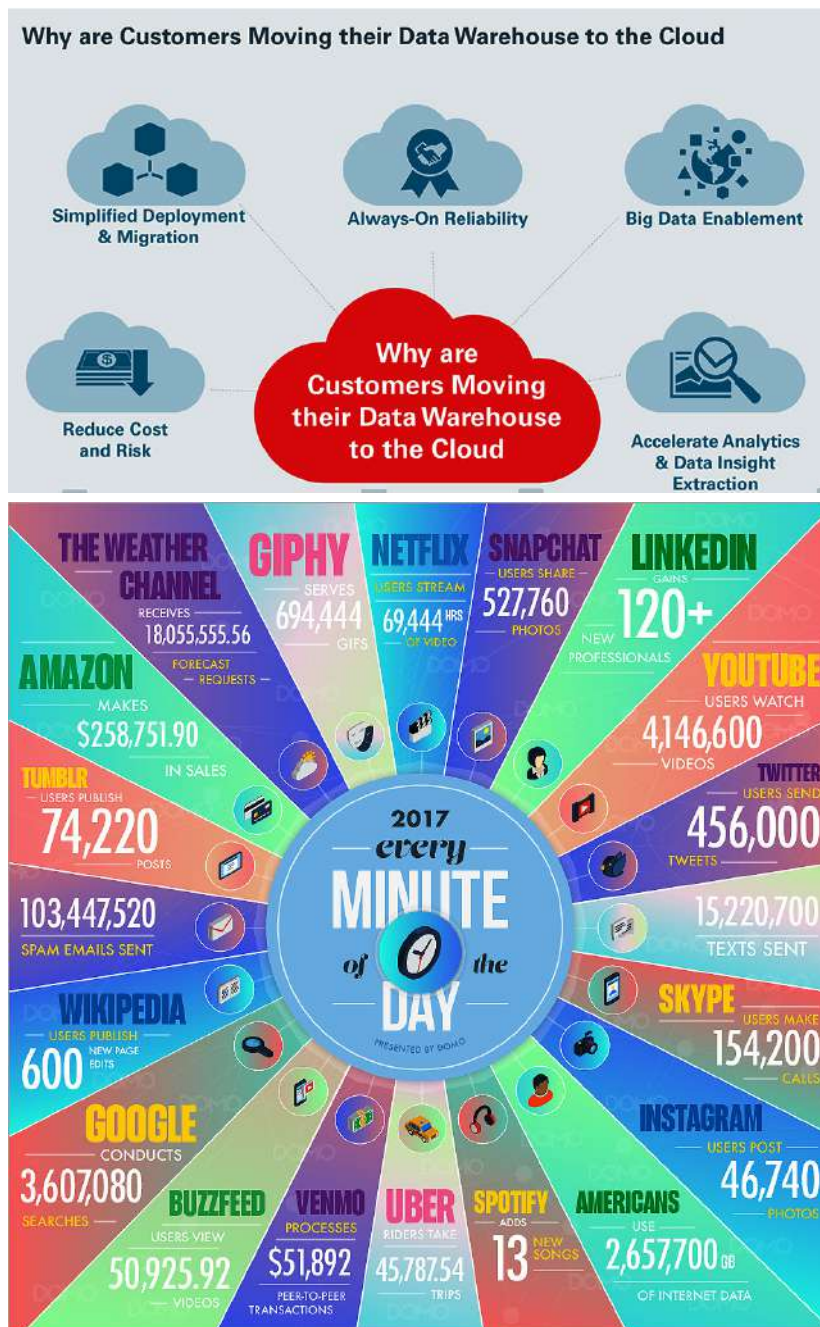
"If you structure the vast volumes of data generated by digital economies using traditional ways of managing data, you will not be able to get the best out of it," says Al Thehaiban.

Using conventional database structures, you would only get answers if you queried the database

## KEY TAKEAWAYS

- This is not about reduction of cost or boosting the growth of business
- Calculating the return on investment would be driven on capitalising the innovation they have.
- For retail, manufacturing, healthcare, Autonomous Database is a critical element of continuity and direction.
- Autonomous is the launch of better management of data itself.
- What if the database gave you answers to questions you could never imagine asking.





within its known limits. But what if the database gave you answers to questions that you could never imagine asking it.

"If you broaden that vision, the things will be different. You will be getting answers for questions you have not even asked for," indicates Al Thehaiban. And that is the litmus test for Oracle's Autonomous Database.

Al Thehaiban points out that when the cloud era came in, Oracle took a hard look at how

its customers could benefit from its strengths in this unique area of databases, and how it could provide a full stack of offerings.

"We initiated based on data management. We thought of Autonomous as the launch of better management of the data itself," says Al Thehaiban.

Oracle has now combined, a cloud platform, machine learning, and artificial intelligence, to create a modern database that delivers on the challenges faced by digital

organisations. For end users, the biggest benefit is the reduced complexity and reduced cost around management of the database.

Oracle is also leveraging its data warehousing strength in Autonomous Database, to manage distributed databases that are so typically generated in a multi-cloud environment. In its Q4 2019 earnings report, almost 40% of the new autonomous customers are using data warehousing. Points out Al Thehaiban, "If you turn the clock back ten years, customers were talking about business intelligence and data warehousing because of the data they have."

So how would customers work out the return on investment for Oracle's Autonomous Database? While there are significant savings in terms of database administrator costs, operational costs, and other benefits stemming from agility and scalability, Al Thehaiban believes the return on investment should be calculated on another metric.

"This is not about reduction of cost or boosting the growth of business. I think the measurement criteria is completely different than in the past. The mechanism of calculating the return on investment would be driven on capitalising on the innovation they have," says Al Thehaiban.

Al Thehaiban feels that return on investment should be calculated based on the innovation created from the implementation of Autonomous Database and its data management.

"We have been in the market for a long time and the whole era has completely changed. We have transformed completely from a different era to another era, while addressing all the requirements of business and business applications. Based on all these, we came up with a better understanding of the customer and customer requirements. We understand exactly the benefit of Autonomous Database and how that could help them with being innovative and creative," summarizes Al Thehaiban. ■

# Aveva driving regional IIoT transformation with Unified Operations Centre

**A**VEVA, a global vendor in engineering and industrial software, launched Unified Operations Centre, its command-and-control solution for infrastructure operators such as smart cities and facilities management, and for industries like Oil and Gas and Mining.

Working side-by-side with leading companies in these verticals, AVEVA has turned best practices into templated solutions that are repeatable, scalable and adaptable, enabling fast implementation and return on investment.

The Unified Operations Centre is a central hub that transforms the control room into a collaborative workspace. Functional silos are broken down by contextualising operational and business data to enable teams to make better decisions based on accurate, real-time information. AVEVA is the first to provide a single solution that integrates IT and OT Operational Technology applications in a central hub, enhanced by industry-specific customisations.

AVEVA's Unified Operations Centre, built on AVEVA System Platform, offers faster time-to-value through industry-proven solution templates, reports, dashboards and operational KPIs that unify available data from operations, process, engineering, maintenance and finance, enabling teams to improve their situational awareness of real-time operations and make better decisions.

Based on a systems of systems approach, Unified Operations Centre allows plug-in and integrated apps, analytics, CCTV videos, GIS maps, ERP systems, Engineering P and ID diagrams and more. With



ABDUL NASSER AL MUGHAIRBI,  
Senior Vice President, Digital at the Abu  
Dhabi National Oil Company.

out-of-the-box industry solution templates, reports, dashboards, and operational KPIs unifying your functional teams, departments and sites, seamlessly, under one platform, Unified Operations Centre enables faster time to value.

AVEVA Unified Operations Centre empowers the whole team with a centralised view to help make informed decisions, fast. Bringing end-to-end operational visibility across facilities helps you improve safety, operational efficiency, and ultimately the profit margins of your business. Oil and gas 4.0 is putting the Industrial Revolution 4.0 within an oil and gas context.

Organisations such as the Abu Dhabi National Oil Company (ADNOC), Assmang Proprietary Ltd and the city of Atal Nagar in India have pioneered early versions of this tailored approach and have realised reductions in project implementation times by as much

as 60% over the more time-intensive process of integrating bespoke solutions.

## ASSMANG PROPRIETARY

Assmang Proprietary turned to AVEVA to centralise operations, consolidate its value chain, and increase situational awareness amongst three individual mineshafts at its Black Rock Mine Operations. Yogesh Ramjattan, Business Improvement Manager at Black Rock Mine Operations explained why the AVEVA solution was critical to success.

## SMART CITY ATAL NAGAR

Smart City Atal Nagar is now a role model for other Indian Cities. At Atal Nagar Naya Raipur, India's first greenfield Smart City, Unified Operations Centre was used to integrate grid, water, SCADA building, street lighting, rapid transport, CCTV, e-governance, energy management, traffic management systems and city help desk applications into a central command centre.

The command and control centre was inaugurated by Narendra Modi, Honorable Prime Minister, India, who termed it a role model for Indian cities. Amitabh Kant, CEO of the National Institution for Transforming India, noted that the centre was, "Extremely well conceptualised, planned, and executed. The solution will enable Chhattisgarh to technologically leap-frog. The infrastructure created is world class. The city is futuristic."

