

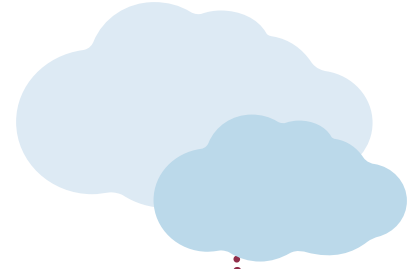
CLOUD: Opening up the Road to Industry 4.0



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Welcome to the new industrial revolution



With agile and innovative digital business models threatening the existence of established companies in almost every sector, businesses that fail to embrace change and transform their own offering will very soon find themselves adrift or potentially even extinct.

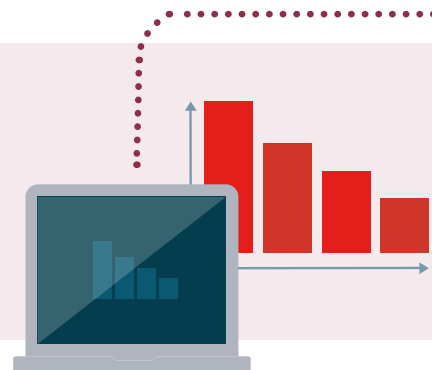
The extent of this threat is heightened further by uncertain economic times in many global markets. But there is an opportunity in such a stark 'do or die' dilemma. Those companies who act most decisively will not only ensure their own futures, but stand to capitalise on the inactivity of others.

The dramatic rate of innovation arising from this imperative to transform has created a revolution across industries. Technologies such as Internet of Things (IoT), robotics and automation have ushered in a fourth age of widespread change known as 'Industry 4.0'.

These technologies, along with big data and analytics, the rapid development of apps and the evolution of mobile services sit at the heart of this new industrial revolution and all of them run on the cloud.

The way in which these technologies are applied depends on the business. For example, a manufacturer may want to use IoT and robotics to automate maintenance on a production line. In contrast, financial institutions could use automation to cope with an ever-increasing volume of data. The automation of certain operations – such as customer service or the generation of status reports – means organizations can reduce complexity, making it easier to manage areas such as security and risk.

“Technologies such as the Internet of Things, robotics and automation have ushered in a fourth age of widespread change known as 'Industry 4.0'.”



Uniting all the different uses cases is the need to have data accessible, available and joined-up to deliver new processes and applications – something the cloud is perfectly set up for.

In this report we examine how cloud is enabling businesses to innovate quickly and efficiently, with almost infinite scale to grow. We also look at how businesses can deliver effective change and avoid the obstacles in their path.

Beware the innovation slow lane

Businesses are increasingly seeing the cloud as a blank canvas upon which to innovate freely. Research commissioned by Oracle found that 60% of businesses see an integrated enterprise Cloud Platform as the route to unlocking the potential of disruptive technologies at the heart of industry 4.0, such as robotics or artificial intelligence. This is due to the scale and the speed provided by cloud.

Do you see an integrated enterprise Cloud Platform as being an opportunity to capitalise on each of the following applications?

	Total	UK	Germany	Nordics	Switzerland	France	Italy	Benelux	Spain	Poland	Turkey	South Africa	Gulf States
Cloud based machine learning	60%	55%	65%	59%	59%	63%	57%	58%	62%	53%	56%	60%	68%
Artificial intelligence	56%	47%	61%	67%	57%	53%	55%	61%	64%	63%	51%	53%	53%
Robotics	61%	60%	65%	65%	54%	65%	58%	66%	53%	58%	62%	74%	52%

Businesses are now able to implement these technologies across their organization. Robotics is currently being implemented or has a planned implementation for 62% of EMEA businesses surveyed. Similar numbers of respondents have implemented, or are planning to implement artificial intelligence (60%) and cloud-based machine learning (63%).

60%

of businesses see an integrated approach to cloud as a way to unlock the potential of disruptive technologies.



However, these findings reveal there are still plenty of businesses who are yet to explore the potential of Industry 4.0 technologies. A reason for this is that many organizations lack the right cloud infrastructure model to start doing so. They are locked in a world of legacy IT that is keeping their horizons and ambitions low.

