

How APIs help make application integration intelligent

Artificial intelligence (AI) represents a technology paradigm shift, with the potential to completely revolutionise the way people work over the next few years. Application programming interfaces (APIs) are crucially important in enabling the rapid development of these AI applications. Conversely AI is also being used to validate APIs, themselves, and also to analyse and optimise their performance.

Wikipedia defines an API as a ‘set of subroutine definitions, protocols and tools for building application software’. In slightly less dry terms, an API is basically a gateway to the core capabilities of an application, enabling that functionality to be built into other software. So, for example, if you were creating an app that needed to show geographic location, you might choose to implement Google Maps’ API. It’s obviously much easier, faster and future-proof to do that than to build your own mapping application from scratch.

How APIs are used in AI

And that’s the key strength of API—it’s a hugely efficient way of enabling networked systems to communicate and draw on each other’s functionality, offering major benefits for creating AI applications.

Artificially intelligent machine ‘skills’ are, of course, just applications that can be provided as APIs. So if you ask your voice-activated smart device—whether it’s Siri, Cortana, Google Assistant, or any of the rest—what time you can get to the Town Hall via bus, its response will depend on various skills that might include:

- Awareness of where you are—from a geo-location API
- Knowledge of bus routes and service delays in your area—from a publicly available bus company API
- Tracking of general traffic and passenger levels—from APIs that show user locations provided by mobile device manufacturers
- Being able to find the town hall—from a mapping API

None of these APIs needs to know anything about the others. They simply take information in a pre-defined format and output data in their own way. The AI application, itself, has to understand each API’s data parameters, tie all their skills together, apply the intelligence and then process the data.

Everything is possible

That means you can combine the seemingly infinite number of APIs that exist in any way you like, giving you the power to produce highly advanced applications—and create unique sources of value for your business. You could potentially build apps to enhance the customer experience, improve your internal processes, and analyse data more effectively to strengthen decision making—and perhaps even identify whole new areas of business to get into.

How AI is being used to improve APIs

APIs are the ideal way of getting information into AI applications and also helping to streamline analytics—yet artificial intelligence also has a vital role to play within API development itself. For example, AI can be used to automatically create, validate and maintain API software development kits (implementations of APIs in multiple different programming languages).

AI can also be used to monitor API traffic. By analysing calls to APIs using intelligent algorithms, you can identify problems and trends, potentially helping you tailor and improve the APIs over time. Indeed, AI can be used to analyse internal company system APIs, for example, helping you score sales leads, predict customer behaviour, optimise elements of your supply chain, and much more.

Get the complete picture

To learn more about how you can build powerful applications with the potential to change how you work—using APIs and other forms of integration—join us for our upcoming live webcast on gaining a 360-degree view of your business.

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Quantum computing

The quantum world is weird! Pioneering Danish physicist Niels Bohr famously said that anyone who is not shocked by quantum theory has not understood it. But it's amazing too—the world of sub-atomic matter is truly fascinating and challenging to understand.

Two states at once

Consider this example: sub-atomic particles (think of them simply as tiny, floating ball-bearings for the purposes of this discussion) have a quality known as “spin”. It's not that they're actually even spinning, and—indeed—it's not clear that would mean anything at this level, but they behave as if they are. When two are created simultaneously, each one's direction of spin has to cancel the other one's out: each doing the opposite of its partner. Why? Well, that's beyond the scope of this blog, so please just trust me on that.

Due to the unpredictability of quantum behaviour, it is impossible to say in advance which will go clockwise and which anticlockwise. More than that, until the spin of one is observed, they are both doing both. Yes, that's right: both clockwise and anticlockwise simultaneously! But it gets weirder still.

When you observe one—and see that it is going clockwise or anticlockwise—the other one will be doing the opposite, wherever it is in the universe. And the act of observing one defines—retrospectively—what the other will be doing, even if they're at opposite ends of the cosmos.