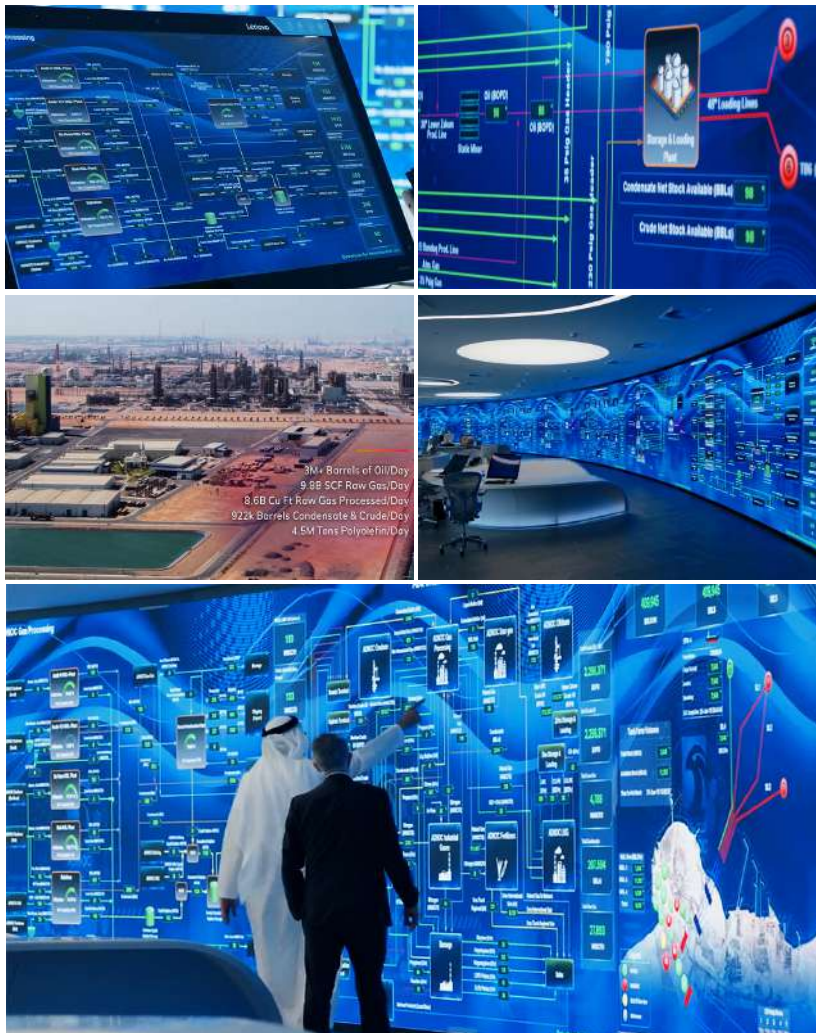
## ADNOC

Abdul Nasser Al Mughairbi, Senior Vice President, Digital at the Abu Dhabi National Oil Company,



## USE CASE

Based on a systems of systems approach, Unified Operations Centre allows plug-in and integrated apps, analytics, CCTV videos, GIS maps, ERP systems, Engineering P and ID diagrams and more.



ADNOC commented: “ADNOC’s operations across the entire value chain are vast and varied and the Panorama Command Centre gives us unified live data access across all our operations and business units. Modeling, simulations and analytics have also allowed ADNOC to drive greater production efficiencies across the board. AVEVA is a key partner for ADNOC as we continue to adopt the latest technologies and drive our Oil and Gas 4.0 mission to stay ahead of the world’s growing energy demand.”

The Abu Dhabi National Oil Company is the state-owned oil company of Abu Dhabi and the principle catalyst for the Emirate’s development. ADNOC is one of the

world’s leading energy producers. ADNOC is maximising value from its reserves and operations, and helping to drive its digital transformation is AVEVA.

No stranger to global market volatility, oil and gas producers are using Industrial IoT, big data, advanced visualisation and artificial intelligence to integrate and maximise return across asset and operation value chains. With AVEVA, ADNOC combines technology with industry expertise and proven experience into a concept they call Oil and Gas 4.0.

ADNOC’s Panorama Digital Command Centre is a fully integrated, real-time data visualisation centre that empowers

ADNOC’s sharpest minds to gain insights, unlock efficiencies, and identify new pathways to optimise performance. As ADNOC continues to be a reliable worldwide provider of energy, and with AVEVA as its partner, they can imagine and realise a more efficient, integrated, and empowered future than the industry has ever known.

### GOALS

- Empower strategic decision-making and increase collaboration across the enterprise.
- Fully align the ADNOC operations value chain, reduce the cost of production and maximise net profit.
- Improve asset reliability, availability and performance while reducing unplanned equipment downtime.

### SOLUTION

- AVEVA’s System Platform and InTouch Operations Management Interface OMI are the foundation of the display, enabling integration across various ERP, business and IT applications and providing actionable insights.
- AVEVA’s Unified Supply Chain Management solution enables complete value chain optimisation to improve collaboration, efficiency and profitability.
- AVEVA’s Predictive Asset Analytics solution empowers the team to reduce unscheduled downtime and prevent costly equipment failures.

### RESULTS

- ADNOC’s Panorama Unified Operations Centre enables savings between \$100M to \$200M through optimised operations.
- AVEVA software provides visibility across operations for improved business agility by integrating and monitoring 10 million+ tags across 120+ dashboards.
- AVEVA’s Unified Supply Chain Management solution delivers integrated and centralised monthly operating plans. ■

# How Synology is transforming video surveillance and data storage

**G**lobal storage vendor, Synology creates network-attached storage, IP surveillance solutions, application solutions, networking equipment, and accessories to support its hardware products. Using digital technologies such as cloud and mobility, Synology aims to help users centralise data storage and backup, share files on-the-go, implement professional surveillance solutions, and manage networks in reliable and affordable ways.

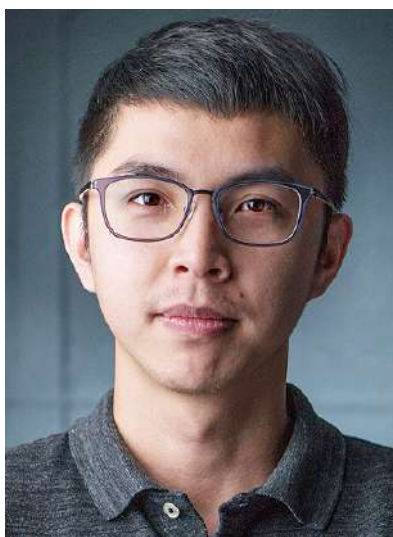
The vendor's business objective is to transform the way users are managing data, conducting surveillance, and managing networks in the cloud era.

According to Nick Jheng, Regional Manager Middle East, Synology provides a total solution and not just the hardware for data management. "Synology has a package centre just like the Apps Store and you can do so many things with Synology NAS." Synology is not just about storage space, and other than data protection and surveillance, Synology also offers collaboration, through email.

Synology solutions support end users across home, business, data protection and surveillance use cases. For the home segment end users, Synology provides solutions supporting file sharing, file syncing, and media backup and archiving.

For the business segment end users, Synology provides solutions supporting file sharing, storage for virtualisation, business email, file transfer acceleration and secure wifi.

For data protection, Synology provides data protection solutions for VMware backup, SaaS backup,



NICK JHENG,  
Regional Manager Middle East, Synology.

Personal backup, network attached storage protection, and ransomware protection. For surveillance, Synology supports solutions for small, medium and large business end users.

Synology's product range starts from models for small office and has about 20-30 types of models. "We used to focus on home user because that is where we began. But now we focus more on small and medium business and even enterprise customers," says Jheng.

Synology's flagship products are its networked attached storage, Diskstation Manager and Surveillance Station. By managing storage in an intelligent fashion, Synology has been able to build its strength in the area of deep learning for network video recording. Synology is also active in the area of enabling solutions such as Active Backup Suites, Synology Drive,

Virtual Machine Manager.

## DEEP LEARNING AND VIDEO

In August 2019, Synology launched its deep learning product NVR DVA3219, an on-premises surveillance solution that provides accurate video detection results and minimizes environmental interference with deep learning technology. DVA3219 comes built-in with NVIDIA GeForce GTX 1050 Ti GPU to power 4 real-time video analytics tasks, and up to 32 concurrent video feeds. Synology is bringing in deep learning video analytics on-premises, offering situational awareness to physical security, while ensuring customer privacy. DVA3219 delivers the full potential of video analytics in Surveillance Station, optimised by deep learning algorithms.

Another strong point for Synology's solutions, is the range of compatibility it has built with other device environments including mobile devices. Synology network attached storage works well with Windows, Windows Phone, Apple iOS, Linux, Android, amongst others. "All the common device operating software have been integrated, and are compatible with Synology network attached storage," says Jheng. "This is what we are good at," he adds.

To provide similar total cost of ownership benefits in the area of surveillance solutions, Synology has invested in its own video management system. This has helped to integrate a large portfolio of industry standard IP cameras. Synology has integrated 7,000 models of IP cameras from 120 vendors. Even if the surveillance





Synology's product range starts from models for small office and has about 20-30 types of models.



Synology is bringing in deep learning video analytics on-premises, offering situational awareness to physical security, while ensuring customer privacy.

camera is a basic model, end users can leverage Synology's video management system and its Surveillance Station product to enhance the operating and recording features.