Our research further found that 60% of businesses have a rigid IT infrastructure which is holding them back from innovating. A similar number said innovation is being hampered by the wrong approach being taken in enterprise cloud. A common thread for those who have had a mixed experience of cloud appears to be a lack of a unified approach. Deployments have been ad hoc and indicative of businesses not working together to implement a standard, enterprise-wide approach to cloud that delivers benefits at an infrastructure, platform and application layer.

62% *of businesses have implemented or plan to implement robotics.*

To date, many enterprise cloud models have consisted of little more than a loose collection of disparate cloud apps and storage, from a range of vendors. As a route to innovation, this approach just isn't adequate, and 62% of businesses said they need an integrated approach to cloud.

True enterprise cloud needs to be approached strategically to deliver a complete organization-wide platform for innovation that support the swift, seamless integration of new services and innovations.

Consider chatbot applications, which many companies are using to deliver information to customers in an automated and timely fashion. Such applications require access to relevant data from across an organization quickly and efficiently. However, companies are currently limited in how chatbots are used, and can't fully replicate a conversation with a human being.

By adopting an enterprise cloud strategy, chatbots can be transformed by new process management and connectivity between applications, making these more powerful for customer interactions. In addition, these more sophisticated interactions provide the opportunity to create and integrate better products and services.

If businesses fail to put in place the right foundations for building an innovative, 21st century business, they will encounter problems at every turn, exaggerated by their immobility, facing a risk of being left behind in the innovation slow lane that will inevitably lead to a dead end.

Our IT Infrastructure is too rigid and is holding back innovation

Total	UK	Germany	Nordics	Switzerland	France	Italy	Benelux	Spain	Poland	Turkey	South Africa	Gulf States
60%	51%	60%	61%	64%	53%	62%	54%	72%	63%	51%	69%	50%

Changing lanes

A Cloud Platform or platform as a service, enables all the different aspects of a cloud environment to work together, providing instant integration, removing the overheads in IT management that have for so long been counterproductive to innovation.

Cloud Platforms also enable business to embrace a fail-fast culture for innovation. An entrepreneurial attitude to risk and reward – of being prepared to try new things and move on quickly if they don't succeed – is essential in the digital world.

Equally important in the innovation story are Compute Services (also known as infrastructure as a service) – particularly when closely integrated with a Cloud Platform.

“ *If businesses fail to put the right foundations in place, they face the risk of being left behind in the innovation slow lane.* ”



As the underlying storage and compute foundation of cloud, Compute Services allow any workload to be moved to the cloud. This means organizations can use Cloud Platform tools to innovate and create new services using existing assets that were previously of limited use due to their location.

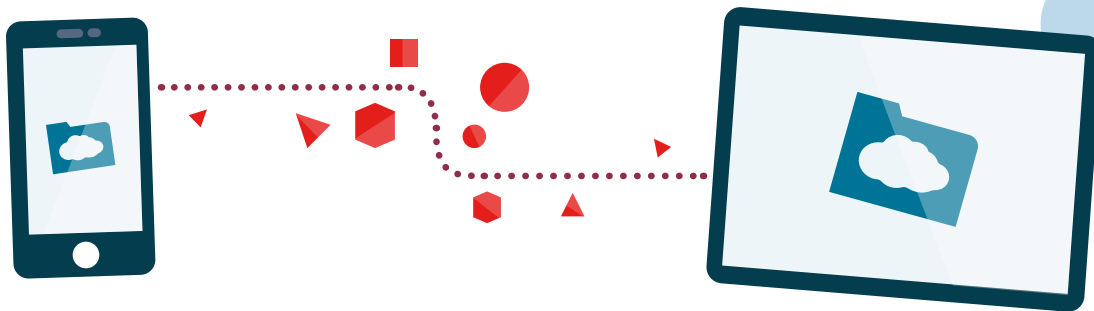
The other big benefit of an integrated approach is that Compute Services support elastic scaling or even 'hyperscaling' of new services that have been developed or enabled by Cloud Platform technology as usage and demand increases.

If a business has a game changing service or application on its hands, the opportunity to bring it to the market in a way that would be truly disruptive could be lost if the supporting infrastructure fails to cope with demand. The huge changes in how we consume movies, listen to music and order taxis would not have been possible without scalable cloud infrastructure.