The future is quantum

Confused? You're not alone. And why does any of this matter? Well, these might seem like daunting concepts—and this is actually about the simplest example I could use to provide adequate insight—but quantum theory could have a massive impact on computing and communications in the coming years.

Instead of binary transactions representing ones and zeroes, quantum computers are based on qubits. Like the spinning sub-atomic particles above, these qubits can be in both states at once—so a one and a zero simultaneously. That property opens up a world of potential. It means that quantum computers could be a whole lot faster at performing some tasks than traditional computers. And not just tens of times faster—potentially hundreds of thousands of times faster! Indeed, Quantum computers might be able to efficiently solve problems that binary computers would never be able to solve (...at least, not within any practical time period).

Complex applications

The implications are huge, especially for processing enormous numbers. Key applications will be financial analysis and machine learning; optimization of mathematical problems, and pattern recognition and anomaly detection. Optimization involves finding the solution to mathematical conundrums with lots of constraints—like the best path among many possible

routes to a destination, the right place to drill for oil, or the most efficient moves for a manufacturing robot.

Another specialist area will be cryptanalysis (i.e. code-breaking to me and you). Where it's been estimated that an average computer would take more than 14 billion years to crack standard secure sockets layer (SSL) 2,048-bit encryption, for example, a quantum computer could crack it in seconds.

"But that's a bad thing", I hear you exclaim. And yes, without quantum encryption it would be. But here's where things get weird again. The traditional key exchange problem of binary encryption is overcome in quantum computing by the fact that the very act of reading encoded data changes its state—effectively destroying it for the would-be intruder. So quantum encryption should take security to its ultimate conclusion.

The future's now...

So how distant are quantum computers from today's reality? Well, as with a great many technology-related pies, Google has a finger in this one, and owns D-Wave—which produces what it claims is the most advanced quantum computer in the world: the D-Wave 2XTM System. Developed with NASA, and priced at a cool \$10m, it boasts a 1,000-qubit processor, operating at -270oC (which is 180 times colder than interstellar space, boasts the website), in a vacuum that's 10 billion times lower than atmospheric pressure, and shielded against the earth's magnetic field by a factor of 50,000.

...and the future is also not now

Yet, in fact, not even the people who built the D-Wave machine are entirely sure if it's actually a quantum computer at all or just a very quirky classical one. And they're still working on understanding what exactly it can do. There are all kinds of problems, not least the fact that even when you successfully run a calculation, it's difficult to find the answer because looking at it (called "decoherence" with no hint of irony) can easily collapse your quantum calculation into garbage.

So not yet smartphone ready...

Of course, where there is a strong will, the way is usually found quickly when it comes to technology. So, while it may still be some time before your smartphone boasts a super-cool quantum processor, the future is exciting—and also truly fascinating and confusing!

Smarter than automation—think autonomy

How many of us today can imagine the world before mechanical automation? Yet, who can clearly visualise the new age of autonomous technology, propelling itself towards us ever faster? Auto-replenishing refrigerators, human-sounding medical diagnosis bots, unmanned drone-taxis, smart factories—and all manner of other advances—will be part of everyday life before we know it. As we consider the potential of using such technology to innovate in new ways, let's consider how far we've come with automation.

Take driverless vehicles—they're actually not so new. Indeed, aircraft autopilot systems have been in widespread use for decades and free up their pilot supervisors to concentrate on other tasks. Similarly, automated manufacturing lines and mechanical robotics have dramatically improved production quality, and—crucially—sped up product innovation.

Man versus the future

In both these examples of automation, it's the mix of man and machine that's key. The machine does the routine, consistent, ever-vigilant tasks, while humans are freed up to take on the creative work or responsibility.

According to PwC*, this will continue to be the case with AI and autonomous technology. For example, most people have heard how AI has beaten a chess grandmaster. But perhaps fewer know that a human working in partnership with an autonomous player—a so-called 'centaur'—can usually beat AI. Again, the mix of man and machine trumps the machine alone.