"Any IP camera you name it, you can use almost any of them with Synology network attached storage, to manage your camera and to restore your recording," explains Jheng. End user organisations that require cost effective, reliable and quality storage use Synology solutions. The largest Karaoke

chain store in Taiwan is a Synology customer, as well as TV stations and other media channels, indicates Jheng. Regionally, some of the end users include Unilever, Holiday Inn in Riyadh, and Department of Land and Survey in Jordan.

### DEPTH OF APPLICATIONS

Synology is more about applications, rather than utility. "We have our own hardware and our own browser-based operating system, based on Linux kernel. And we have many applications on top of our

operating system. So, it is a total and multifunction solution not only for storage and not just for data protection," explains

From a competitive point of view, Synology as an end to end storage solution provider, has multiple strengths. Synology is not a pure play hardware vendor. It bundles value added applications with every hardware product. This has a positive impact on the total cost of ownership of all Synology products.

According to Jheng, most home and small office customers would look at Synology product as a hardware asset and would focus on its technical specifications and purchase price. However, as the size of the end user business scales up to small and medium businesses and enterprises, the end to end use cases that can be supported by a Synology solution become more important. This moves the focus to the total cost of ownership of the Synology solution, rather than just the asset cost.

Says Jheng, "Business users do care about the price, of course, but they care more about TCO, what we call total cost ownership." The typical questions that get raised are: Your product seems to be workable and affordable. But what are the hidden costs, if I want to bring your product into my environment, will it be fine? ■

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# HOW HUMAN RESOURCES IS BEING TRANSFORMED

Top executives explore the future of organisations and the impact of digital technologies on leaders, teams, skills, roles, and culture.



(Left to right)  
● Marketa Simkova, KPMG Lower Gulf  
● Jay Srage, Michigan Ross  
● Mansoor Sarwar, Sage Middle East  
● Conal Thompson, HireRight  
● Vasudevan KS, Navo Management Consultants  
● Chris Pope, ServiceNow



CHRIS POPE,  
Vice President Innovation,  
ServiceNow.

## AGILITY OF BUSINESS WILL DRIVE HUMAN EFFICIENCIES

Customer facing and agile businesses will transform legacy job roles into those based on outcomes and multi-functional skills.

Many organisations have had to reinvent themselves as part of digital transformation and as a result of that, so have the employees. New roles, new functions and new skills are required to operate in a digital first, customer centric environment.

Automation and digitalisation of processes have meant that manual, repetitive tasks have been eliminated and, in some cases, due to the advancement of customer maturity or the products and services being offered, many traditional activities or actions are no longer required.

Teams are multi-functional and multi-skilled, both in technology and business acumen, often forming on demand, as projects and programs are initiated. As a consequence, the ability to reskill, adapt and adopt new technologies are critical success factors and challenging traditional operating structures of the past.

The ability to be agile and adapt, be open minded and to think laterally are all essential elements of a culture

### KEY TAKEAWAYS

- Traditional infrastructure skills will fall by the way side as the public cloud removes the need that legacy technology demands.
- Customer journey mapping and experience designers will play a huge role in transforming the way an organisation works.
- The ability to be agile and adapt, be open minded and to think laterally are essential elements of culture.

DIGITAL LITERACY, ALGORITHMIC AND ANALYTICAL THINKING AND SERVICE BROKERING INTEGRATION ARE KEY SKILLS THE FUTURE EMPLOYEES WILL NEED.

where you are trying to challenge the norm and how it has always been done is no longer acceptable.

The modern employee or new hire comes to the table with a different perspective, expects more input and influence in key decision making and ethically challenges the why and not just the how. Solving existing or traditional problems with a new approach or outside in thinking enable an organisation to see new ways of working and criteria for success, which they may not have done previously.

Digital literacy, algorithmic and analytical thinking and service brokering integration are all key skills the future employees will need.

Traditional infrastructure skills will fall by the way side as the public cloud removes the need for the overhead that legacy technology demands. Customer journey mapping and experience designers will play a huge role in transforming the way an organisation works to support its customers and their outcomes.

The task-based economy is with us, and employees of today and the future are very much focused on the tasks at hand or due for immediate delivery. They expect to be judged based on outcomes as opposed to long winded process.

Many will see the list of interactions or projects as their ongoing and ever-changing measure of success and being tied down too long at a single company will be like they have stalled and not progressed or improved.

Efficiency, customer alignment and adaptability are critical attributes for any organisation that wants to have success in their digital transformation efforts.

It is critical to have the ability to move with the times, bring products and services to market in a timely and fast manner, align to customer needs, wants and desires, but as importantly, use technology to meet the customer where they are, where they want to be, and how they want to be met, on the device of their choice. ■





CONAL THOMPSON,  
Chief Technology Officer,  
HireRight.

EMPLOYERS SHOULD  
KEEP IN MIND THAT MOST  
ARTIFICIAL INTELLIGENCE  
LEARNS AS IT GOES.

## HUMAN INSIGHT STILL BEST TOOL FOR SELECTION

Usage of technology for candidate selection is not without risk and bias and human judgment still remains the best available tool today.

In today's competitive labour market, using technology to interact with job applicants faster and more effectively could make a real difference to the screening process and help companies to stand out from their competitors.

Technology can be used in a number of ways to assist with background screening. For example, a mobile-friendly candidate interface makes it easier for your candidates to take photos of their supporting documents using their devices and upload them directly. Also, an applicant tracking system integration can make it quicker for candidates to input their information, as some of it may be auto-populated from their job application.

It is important that background screening companies keep innovating and finding new ways to leverage technology, in order to improve the candidate experience and ensure the screening process is as efficient as possible, which may ultimately reduce the time to hire.

Employers should keep in mind that most artificial intelligence learns as it goes, which could present risks and have unintended consequences on the screening process.

### KEY TAKEAWAYS

- Background checks will still need human augmentation until sufficiently non-biased artificial intelligence algorithms can be created.
- Systems should be used with caution in order to reduce the risks that technology can bring to the surface.
- There is still a way to go before systems based on machine learning will not adopt biases.
- Human insight and judgment will always be necessary to find the right candidate.

For example, if an artificial intelligence application, after reviewing thousands of candidates for thousands of jobs, realises that a significant number of candidates it has recommended have certain demographic attributes, it may bias its own algorithm with a preference for candidates who first meet those criteria.

While artificial intelligence technology and automation could undoubtedly increase productivity, streamline processes and reduce turnaround time in the screening process, many technologies that are being developed are still in their early stages. Background checks will still need human augmentation until sufficiently non-biased artificial intelligence algorithms can be created, to ensure that discriminatory hiring decisions are not made.

The practice of recruitment is changing rapidly and recruiters are increasingly turning to technology to keep up with these changes, from remote video interviews to online candidate assessment centres.

Artificial intelligence systems in recruitment can help to reduce overall time to hire, automating time-consuming tasks like profile scanning in order to match skillsets to job requirements, particularly for roles with high volumes of applications. However, these systems should be used with caution in order to mitigate the inevitable risks that technology can bring to the surface.

While some believe that technology will eradicate inherent human biases in finding and choosing candidates, there is still a way to go before proving that systems based on machine learning will not also adopt similar trends and biases.

All in all, artificial intelligence and technology clearly has a supportive role to play in simplifying the background screening process, but human insight and judgment will always be necessary to find the right candidate. ■



JAY SRAGE,  
Head of Operations  
MEA, Michigan Ross  
Executive Education.

## NOT THE FIRST TIME FOR BUSINESS TRANSFORMATION

Transformation of industrial and business models is not a new phenomenon and is linked to hugely disruptive technology change.

At the turn of every industrial revolution, currently the fourth, we see a large shift across various economic sectors. Business transformation is not new. It has happened with the advancement in transportation technologies early in the 20th century on a massive scale. Digital transformation also occurred late in the 20th century with the deployment of the global Internet and mobile networks.

With every disruption, new economic sectors are created allowing for new job roles to be created. 60% of newly created jobs by 2030 will be jobs that do not yet exist. They will range from the executive level, the obvious one being Chief Digital Officer, to the individual contributor level, the obvious one being Data Scientist. At the same time, existing jobs will require redirection towards new skills ranging as well from the executive to the individual levels.

Digital transformation is an inflexion point in every business, new or legacy. The organisational structure has to adapt to this inflexion to stay competitive and contribute to the economic shift. There will be a before

THERE ARE CHALLENGES ESPECIALLY WITH BIG COMPANIES AND IT STARTS WITH THE CEO AND THE BOARD.

organisation that reflects the legacy business, a transitional organisation, and an after organisation.

The organisational structure cannot simply add a digital transformation unit and call it now transformed. The after organisation will then have the transformation embedded in every function, with the new roles becoming intrinsic to the legacy functions. So, the transformation will be gradual and not disruptive.

A new vision for the company will need to be created allowing the whole organisation and employees see the roadmap and the direction they are taking. The culture will need to even more employee centric in order to balance the automation with the people skills.

The re-skilled employees, the new roles created and the legacy roles will require all to work together, making team work, matrix organisations, and cross-functional collaboration essential for the success of the transformation. So, a culture of enabling the employees, creating an open environment that encourages feedback, and allowing every employee to participate will be critical for the execution to take place flawlessly.