60% *of businesses have implemented or plan to implement artificial intelligence*

The close integration of Cloud Platform and Compute Services – as exemplified by Oracle – means data can be easily moved between environments, depending on the business need, ensuring workloads can be updated and adjusted as new capabilities come on stream.

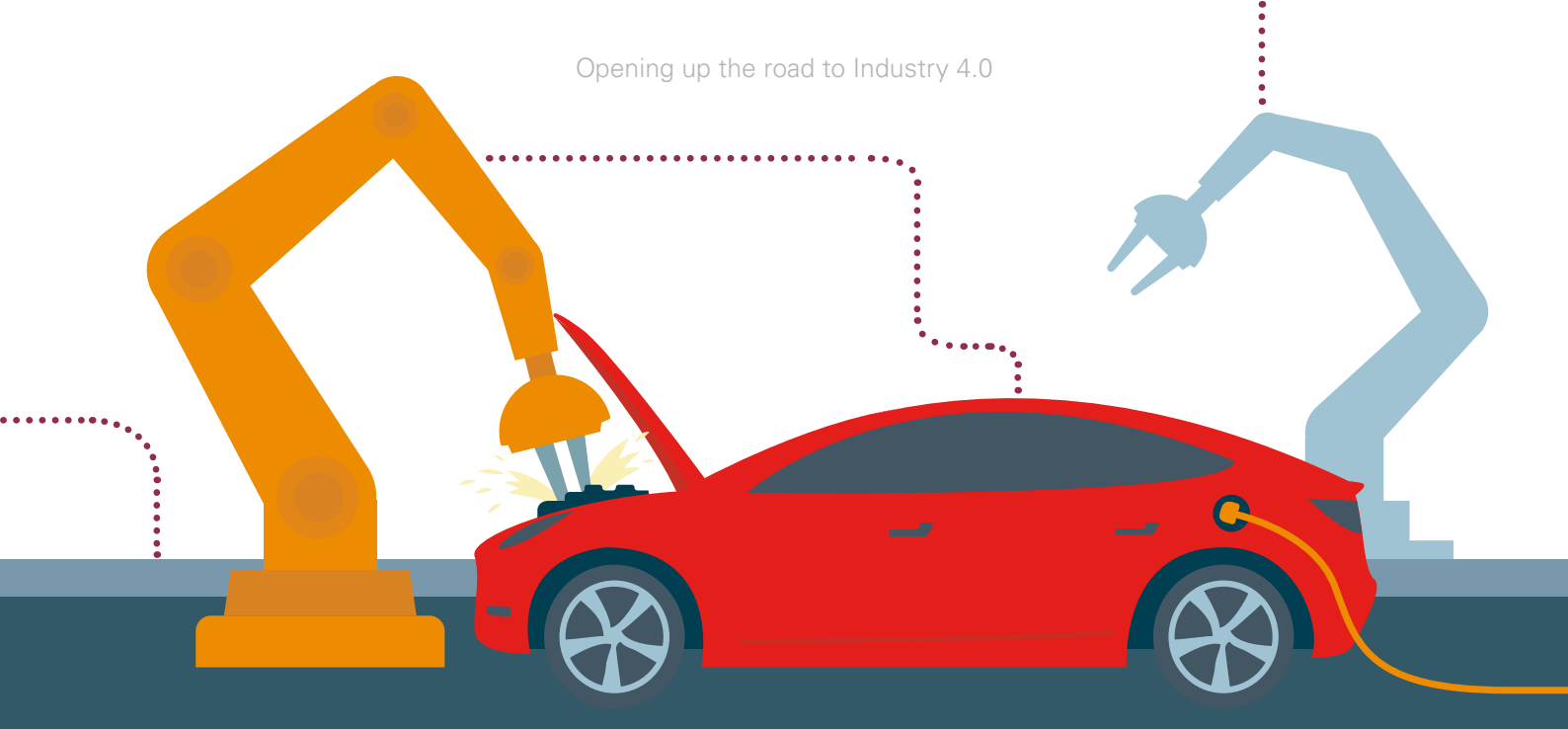
Only the integration of Cloud Platform and Compute Services can provide the blank canvas needed for the business innovation that is increasingly expected. There are countless services and products that have not yet been thought of, but integrated cloud services will undoubtedly be crucial in whatever emerges in the future.