For people worried about their future that's good news. Just as with automation, PwC says autonomy will encourage a gradual evolution in the job market that will be net positive. New kinds of jobs will offset the ones that are lost. You'll still work, but far more efficiently with the help of AI.

Time to get smarter

Similarly, in IT, autonomy will help people work smarter. Oracle's software is leading the way and already delivers far-reaching benefits that can help you to innovate in completely new ways. This self-driving, self-patching, self-repairing and even self-designing technology means reduced man hours, fewer errors, increased uptime, enhanced performance and constant access to the latest technology updates.

And there's even more benefits for line-of-business users—self-repairing production lines, finance process automation, intelligent candidate screening in HR, new insights from advanced analytics that can dig deeper into data than ever—the list goes on. Product innovation can look much further ahead, with clearer insights on customer needs, and harnessing the latest technology—all thanks to smarter thinking by man and machine.

Wizard technology

Complex IT tasks can be made much easier, faster and more accurate. Consider integrating applications and processes, for example—the latest software can provide machine-learned ‘best next action’ recommendations to eliminate human errors in complex data mapping. Machine learning can also suggest the best user selections for process flows, while AI can drive the generation of integration flows by mining the successful execution of thousands of integrations at runtime. The latest autonomous software can also sense and raise alerts for application integration connectivity issues, and also notify when data storage thresholds are exceeded.

Be first to innovate

So how does all this apply to you? How ready are you to innovate and deliver the next generation of intelligent software? Your business objectives will have a major bearing on what capabilities are most important, and how you use autonomous technology to get closer to your customers to better understand their needs.

Join our webcast to discover how online personal clothes-shopping business, TrunkClub, has employed innovative API integration to get closer to its customers online.

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* '2018 AI predictions—8 insights to shape business strategy', PwC, 2018

[\[https://www.pwc.lu/en/digital-services/docs/pwc-ai-predictions-2018-report.pdf\]](https://www.pwc.lu/en/digital-services/docs/pwc-ai-predictions-2018-report.pdf)

Smarter insights: how next generation AI can help you see things differently

Welcome to the era of intelligent, self-driving software. Just as self-driving vehicles are set to transform motoring, self-driving software promises to transform our productivity, and strengthen our analytical abilities.

Perhaps you drive an automatic car today—how much are you looking forward to the day your car will automatically drive you? And how much more preferable would smoother, less time-consuming journeys be—always via the best route, with fewer hold-ups, and automatically avoiding unexpected road congestion—where you only have to input your destination? The technology is almost here, and similar advances are driving modern business applications.

AI and machine learning are finally coming of age thanks to the recent advances in big data that created—for the first time—data sets that were large enough for computers to draw inferences and learn from. That, along with years of SaaS application development in cloud computing environments, means that autonomous technology—harnessing both AI and business intelligence—is now fuelling self-driving software... for both cars and cloud applications.

Autonomy—beyond automation

Automation has, of course, been around for years. But autonomy—running on AI and machine learning—takes it to new levels. Today's software is truly self-driving—it eliminates the need for humans to provision, secure, monitor, back-up, recover, troubleshoot or tune. It upgrades and patches itself, and automatically applies security updates, all while running normally. Indeed, an autonomous data warehouse, for example, can reduce administration overheads by up to 80%.

Intelligent thinking

But the greatest value is perhaps in what AI enables you to discover from your data. When applied to analytics, it can identify patterns in huge data sets that might otherwise go unnoticed. So, for example, you could apply AI to sales data to identify trends—who bought what, where, when and why?—and apply those to improve the accuracy of your future forecasts.

Alternatively, if you were looking for a vibrant location for new business premises, you might use AI to search for an area with a strong social media buzz around its restaurants and bars. You could teach the software to look for specific words or phrases, and harness machine learning to improve results over time.

AI technology is already widely used in HR to take the slog out of sifting through huge numbers of job applications. As well as being faster and requiring less manpower, it's able to remove both human bias—critical in the highly subjective area of recruitment—and also identify the best candidates based on factors such as the kind of language they use.