We will not be able to compare legacy organisational structures to transformed organisations. The reason is that each organisation served the purpose of its economic dynamics. Legacy organisations requires a process and product-centric structures – hence the hierarchy and the functional approach. Transformed organisations will need to be more horizontal, more flexible, and become customer, employee and people-centric structures.

Artificial intelligence and automation will help customise the customer experience, it will also change procurement, product management, and customer service. So, all these functions will become more inter-related than ever, requiring a new executive mindset of collaboration than functional. There are challenges in translating that approach on the ground, especially with big companies, but it works, even at large scale companies, and it starts with the CEO and the board. ■

### KEY TAKEAWAYS

- You cannot compare legacy organisations to transformed organisations since they serve the purpose of economic dynamics.
- Digital transformation is an inflexion point in every business, new or legacy.
- The organisational structure has to adapt to this inflexion to contribute to the economic shift.
- There will be a before organisation and an after organisation.
- The organisational structure cannot add a digital transformation unit and call it transformed.





MANSOOR SARWAR,  
Regional Technical Director,  
Sage Middle East.

## IMPACT OF ORGANISATIONAL TRANSFORMATION FAR REACHING

Business and digital transformation is impacting every aspect within an organisation, culture, job roles, skills, productivity, efficiency.

The impact of digital and business transformation on companies have been nothing short of disruptive and challenging. As we seek to understand new technologies place in existing processes and systems, the greatest impact has been on traditional job roles. For instance, the potential for artificial intelligence taking over jobs and replacing humans have been dominating headlines in recent years.

The World Economic Forum has predicted that 5 million jobs will be lost as soon as next year, as the Fourth Industrial Revolution transforms labor markets, and those in administrative and repetitive tasks are likely to face the brunt of the first wave of automation.

Digital and business transformation often require cooperation across multiple business units. It rarely just impacts one department. Many business leaders are now looking at reworking organisational structures,

so as to introduce more collaborative methods, so that businesses move away from working in silos. In addition, companies have had to look at developing its employees, and retraining them so that they can fulfil more value-added roles.

An organisational culture that encourages communication and develops mutual trust across the organisational structure facilitates digital transformation. Communication and trust are both necessary when relaying messages of change, which should ideally come in stages, so that employees are prepared for the organisational change. Curiosity within an organisational culture will also go a long way, as it feeds into learning, and helps employees adapt to new changes.

Technological disruption is likely to impact jobs within the manufacturing and agriculture industries, especially for roles that are repetitive, labor intensive and precise. It is important that people ask themselves, could a machine do my job? If the answer is yes or perhaps, one should look at future-proofing themselves through acquiring new skills or professional training courses to stay relevant.

The digital workplace and mobile workers have created an abundance of new and diverse talent streams for companies to tap into, without being constrained by geographical barriers or individuals with commitments that require them to work remotely.

At the same time, those in managerial roles have to learn how to oversee a team virtually, which poses new challenges. In future, employee appraisals will be done away with, and in its place will be rolling key performance indicators and an open book performance. Employee engagement scores, such as passion levels towards a job and commitment to an organisation, will also be important when evaluating an employee.

Efficiency will be one of the most significant difference, because technology is powerful tool for transforming companies and providing that competitive edge to thrive in today's environment. However, technology on its own will only carry an organisation so far. Its utilisation is more important, and that is dependent on the leadership team of any company to lead that transformation in a coherent and cohesive fashion. ■

### KEY TAKEAWAYS

- The World Economic Forum has predicted 5 million jobs will be lost as soon as next year.
- Business leaders are looking at reworking organisational structures, so that businesses move away from working in silos.
- Digital and business transformation often require cooperation across multiple business units.
- Curiosity within an organisational culture will go a long way, as it helps employees adapt to new changes.



MARKETA SIMKOVA,  
Head of People and  
Change, KPMG  
Lower Gulf.

## REIMAGINE THE ORGANISATION BALANCING AI AND HUMANS

Forward looking organisations are already mapping the skills required in an agile and project environment with integration of AI as well.

Organisations are encouraged to transform their workforce-shaping approach from strategic workforce planning to agile workforce shaping in order to enable and exploit the opportunity to leverage capabilities that arise from digitalisation.

The key question is how best to organise the workforce, which will be significant for organisations dispatching increasingly agile project teams rapidly composed around various themes, projects and initiatives that demand alignment of key skills. As a result, it is important to reimagine the internal organisation structure based upon atomisation of tasks and skills in order to realise the benefits and opportunities from artificial intelligence.

As organisations shape and redefine workforces, cultural values are an increasingly important factor to consider. An organisation where strategy determines cultures, and the right culture determines the degree to which the strategy is successful, would be a facilitator, and accelerator for digital and business transformation.

Shaping and nurturing organisational culture is seen as an increasingly important enabler of digital

DESIGN THINKING,  
CONVERSING, TEACHING  
AND SYSTEMS WILL BE  
JUST AS RELEVANT AS  
CODING AND CREATING  
NEURAL NETWORKS.

transformation. There will be a greater need to focus on collaboration, engagement with strategy and ability to build new skills amid emerging task requirements, if traditional job structures and careers are less prominent.

Occupations that are less susceptible to being digitised include those that require creativity, social interaction and intelligence and or the ability to perceive and manipulate things requiring high manual dexterity. Five years from now, over 35% of skills considered important in today's workforce will have changed.

As machines begin making decisions for us, skills such as negotiation and flexibility will decrease in significance, whereas the skill of creativity will need to be nurtured. Additionally, capabilities such as design thinking, conversing, teaching and systems will be just as relevant as coding computer programmes and creating neural networks.

Artificial intelligence will deliver opportunities for employees to play with their strengths while encouraging new levels of productivity and value to employers. Employees may be evaluated on productivity gains which may only be realised if work, processes and organisations are reinvented to assign, integrate and optimise roles performed by machines, humans with machines and humans alone.

The significant difference would be that smart organisations are already aware of the speed at which artificial intelligence will disrupt and redefine work demands with an immense sense of urgency to equip people with skills that are aligned for the future workplace.

Forward-looking organisations have readily grasped the wisdom of reinventing their workplaces in order to optimise the contribution of humans and artificial intelligence technology. To move forward today, the inevitable changes that will unfold in the workplace over the coming years should be addressed in order to adapt, evolve and succeed amidst artificial intelligence increasing impact. ■

### KEY TAKEAWAYS

- Smart organisations are aware of the speed at which artificial intelligence will disrupt and redefine work demands.
- Forward-looking organisations have grasped the wisdom of reinventing workplaces in order to optimise contribution.
- Organisations are encouraged to transform from strategic workforce planning to agile workforce shaping.
- Strategy determines cultures, and the right culture determines the degree to which the strategy is successful.





VASUDEVAN KS,  
Managing Director, Navo  
Management Consultants and  
Business Transformation Coach.

## VALUING HUMAN SKILLS IN A WORLD OF TRANSFORMATION

While repetitive skills will be automated inside organisations, human skills such as creativity, innovation, will remain in demand.

Digital services and digitalised practices continue to change practically every business model. And every time such a revolution occurred, it has led to humans adapting to a new normal while acquiring new skillsets and creating new job roles. The pace of change in the current IR 4.0 is undoubtedly faster than earlier situations.

Hence any job that is repetitive, predictable and situation based can and will be automated; giving rise to new job responsibilities that can work in tandem with automated processes.

Human skills such as creativity, innovation, critical thinking, problem solving, resilience, mental elasticity, collaborative working, purposeful listening and more will underline employability. At a leadership level, the world will look for digital visionaries, smartness in risk taking, situational brilliance, perpetual agility, curiosity in everything, natural collaborative approaches.

Any organisation progressively engaging in digital and

THE WORLD AHEAD  
OF US IS VOLATILE,  
UNCERTAIN, COMPLEX  
AND AMBIGUOUS.

business transformation will have to investigate business model change and test its relevance for tomorrow. Digital transformation is all set to have a direct impact on routine jobs.

Mid-level job categories will be forced to re-skill in order to stay relevant and a strategic adaptation and new age skills will be called for at a leadership level. Digital transformation is set to drive efficiency in every aspect of its deployment. However, when the machine efficiency is augmented with an elevated human intelligence the results shall not only be disruptive, but highly rewarding too.

Two key cultural elements that will drive success and provide continuous acceleration to organisations are employee engagement and happiness and innovation. Both are to be driven right from the top. Awards, certification and sloganeering alone is not enough. Customers can see through this, hence organisations will have to start showing real deliverables. You see, it is not a one-time transformation. Continuous transformation is the new normal.

Anything that is repetitive is no more a skill. Anything that can be digitised, any process that can be digitalised, any business model that can be digitally transformed will happen so.

The world ahead of us is volatile, uncertain, complex and ambiguous. One cannot afford to deal with it with a sense of complacency. The situation calls for a change in thinking and not to recycle from one's own experiences however successful they might have been.

Regular measurable KPIs, innovation contribution index, happiness contribution index, shall play a greater role. Conventional appraisal system must be dismantled to pave way for a new system where process and purpose takes center stage than just top line, bottom line numbers.