Businesses must also embrace the greater collaboration afforded by cloud, across departments, businesses and geographies.

Encouragingly, Oracle's research found increasing collaboration across the business was a top three priority for CEOs in respect to IT for over a third of respondents (34%). The more easily a business can collaborate, the more likely it is to come up with truly innovative customer services and for those services to deliver benefit to each and every line of business. It's just as important that marketing and customer services are united and able to create, share and learn from common data, as it is for IT and finance, or HR and operations teams. Businesses that work together to deliver on agreed goals will succeed far more easily and quickly, and again cloud can bring consistency to these collaborative efforts.

Businesses may be concerned about how they transition to this world of integrated cloud. By working with integrated cloud providers such as Oracle, migration of workloads and processes from on-premise to cloud systems can be managed efficiently, meaning organizations can tap into the potential of cloud more easily than ever before.



Life in the innovation fast lane

By making use of closely integrated Compute Services and Cloud Platform tools, businesses will find they have the freedom and the confidence to explore the disruptive technologies that have the potential to transform their industry.

Insurance giant and Oracle customer AIG is already on that journey, with one example being its examination of how drones can be used to improve its services, using them during natural disasters to record footage and collect more information to feed into its claims handling processes, enabling it to settle claims more quickly and accurately.

In agriculture, Monsanto is also working with Oracle to push forward technologies such as sensors which can determine the ideal depth and most fertile location for sowing crops.

In other industries, such as manufacturing and automotive, robotics and artificial intelligence are changing everything from how products are assembled to how we drive our cars – or increasingly, how they drive for us.

IoT is changing entire industries such as shipping and logistics, removing manual processes as machine speaks to machine. Practical examples include advanced telemetry that enable retailers and manufacturers to track individual items in their supply chain and manage that chain and every process dependent upon it as efficiently as possible. Similarly, fleet management becomes far simpler if a business's systems are populated with live data from vehicles reporting on mileage, service needs and availability.

While these examples are very different, a common theme is that an integrated approach to cloud is at their core. In all cases, new types of data are gathered and processed using Compute Services, with Cloud Platform tools generating new insight and enabling innovative applications and services.

Keeping pace with innovation

With cloud accelerating innovation and automation becoming more widespread, there will be shifts in entire industries, meaning new types of jobs and work will emerge. This will require workers to quickly develop new skills as their roles evolve.

But the tools and capabilities that Cloud Platforms provide will be able to support these necessary changes in skillsets, which means employees won't need to be reskilled from the ground-up.

60%

of businesses say a rigid IT infrastructure is holding back innovation



The increasing use of big data and analytics for instance, will present a challenge to many people. But Cloud Platforms enable businesses to develop applications which deliver information, knowledge and insight in ways that are relevant to its needs. Visualizations can be easily achieved on a tablet or smartphone and information will be accessible from anywhere, and delivered in near real-time.

Cloud technology democratizes access to these kinds of capabilities, meaning employees of companies that take an integrated approach cloud won't be left behind and can play an active role in the innovation that needs to take place.

And thanks to the centralised way in which cloud systems are updated, new tools will be regularly added, ensuring users can gradually build up the skills to perform new tasks. Previously, system upgrades would take place every few years, with users taking time to get to grips with them. With the constant upgrades that cloud enables, users will be constantly learning as they go.

The time is now

Whatever industry they are in, successful business of the future will have an integrated enterprise cloud model. This is a fact already acknowledged by 63% of businesses we surveyed.

The fact many organizations are already exploiting the power and flexibility of cloud infrastructure and platform to drive the next wave of innovation, which means there is no time to wait for businesses playing catch-up.

Those already using the cloud to make quantum leaps in how they operate will find efficiencies in how they deliver a truly modern customer experience. But not all is lost for businesses that haven't done so. Although only 8% of respondents said they already have an integrated cloud model in place, 36% expect to have one in place this year, suggesting businesses are going to start shifting lanes very quickly.

Companies must quickly make the shift to implementing an integrated cloud model. If they don't, they will be living on borrowed time, waiting to reach that inevitable dead end in the innovation slow lane.

“ *Only the integration of Cloud Platform and Compute Services can provide the blank canvas needed for innovation.* ”





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