Knowledge and power for everyone

These technologies are coming on line now—today—for everyone. In the past, most database reporting was typically run by data scientists to update pre-existing dashboards and reports. Nowadays there are many more business users who are demanding access to such insights, which is being made possible by tools that are far easier to use.

Anyone can experiment with large samples of different data sets, combining multiple data formats—structured and unstructured—and discovering new trends. They can get answers in context, at the right time, and convert them into simple-to-understand insights, enabling decisions to be made more quickly for competitive advantages.

Smarter and smarter...

Yet it's the strength of those insights that's really compelling. As one commentator observed: 'Machine intelligence can give you answers to questions that you haven't even thought of.' The quality of those answers—and their underlying questions—will only improve over time. That's why it's becoming a competitive imperative to embrace the power of intelligent analytics to ensure you can keep pace with market leaders.

Discover how...

So why not see how easy and fast it can be to gain new insights from your existing data, using the latest in autonomous analytics technology. Join us for our upcoming live webcast and learn how to create a self-driving cloud resource that's optimised for your exact needs.

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Create new value in your supply chain

Industry 4.0 technologies are enabling organisations to innovate across their production and supply chains like never before. But the risks associated with implementing new technology means projects are often limited in scope to help ensure positive returns on investment. So how do you unleash the full value available by taking a single, holistic, end-to-end approach to innovation across your entire supply chain? Indeed, how can you put a figure on the potential ROI from doing that—one that you can weigh against the potential risks? There is now a powerful online tool that can help you do exactly that based on your own specific business circumstances.

Technologies such as artificial intelligence, the internet of things and Robotic Process Automation, among others, are ushering in a new era of product development and manufacturing. New capabilities—made possible through connecting your supply chain operations, functions, devices and data in the cloud—are enabling businesses to innovate in completely new ways.

Indeed, the modern digital supply chain now starts in product design. It includes all your raw-materials' suppliers and stretches through each of your in-house production processes. It also includes your sales channels and distribution network, reaching through to post-sales support to finally capture customer feedback—which can then be fed back to inform product design in an infinite development loop. By creating a digital framework—to view these elements as part of a single ecosystem—you can create powerful new economies across existing operations, and also identify new ways to innovate.

How can your business benefit?

You can now put a figure on how much value you can create for your business by using a helpful online tool. Simply enter a few details about your business to get started—annual revenue, industry and number of employees—and discover the potential opportunity overall, along with a detailed, personalised breakdown of how you can:

- Cut back on the costs of supply chain operations
- Minimise maverick spend
- Reduce operations costs for logistics
- Increase operating profit via improved product lifecycle management
- Optimise inventory carrying cost

Get the full picture

In each of these five areas, you can also gain access to a wide range of supporting content—videos, customer success stories, blogs, eBooks and more—to help you see how you can drive maximum success. Your personalised report will summarise the findings of the tool, with links to yet further resources, for use in your business cases. Because, while 67% of UK manufacturers recognise Industry 4.0 as an opportunity, only 25% feel they have an adequate understanding of its issues, implications, threats and opportunities*—this is your opportunity to join that group.

Now is the time to deliver

Now is the time to act in adopting an Industry 4.0 approach to your supply chain. We are at a watershed moment where those businesses that are first to drive economies and identify new opportunities in their business processes will enjoy considerable competitive advantages over those that follow. Moreover, as well as the cost benefits, the first movers will also get a head start on how to innovate within their supply chains, enabling them to deliver successive waves of value faster.

* “Annual Manufacturing Report 2017”, The Manufacturer and Hennik Research, 2017
[<https://www.themanufacturer.com/wp-content/uploads/2017/01/Annual-Manufacturing-Report-2017.pdf>]

Achieving the best results with collaboration—recognizing that culture is key

I had the pleasure of being shown around a client's office and production plant last week—a leading manufacturer in the ultra-competitive food and beverages industry—and was really struck by how well they are using collaboration tools to get the best results.