Digitally transformed organisation will have greater ability to deliver new age customer experiences. In addition, they will be constantly cost optimised and agile which will give a greater competitive edge over legacy organisations. In simple terms, legacy organisation will find it hard to survive – however big or small. ■

### KEY TAKEAWAYS

- The situation calls for a change in thinking and not to recycle from one's own experience.
- Regular measurable KPIs, innovation contribution index, happiness contribution index, shall play a greater role.
- Conventional appraisal system must be dismantled to pave way for a new system where process and purpose takes center stage.
- Anything that is repetitive is no more a skill.
- Any business model that can be digitally transformed will happen so.
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# PURE STORAGE IS INFLUENCING AUTONOMOUS VEHICLE INDUSTRY

Clever innovations early-on both in hardware and software, have brought Pure Storage into a position to influence the autonomous vehicle industry.



BY: ARUN SHANKAR

**D**igital transformation is disrupting legacy business models and traditional supply chain relationships across all market segments. Manufacturers of vehicles whether cars, transport or delivery vehicles are experiencing a shift in the sales and consumption models. Business models are changing, from purchase of vehicles as an asset towards consumption of trips as a service.

A customer may hire a vehicle and drive it as they require and then return it after their service requirements have been met. The usage of vehicles in such a manner, is increasing the demand for geolocation mapping, while trip and fleet management are becoming a critical part of productivity and profitability. The ability to make vehicles autonomous for long distance routes, delivery and for parking can also help reduce the overheads associated with human driven vehicle movements.

Says Alex McMullan, CTO International, Pure Storage, "The car manufacturers are obviously seeing the big general switch from the individual ownership model into the rise of the shared ownership where car rides sharing, or car leasing are becoming much more attractive." In order to meet these requirements, vehicle manufacturers have no choice but to make their vehicles increasingly intelligent and rebuild them to meet the use cases of self-driving and self-parking.

"So that is where they see the most potential for millennials or teenagers because they are much more used to the shared ownership model. All the big car companies are developing autonomous capabilities, some are more than others. That is the real driver for them on that side," adds McMullan. "The other side is really how to get more telemetry back from the cars to get them more efficient, more reliable,

and to fix faults before they occur," he continues.

As a storage solution provider, Pure Storage works closely with Zenuity, a modern automotive software company. Zenuity, which is a joint venture between Volvo Cars and Autoliv, is racing ahead on the road to autonomous driving, with software powered by deep learning. Zenuity has built its artificial intelligence infrastructure on NVIDIA DGX-1 and Pure Storage FlashBlade.

This is intended to make autonomous vehicles, smarter and safer. Zenuity will develop the software brain of the car, while Autoliv will bring the technology to the global market. Data scientists can process the amount of data needed to ensure safety without compromising their product timelines.

#### CLEVER POSITIONING

Pure Storage is working closely with players like Zenuity to provide them the most optimal software to manage analytics and machine learning from data generated internally in autonomous vehicles. While Pure Storage has traditionally been a datacentre storage infrastructure provider, McMullan believes that role of providing storage within vehicles, will be either commoditised or will be of limited scale in connected vehicles such as drones. "A drone is not going to carry an array around," he points out.

Across the ecosystem of autonomous driving, including manufacturers of the vehicles and the developers of software to help enable autonomous driving, Pure Storage believes it can deliver the best value in the preparation of the data, software, and the machine learning models. These will be required for all types of autonomous vehicles to function intelligently at the edge of the network. McMullan describes it as, "training of the actual creative capability that sits



ALEX MCMULLAN,  
CTO International, Pure Storage.



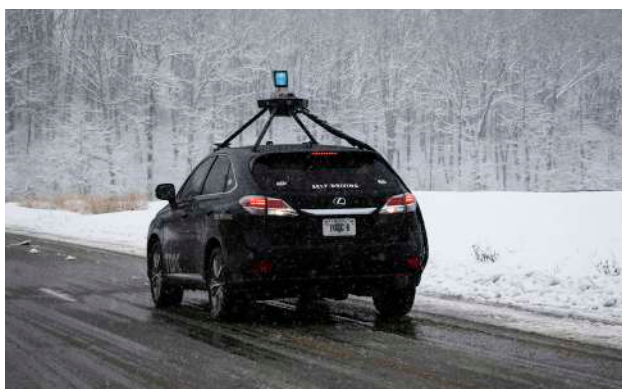
## MARKET OUTLOOK



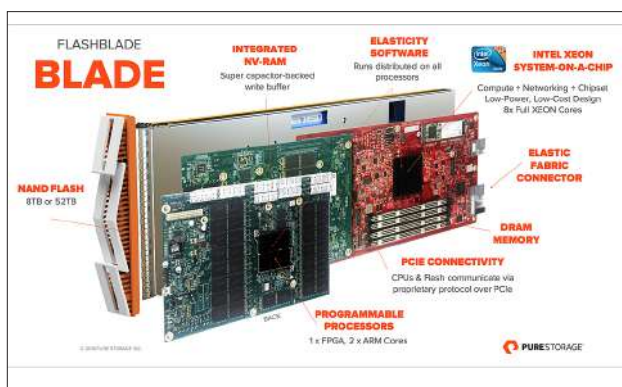
Daimler Truck plans to increase the automation level to SAE Level 4, on US roads.

SAE J3016™ LEVELS OF DRIVING AUTOMATION					
SAE LEVEL 0	SAE LEVEL 1	SAE LEVEL 2	SAE LEVEL 3	SAE LEVEL 4	SAE LEVEL 5
<b>What does the human in the driver's seat have to do?</b> You are driving whenever those driver support features are activated - even if you feel just off the pedals and you are not steering. You must constantly supervise those support features; you must steer, brake or accelerate as needed to maintain safety.			You are not driving when those automated driving features are activated - even if you are involved in the driver's seat.		
<b>What do these features do?</b> These features are limited. In providing warnings, and maintaining awareness.			<b>These are automated driving features:</b> These features can drive the vehicle under limited conditions and will not operate unless all requested prerequisites are met.		
<b>Example Features:</b> • Automatic emergency braking • Lane departure warning • Adaptive cruise control			• Traffic jam assist • Highway driver assistance • Remote driving • Full self-driving		

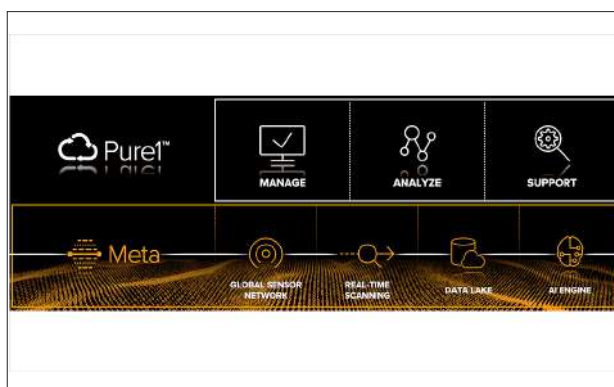
The ability to manage the data stream can make a difference between an intelligent and safe car that can progress along the six levels of driving automation as specified by SAE International.



Torc Robotics kicked off Project Asimov in 2017, which is essentially an advanced self-driving unit, that includes two Lexus RX vehicles, retrofitted with self-driving application stack.



The global flash arrays that support IoT type uses cases are built on Pure Storage's Flash Blade.



Analytics generated through Pure Storage's global flash arrays are integrated using Pure 1, a SaaS based public cloud application, and hosted at AWS.

## KEY TAKEAWAYS

- Pure Storage is working with Zenuity to provide analytics from data generated inside autonomous vehicles.
- NVIDIA DGX-1, DGX-2 and Pure Storage FlashBlade work in tandem inside AIRI.
- Along with NVIDIA, Pure Storage developed AIRI compute and storage platform.
- Commodity protocols will drive down costs inside the actual autonomous vehicle.
- Hundreds of autonomous vehicles can overwhelm commodity servers by generating Terabyte+ data per hour, per vehicle.
- Autonomous vehicle software developers are investing hugely in GPU-powered deep learning infrastructure.
- Cars, ships, trucks are supported by the same use case supported with FlashBlade.
- Difference between demonstrating a self-driving vehicle and selling a self-driving vehicle to customers.
- Huge challenge for automotive industry as connectivity and data-intensive software will fundamentally change value chain.
- Pure Storage believes it can deliver best value in preparation of data, software, and machine learning models.

inside the car,” rather than having its hardware embedded inside the vehicles or drones.

Autonomous vehicles including cars, trucks, delivery vehicles, buses and drones rely on various types of sensors including laser emitting range finders, mapping in 2D and 3D called LiDAR, as well as cameras. This produces a steady stream of data that needs to be structured, managed and processed. The ability to manage this data stream can make a difference between an intelligent and safe car that can progress along the six levels of driving automation as specified by SAE International, or a vehicle that essentially never progresses beyond Level 1.

McMullan stresses that Pure Storage only sits in the technology stack that gets to define the standards in terms of the data path. For the rest of the standards in terms of compute architecture and applications, Pure Storage complies with the standards set by partners like NVIDIA that is specifying the CUDA API for machine learning, and Kafka amongst others.

“We enable the engineers, developers, designers, data scientists to create the mathematical models to analyse all those camera photos or LiDAR images, which are then allowing the car to make steering and stop-go decisions. So, it is building the intelligence that goes inside the box and inside the vehicle. Our real value proposition is in software delivery and preparation that goes inside the autonomous vehicle, whether that is car or a drone. We are helping in creating better software, better models, and more smart machines. That is where we will be most successful,” elaborates McMullan.

“We do exactly the same thing with drone companies as with autonomous cars – we refine the software. We refine the code they have in place to fly the aircraft. That is the benefit they get from Pure Storage. So not just the cars

but on the drone side as well,” says McMullan.