There's been a load of talk about collaboration in recent years, and scores of providers claiming that their product or solution will help you achieve new heights in productivity. You're probably well aware of these—everything from simple cloud storage utilities to social networking tools, to the increasing number of capabilities that are included in the full-on enterprise resource planning (ERP) solutions that form the operational backbone of many global enterprises. At every level, these are generally great solutions, and full of potential.

Conflicting success factors

But back to the client—the food and beverages industry is, arguably, one of the most innovative there is. Not only do they have to constantly come up with new products to respond to changing customer tastes and keep up with competitive pressures, but they're also subject to major product safety and compliance challenges, which evolve all the time. Success depends both on being super-agile and yet also somehow delivering strong economies of scale—two apparently competing goals.

Launching new products, coordinating customer service, delivering promotional campaigns, conducting market research, running detailed analytics, operating complicated supply chains, managing projects across different geographic areas—and a host of other complex, cross-functional tasks—all have to be achieved on a regular basis, under the tightest of time pressures and without any slip-ups.

Collaboration backbone

Like virtually every large organization these days, the company I visited has deployed ERP as the foundation of its collaboration backbone. Theirs is a relatively new, cloud-based solution, so can be accessed from anywhere, is relatively simple to administer, and gives them great flexibility to scale—both to enter new geographic markets, and also to create temporary teams focused on new product launches.

They run their whole business through this platform—every piece of data at every stage of production, every project, and every plan is channelled through it—and it appears to be a highly successful, textbook implementation. Partners are also able to gain access too, which delivers all kinds of benefits, from faster response times to operating efficiencies, and improved quality control.

Yet, while the ERP solution is the technology centrepiece of their operations, there's free rein for anyone to use almost any tool they wish. And this is where the story gets really interesting.

Fostering a collaboration culture

So strong are their competitive pressures, and so important is business agility to this organization, that they have taken a strategic decision to actively promote effective collaboration as a cultural objective. Where technology is recognized as the vehicle, it's seen as no more than that—and people's behaviour is considered to be the key enabler of productivity and competitive edge. Everyone is encouraged to seek out better ways of working using any technologies that help them deliver improved outcomes. The rule of thumb appears to be: if it gets results, anything goes.

That's not to say there's no rules—quite the contrary. There's complete top-down awareness of the importance of the ERP platform and a company-wide commitment to it. There are also sensible security policies in place to protect data. But there's a family of approved, cloud-based tools that are installed on company devices and widely used across the organization. Online training tutorials are available for all of these, and people are encouraged to spend time both familiarizing themselves with those, and also looking for new and better ways of doing things.

The best results

That's provoked an explosion in individual innovation, which has improved both productivity and morale. People are working exactly as they choose to—whatever the device or location—and coming up with new ideas for how to achieve the best results. Core company data is available from the central ERP solution, but can be accessed, used and communicated through a wide range of additional cloud-based tools.

Open communication channels

Applications such as instant messaging—with real-time presence information and video conferencing capabilities—have become commonplace. Large files are shared among people who are looking at the same core systems from across different continents. Moreover, people now expect almost no latency in their communications, making adequate bandwidth a key component of these tools.

Whatever tools you use, my client visit has shown that promoting a culture of collaboration is essential for unlocking the best outcomes from your technology infrastructure.

HR today: right skills, right place, right time, right price

The only constant in today's work environment is change. If you're going to grow and stay competitive in this era of digital transformation, your business has to keep up—and HR must too.

A wide range of factors all mean that HR constantly has to grow and transform—changing demographics, new business models, economic uncertainty, evolving employee expectations, the bring-your-own-device revolution, increased automation, AI, the relentless search for cost savings, and more.

Things are different today. In the past, business change processes typically had a start and target end date, with specific deliverables that were defined in advance. Now change is open-ended, and its objectives evolve over time—based on the world as it is, rather than a set of assumptions. An agile model for transformation is therefore essential, along with a decision-making process that can survive constant change.

The fact is that people are still—and will always be—the most important part of any business, so HR has to be closely aligned to your overall business goals, delivering benefits to the whole organisation. Every move your HR team makes should be focused on how to deliver the right skills in the right place, at the right time and at the right price, to achieve your business's goals.

Workforce planning

To manage your workforce effectively as the needs of your business change, you need to know what talent you have, where it's located—and also what skills you are likely to need in the future. It's much easier to fill skills gaps when you can see, or anticipate, them.

Deliver maximum value from your own people

And it's much easier to do if you've already nurtured a culture of personal improvement. Giving people new opportunities to learn and develop, and a sense of control over their own careers will help you maintain up-to-date skills within your business and also identify the most ideal candidates—whether for promotion, relocation within the company or to take on specific roles. Moreover, it should enable them to, for example, pursue areas of personal interest, train for qualifications, or perhaps work flexibly—all of which will improve loyalty and morale.

You can also look for skills gaps that you absolutely must recruit externally to fill, and understand how best to do that, especially at short notice. What are the most cost-efficient and effective channels, for example? You might consider whether offshoring for skills is helpful, or maintaining a base of experienced temporary workers that you can call on.

Unknown unknowns

Yet these are all known gaps. Organisations now also have to consider recruiting people for unknown jobs too. Some estimates suggest that as much as two-thirds of primary school children will end up working in jobs that don't yet exist. So what new roles are being created in your industry, and how are you selecting people that will be able to grow into them?

Maximise the value of your HR function

Your HR organisation must be capable of, and ready to support these changes, and that means three things. First, the strategic workforce planning activities described above, supported by modern data and analytics. Next, HR has to provide the very best employee experience possible, enabling personal development and support. Finally, they need to be able to support the process of constant change itself, and move to a more agile way of operating.

Get the culture right

Creating and nurturing a strong culture is essential here, and that relies on close co-ordination between HR, line managers and employees. Having a core system of record on everyone's roles and various skills supports all these objectives, and can help you to grow your business through the modern era of change.

Performance Management in Workplace 2.0

Businesses are realising that in order to grow, they need to put their employees first. Performance management has been placed under the spotlight, with traditional strategies proving to be rigid, slow, and unsuitable for modern businesses. In the era of Workplace 2.0, a new kind of performance management is needed.

Smart companies are embracing the new technologies available to them, using a data-led approach to optimise work conditions and maximise employee engagement. Through a tailored, employee-centric performance management strategy, the individual needs of each employee can be met, enabling high performers to deliver, and turning laggards into more effective employees.

Always-on performance management

Employee expectations have never been higher. Thanks to shifting sentiment about the nature of work and a tight labour market, it's no longer enough for employees to simply deliver for their businesses. In order to grow, businesses need to deliver for employees. With this in mind, performance management needs to shift from a compliance mindset that concentrates on rooting out underperformers, and instead focus on supporting and developing employees.

One way to do this is to reassess the role of appraisals. In an age of personalisation and digital transformation, the traditional annual appraisal model looks increasingly outdated. In fact, in a survey done by the Chartered Institute of Personnel and Development (CIPD), it was found 73% of senior non-HR leaders thought annual appraisals were ineffective.

Rather than subscribing to the annual appraisal ritual, businesses need to enable employee growth throughout the whole year, encouraging constant support and feedback, and forming developmental strategies tailored to the needs of individual members of staff.

Combining data with behaviour

Relying purely on sales targets and other metrics to assess performance will never give the full performance picture. Setting goals is still vital, but business growth means broader organisational objectives need to come first, after which they can be cascaded down to employees to help inform their personal objectives.

Employees need to be given a sense of purpose and a clear roadmap for development—that's revisited regularly—and with recognised support resources that support their strengths and enrich their lives. This is a major move on from the traditional pay check-focused employee, who took their lead from their boss and whose only formal personal development opportunities were formulated during their once-only annual review.