For the connected and autonomous vehicle use cases, McMullan believes the best value for Pure Storage and the industry can be demonstrated if Pure Storage sits in the datacentre or at the edge of the network, and not inside the car itself as a hardware provider. Pure Storage is also transferring the learnings it has gained from operating its flash based, global IoT mesh network, to the connected and autonomous vehicle industry.

Analytics generated through Pure Storage’s global flash arrays are integrated using Pure 1, a SaaS based public cloud application, and hosted at AWS. The global flash arrays that support IoT type uses cases are built on Pure Storage’s Flash Blade. “We are already running an IoT mesh. All of our arrays are part of that live use case and we have been doing this for the last five years. One of the reasons we developed the FlashBlade product line was we saw real value and options around how to make an IoT mesh. Cars, ships, trucks can all use that same use case,” explains McMullan.

“I think commodity protocols will drive costs down inside the actual [autonomous] vehicle. And that is not really a value proposition for us. We are much more valuable to any car company further up the stack in making the software more intelligent,” repeats McMullan.

## ARRIVAL OF AIRI

Moving forward, digital organisations leveraging artificial intelligence or advanced machine learning or deep learning tools, will increasingly have to worry about whether they have or do not have sufficient compute capability in their datacentres. This is also described as having GPU-accelerated deep learning capability.

For many businesses embracing digitally advanced applications, their future data workloads can justify an



# AUTONOMOUS SHAKES UP VEHICLE MANUFACTURERS

Daimler Trucks is the world's largest manufacturer of heavy and medium trucks. It is now acquiring a majority share in Torc Robotics, a US based vehicle automation solutions business. Torc Robotics kicked off Project Asimov in 2017, which is essentially an advanced self-driving unit, that includes two Lexus RX vehicles, that have been retrofitted with the vendor's complete self-driving application stack.

The purpose of tying up with Daimler Truck, beyond a mere alliance arrangement, is to raise the automation level of Daimler' trucks to SAE Level 4, on US roads. The mission of Torc Robotics is to commercialise self-driving technology to make the world a safer place. Torc Robotics has released a list of 60+ autonomous actions as part of its stack.

In November 2018, autonomous car start-up Aurora announced it has received \$500+ million in funding from Amazon and Shell's investment arm Sequoia. With Amazon's delivery costs exceeding \$27 billion in 2018, early adoption of self-driving vehicles can help it reduce this overhead in the future.

Aurora's founders have experience in the automobile industry and were previously working at Uber and Tesla. Aurora Driver, Aurora Cloud, Logistics, Fleet Management, Mobility, are the solutions that it is offering car manufacturers to help them accelerate on the autonomous road map.

Volvo Cars has reached an agreement with Baidu, the Chinese Internet search provider, to jointly develop electric and fully autonomous drive-compatible cars with the aim of mass producing them for China, the largest car market in the world. Volvo Cars is the first foreign car maker to collaborate this closely with Baidu to jointly develop customised autonomous driving cars.

The partnership will allow both companies to develop and sell these vehicles to potential Chinese customers, underlining the Swedish company's aspirations to be the supplier of choice for mobility companies globally.

Industry forecasts show that China is likely to become the single largest market for autonomous cars in the world in coming decades. Market research firm IHS Markit predicted earlier this year that around 14.5 million autonomous cars will be sold in China by 2040, on a total global volume of around 33 million.

investment in deep learning compute power. Autonomous driving software development is one such example. Hundreds of autonomous vehicles can easily overwhelm commodity

server compute power, by generating over a Terabyte of data per hour, per vehicle. This is driving autonomous vehicle software developers to invest hugely in GPU-powered deep

learning infrastructure.

Since the use case is very data intensive, another role that Pure Storage is playing is to help the industry players develop their capabilities in artificial intelligence. Along with NVIDIA, Pure Storage has developed the AIRI, .

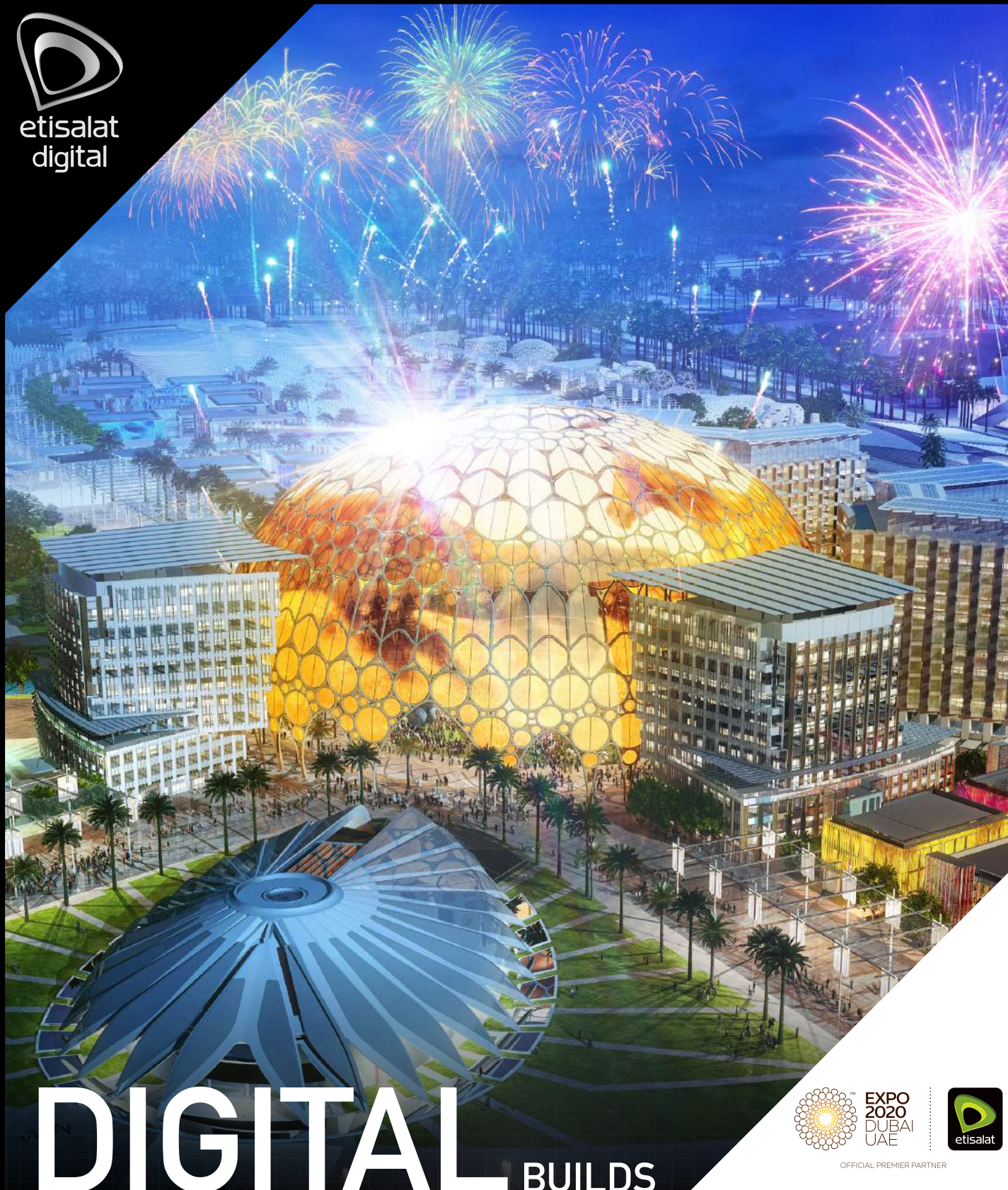
which is the short form for AI-Ready Infrastructure and is a converged infrastructure offering for deep learning. AIRI is built on Pure Storage FlashBlade and NVIDIA DGX-1 and DGX-2 servers. NVIDIA DGX-1, DGX-2 and Pure Storage FlashBlade work in tandem inside AIRI, to eliminate bottlenecks that could have previously hindered the ability to feed GPUs inside DGX-1, DGX-2 with data.

AIRI leverages the power of the NVIDIA DGX-1, DGX-2 AI supercomputer and combines it with Pure Storage FlashBlade. AIRI uses the dual vendor appliance as a modular building block for scaling AI capacity in any enterprise. AIRI's design has been shaped by real-world deployments.

Pure Storage is accelerating the development and adoption of applications using artificial intelligence and deep learning through its solutions on both the software and hardware side. It is helping the vehicle and drone industry, the key players and early adopters of deep learning software, to transform by bringing together the pieces of the puzzle for them.

"That is why we created it [AIRI] in the first place so that developers and data scientists can actually stream data without having to learn about the infrastructure. That is part of the Pure Storage value proposition," says McMullan. "We have a strong play in both those use cases." ■





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# PREPARING DATA TO GENERATE LEARNINGS AND PATTERNS

In order for applications to become intelligent, they need to be trained by getting them to compute vast lakes of data using special hardware.

Organisations run at the speed of their data. While artificial intelligence and machine learning have a continuing history of solving traditional problems in pattern recognition, artificial intelligence and machine learning techniques are rapidly finding their place in business analytics, where the patterns being determined might be less obvious. The efficiency of these learning systems can define an organisation's competitive advantage.

Machine Learning has long been implemented on top of traditional compute architectures. The increasing volume and velocity of arriving data are stressing these architectures, whether for real-time processing of IoT telemetry, pattern recognition in images or audio, or mining data from the warehouse to gain new insights.

Stated simply, Machine Learning is the application of special algorithms that are adept at identifying patterns in datasets. The more data there is for these algorithms to explore, the better the results tend to be. Data from which patterns should be extracted are run through these algorithms in a process called training. Once patterns emerge, the results can be used to identify similar patterns in new datasets.

## GETTING DATA TO LEARN

First, there is supervised learning, where human intervention is

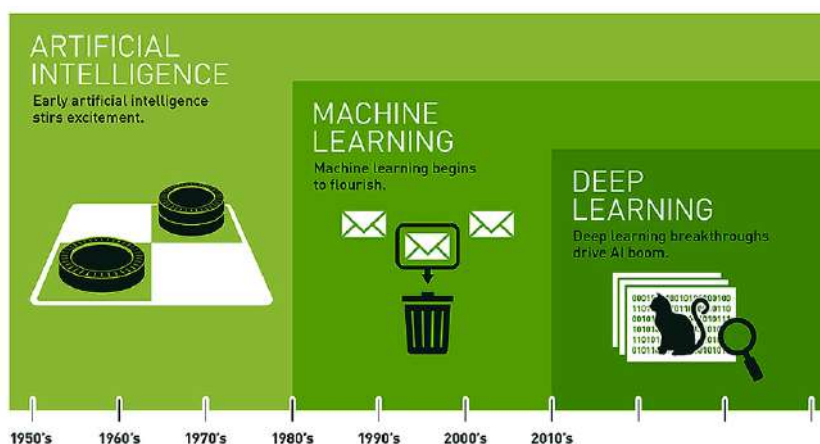
required to direct the desired outcome of learning. Imagine the act of training a computer to recognise the picture of a cat. The algorithms can be fed tens of thousands of variations of cat images, along with some images that are not cats, in order to instruct it to recognise the feline animal when presented with a picture of it in the future. Supervised learning relies on human or machine labeled datasets to tell the system when it is a cat image, and when it is

not, so that it can learn.

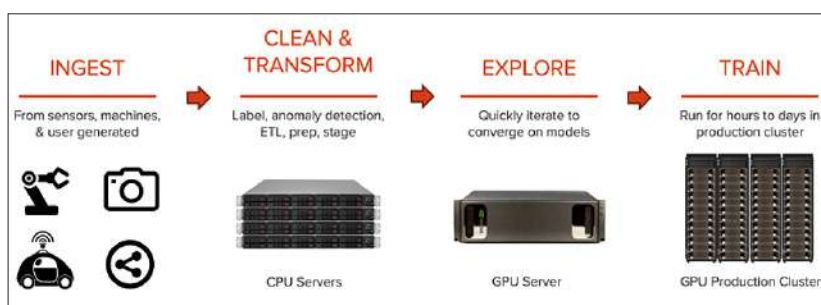
Second, is unsupervised learning. As its name suggests, unsupervised learning explores unlabeled datasets and identifies patterns that may not be obvious to humans. This is an area that is extremely active in the business world today, as unsupervised learning can find patterns in customer transaction data, health data, financial trading and many others. Despite the differences in how learning might



Usage of Pure 1 from Pure Storage for cloud-based insights. (Source Pure Storage)



Transition from legacy artificial intelligence to deep learning. (Source NVIDIA)



Training data and applications to become intelligent. (Source Pure Storage)

work for a given dataset and desired outcome, there are very common traits in how systems are built to ingest data, learn from it, and store it to learn again in the future.

## FOUR STAGE PROCESS

The first step is ingesting the data that the training algorithms will examine. Data is brought into the workflow from outside. This could be from any number of sources. Maybe it is real-time data, from an array of sensors, or it could be data generated by business operations and stored in the traditional storage arrays in the enterprise datacenter. Often, it is data that was used in learning previously, and tested again by the training algorithms as they have evolved. In all of these cases, the data is moved from its source to persistent storage somewhat closer to the learning environment.

Before being analysed by the learning algorithms, the ingested

data needs to be prepared. This is the cleaning stage. Algorithms may be run on it to detect anomalies, remove duplicate data, enrich the data with meta-data tags, or perform any number of other tasks based on the goals of the analysis. This is data intensive, but not always computationally taxing. The speed of the process depends on the efficiency of moving the data through the cleaning process.

Once data is ingested and cleaned, the training algorithms are almost ready to execute. Often times a number of experiments will be run on the datasets to help set the stage for the actual learning process. This is the exploration phase, where researchers work with the data to understand and help guide the learning process to come.

Finally, there is the training stage. There are numerous variations on what happens during this phase. The process can take anywhere

from hours to weeks depending on the goals of the learning. The important thing to note is that it is computationally taxing, and the efficiency and duration of the process is a combination of the effectiveness of the compute engines, coupled with the ability to keep relevant data fed into them.

## DEMANDS OF LEARNING

While thinking about the four basic steps of machine learning, it is instructive to think about the shape and characteristics of the data as it traverses the workflow.

Ingestion is fairly simple. Data enters the workflow. This data tends to arrive as sequential writes of various sizes depending on the source. This means the data streams into a storage array at a relatively unchallenging rate.

Cleaning becomes more taxing on the data. The access patterns become more unpredictable, generating both reads and writes to the disk, in both random and sequential patterns of varying sizes. Cleaning and preparation tend to be as taxing on the storage systems as it is computationally. Cleaning touches all of the data, and in unpredictable patterns. The underlying storage must be matched to activity.

Exploration and training are both very read-heavy processes. As the data is explored and churned on by the training algorithms, it is read over and over again. The access patterns are not predictable in a reasonable sense, and tend to be very small transactions from the storage systems feeding them. Training requires many small objects. The efficiency of the algorithms is directly tied to the effectiveness of the persistent storage underlying the process.

## WHERE IS THE BOTTLENECK

Efficient machine learning is not all about the capabilities of the compute engine. Modern compute is demanding more data at a faster velocity than traditional



# DEEP LEARNING ENABLED BY NVIDIA'S CUDA LANGUAGE

It requires a tremendous amount of computational horsepower and data volume to process today's machine learning. The recent revolution in machine learning, driven by deep learning, occurred due to a number of converging innovations. DRAM became relatively cheap and plentiful. In-memory computing models rapidly evolved to where, instead of fetching data from external storage, streaming data is fed into the same domain as the processors performing the analytics.

At the same time, the graphics processing unit, GPU became about more than just delivering fast action to first person gamers. It turns out that the parallel processing units in these GPUs are really good at executing exactly the kinds of algorithms required to satisfy the demands put forth by machine learning. While fast processors are great, GPUs have historically been difficult to programme. As a leader in GPU innovation, NVIDIA worked to lessen the burden of programming GPUs by innovating a language called CUDA and a wide range of tools to help the data scientists who develop the training algorithms. The GPU software ecosystem has blossomed, becoming the enabler for a constellation of new deep learning algorithms.

infrastructure's capability to deliver. The latencies and throughput of the storage systems housing the data directly impact the performance of the system. Facebook recently published research showing that Ethernet-based networks are sufficient in providing near-linear scaling capabilities. Data bottlenecks lie in the storage layer, and the storage system's capability to deliver tremendous throughput at low latencies.

Latency is the amount of time that it takes for a transaction between two devices to complete. Data must traverse the interconnect between the processing node and the storage device, resulting in a certain amount of latency. The speed of the disk, which ultimately serves up the data, has significant impact on the amount of time it takes to respond to the transfer requests.

Traditional platter-based hard

drives require a request to wait for a number of mechanical operations to occur, while SSD-based storage systems typically respond very close to the speed of the silicon supporting the storage, lowering the latency. However, many storage vendors using off-the-shelf SSDs quickly hit performance limitations due to serial interfaces to the SSDs and legacy software bolted on top of the system to manage the SSDs.

Complicating things even further are the access patterns inherent in machine learning. While ingestion is a relatively straight-forward streaming of sequential writes, the remainder of the process tends towards very small random reads. Intelligent storage systems compensate for the relative slowness of the underlying persistent storage media such as spinning hard disks, or even SSDs by attempting to discern patterns in data access and

fetching that data before it is needed. The more random the pattern, the harder that is to do.

A storage system can be tuned to meet the needs of machine learning. There are three major factors that influence the ability of a storage system to provide fast and effective data to a machine learning infrastructure:

## LOCALITY OF DATA

One of the biggest causes of latency is the amount of time that it takes to bring data from a storage device to the processor that will consume it. Locating data near the machine learning cluster that will consume it is a necessity. Utilising an array that is capable of spreading its data across a large number of storage processing devices will drive latency down even further.

## ACCESS PATTERNS

Small block, unstructured data being accessed randomly is the norm for machine learning. This type of access pattern has historically been the most difficult design point for any storage system to meet. A storage array that can optimise itself to respond to those patterns is a key requirement of any machine learning architecture.

## CAPACITY

Machine learning thrives on data. The more data, the better the results. Moving data between multiple storage systems and the compute elements hosting the machine learning algorithms is a major impactor on overall efficiency. At the same time, machine learning tends to breed new appetites for data. Machine learning is complex, time-consuming and data heavy. Storage and delivery of data can dramatically influence the efficiency of a machine learning environment. ■

*Excerpted from, Storage-optimised machine learning by Moor Insights & Strategy.*

# HOW AUTOMATION CAN BOOST THE PRODUCTIVITY OF HR

By integrating artificial intelligence and customer relationship management, businesses can enhance customer satisfaction and loyalty writes Ali Hyder at Focus Softnet.



ALI HYDER,  
Group CEO, Focus Softnet.

Artificial Intelligence is no longer a science fiction concept, it is very much reality now. The impact of the technology is notable in every tool it is integrated with. Artificial intelligence-driven software thrives on data and analyses them to anticipate customer requirements, without being mentioned.

Though artificial intelligence is not replacing human resources completely, it is going to make their tasks much easier and effective. Organisations dealing with data in

a huge volume or the information that is collected about prospects and customers from a variety of sources are more likely to get benefitted with this technology.

It further supports constant monitoring of customer status and triggers notifications, based on predefined parameters, to remind users to perform their anticipated tasks.

This way, not a single event gets unnoticed and customer service representatives can respond to the queries with the right intent and at the right time. Improved service delivery leads to loyal customers.

Dedicating valuable time and resources on invalid leads is frustrating and in the long run, often results in huge business losses. When paired with customer relationship management, artificial intelligence leverages predictive lead scoring to classify leads on the basis of their probability of conversion.

This practice reforms the capability of users and empowers them to identify serious buyers, delegate resource wisely, and enhance ROI.

Virtual assistant makes customer relationship management systems more manageable with artificial intelligence voice-based commands. When these applications are asked to present the detailed sales report of a particular period or check the revenue generated from a marketing activity or any other related queries, they immediately access the database and display as well as voice out the results.

These virtual assistants make key-entry based customer relationship management handling redundant, thus easing out multitasking with accuracy.

Artificial intelligence-driven software works on an advanced algorithm to segment audiences by extensive attributes. Users gain precise information on customer likes or dislikes and other purchasing behaviors. This allows a more controlled approach in fabricating sales and marketing activities that leads to more targeted outreach, thereby setting the stage for faster revenue generation while eliminating the slips.

Every lead lost is a loss to the business. The more the volume of leads, higher is the chance of mishandling them. Artificial intelligence-driven customer relationship management systems eliminate this issue. The applications patch up all the leaks in the sales pipeline, ensuring no lead goes unnoticed. These advanced solutions act as lead-generation powerhouses that have proficiency in increasing outputs while keeping the quality intact.

Artificial intelligence-enabled software can analyse customer transaction, feedback, and review to determine their tone and predict their intent. This, in turn, helps these systems create tailor-made responses to improve customer conversation, resolve customer queries faster, increase their trust and improve brand loyalty. ■



## Automated seating design at Coca-Cola Arena

Opened in June 2019, Dubai's Coca-Cola Arena is expected to revolutionise the live entertainment industry in UAE and Middle East. The fully air-conditioned, 17,000-capacity arena will establish Dubai as a major destination on the global events circuit. It is capable of hosting live shows 365 days a year. Coca-Cola Arena's automated seating design means it can be adapted to international and local events of all sizes. The region's largest multipurpose indoor arena, Coca-Cola Arena is owned by Meraas, a Dubai-based holding company, and managed by AEG Ogden, a global venue management company.



## TAG Heuer, Porsche in Formula E championship

TAG Heuer and Porsche have entered a long-term agreement for their Formula E engagement, as the Swiss luxury watchmaker becomes Title and Timing Partner. The entry into the ABB FIA Formula E Championship 2019 to 2020 will be under the name of TAG Heuer Porsche Formula E Team. TAG Heuer has been synonymous with motorsport since the earliest part of the 20th century. The Swiss luxury watchmaking company is also one of the founding partners of the ABB FIA Formula E Championship, which continues to gain momentum and fans all over the world.





## Sports ambassadors representing innovative style

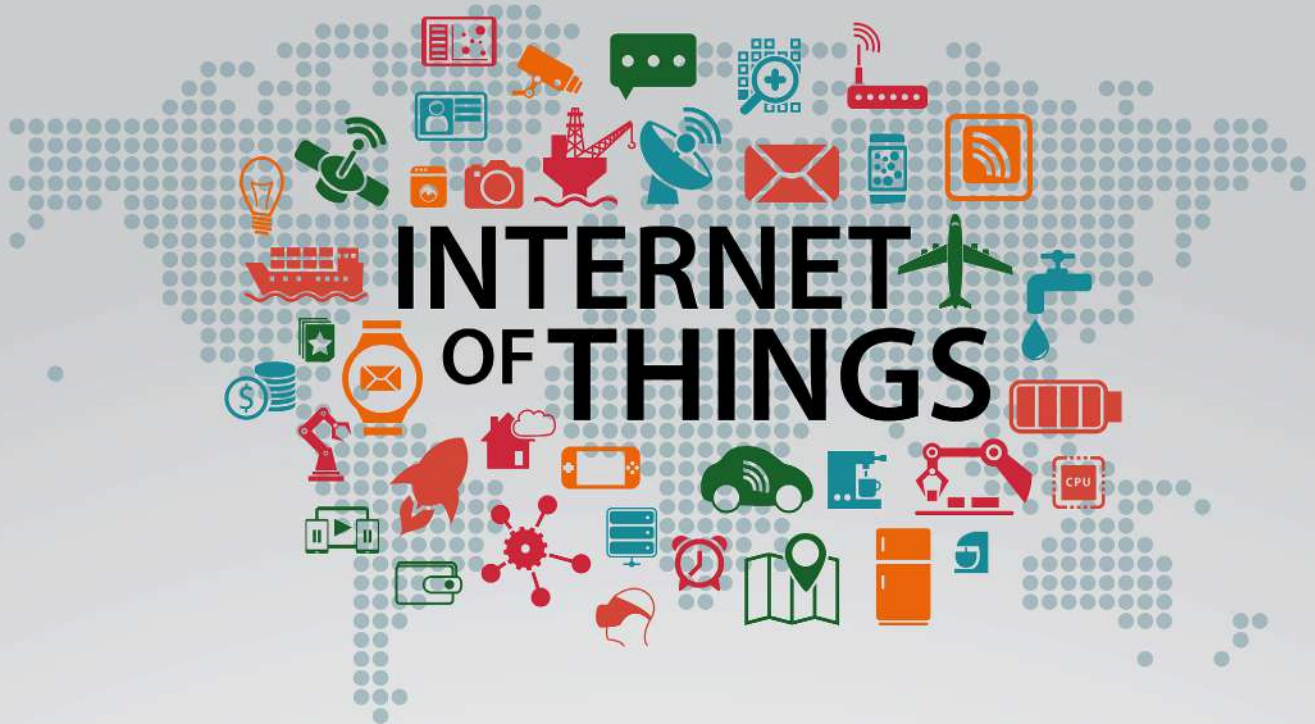
Promising young players disrupting the tennis rankings, including Felix Auger Aliassime, Alex de Minaur and Frances Tiafoe, are recent additions to the TAG Heuer team. They join existing brand ambassador Denis Shapovalov. TAG Heuer's campaign highlights mental strength, innovative playing style, and youthful energy. Strength, power and determination can only get a player so far in their game. Precision and right equipment are essential to taking home the trophy. By selecting players whose careers have only just begun, TAG Heuer focuses on drawing attention to the next generation of talent.

## New Aquaracer sports models for women

Equipped with features and functions that suit an active lifestyle on land and at sea, the Aquaracer from TAG Heuer is a stylish tool that reflects daring spirit. With three new 35 mm models, the Swiss watchmaker has created a timepiece for a life of rewarding experiences. The most eye-catching aspect of the new 35 mm Aquaracer models is the splash of blue. The blue dial has a reflective sunray effect and engraved sand-wave pattern. The stainless-steel models with a blue dial are presented on a stainless-steel bracelet or rubber strap in the same shade of blue.







**Middle East & Africa (MEA)  
IoT Market to Reach  
\$17.6 billion  
by 2023**

IDC forecasts spending on IoT in MEA to grow at a CAGR of 19.2% over 2019–2023 period.

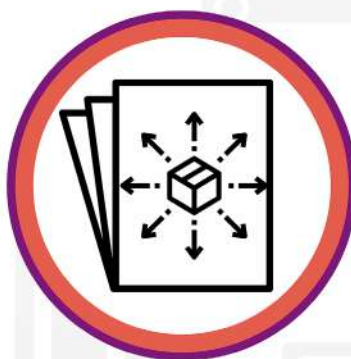
*Source: IDC Worldwide Semiannual IoT Spending Guide. The IDC worldwide semiannual IoT spending guide tracks up to 82 use cases by 14 technologies across 20 industries in 53 countries.*

## Top six **use cases** as a proportion of total MEA IoT spending in 2023



**7.2%**

Manufacturing  
Operations



**6.4%**

Production Asset  
Management



**5.9%**

Electricity  
Smart Grid



**5.1%**

Smart Home



**5.4%**

Remote Health  
Monitoring



**4.4%**

Public Safety  
and Emergency  
Response

Source: IDC Worldwide Semiannual IoT Spending Guide. The IDC worldwide semiannual IoT spending guide tracks up to 82 use cases by 14 technologies across 20 industries in 53 countries.





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