Indeed as automation creeps into many process-driven and transactional jobs, employees' roles are becoming more complex. An altogether more holistic approach to measurement needs to be taken, focusing less on outputs, and more on behaviours. Behaviours such as

employee engagement—a trait which is becoming recognised as key for growth. In fact, companies with an engaged culture have been found to have a 65% higher share price and 26% less employee turnover.

By combining smart measurements with strategies to encourage the desired values and behaviours, businesses can create a stronger, more motivated workforce.

A smart approach to compensation

In its 2017 Global Talent Trends study, Mercer found that compensation was the number one motivator for employees. However, in order for compensation to achieve maximum effectiveness, businesses need a smarter approach. Linking pay to broad performance targets risks creating incentives for employees that are unrelated to organisational goals, and so limits business growth.

Instead, businesses should be channelling compensation to places that need it, such as talent acquisition, or areas of high staff turnover. Pay should also be incremental, responding to the needs of individual employees, rather than a one-size-fits-all approach.

The future of performance management

The year of the employee is not about handing unaccountable power to employees, but rather about finding ways to manage their performance and maximise their engagement. By combining smarter measurement with individually optimised performance management, employers will get the opportunity to develop and grow—both their employees, and their business.

Cloud: Look before you leap—and discover unbelievable new agility

All around the world, finance teams are now fully embracing the cloud to simplify their operations. The heady allure of reduced costs, increased functionality and other benefits is driving the migration. Yet what's getting people really excited is the unexpected flush of new business agility they experience after they've made the change.

At long last, the cloud is becoming accepted as the default environment to simplify ERP and EPM. Fifty-six percent* of finance teams have already moved to the cloud—or will do so within the next year—and 24% more plan to move at some point soon.

Major cost benefits in the cloud

Businesses are making the change to enjoy a wide range of benefits. According to recent research*, reducing costs is (predictably) the main motivation, with improved functionality in second place—and culture, timing and the ability to write-off existing investments also key factors. The financial motivation breaks down into a desire to avoid infrastructure investment and on-premises upgrades, and also to achieve a lower total cost of ownership.

And cloud is delivering on its promise in all these areas—across both ERP and EPM, 70% say they have experienced economic benefits after moving to the cloud.

Leap for joy at cloud agility

But the biggest overall benefit of moving to the cloud—quoted by 85% of those who have made the change—is staying current on technology. Moreover, 75% say that cloud improves usability, 71% say it increases flexibility and 68% say that it enables them to deploy faster. Financial gain is the top motivation for moving to the cloud, but that's only the fourth-ranked advantage overall once there. It turns out that the main strengths of the cloud are in areas that help finance organisations improve business agility.

These are pretty amazing numbers. It would be unheard of, until fairly recently, for any decent-sized organisation to consider migrating its core ERP or EPM systems without a very, very good reason. Now, the majority of companies believe that the advantages of such a move—and specifically, moving to the cloud—overwhelm any downside.

The commercial imperative

Indeed, the benefits are more likely viewed as a competitive necessity. Cloud eliminates the old cycle of new system launches every two or three years—replacing it with incremental upgrades several times each year, and easy, instant access to additional features and capabilities.

And that is, no doubt, what's behind the figures above. Finance professionals have an increasingly strong appetite to experiment with and exploit the latest technologies. AI, robotic process automation, internet of things, intelligent bots, augmented reality and blockchain are all being evaluated and used by significant numbers of organisations.

They're improving efficiency in their day-to-day operations, joining-up operating processes across their business and reducing manual effort (and human error) through increased automation. Moreover, AI is increasingly being applied to analytics to find answers to compelling new questions that were, themselves, previously unthinkable—providing powerful new strategic insights.

Finance organisations are becoming more agile—able to think smarter, work more flexibly, and act faster using the very latest technical capabilities.

But it's only available via cloud-based ERP and EPM

Increasingly, all these advances are only being developed as part of cloud-based platforms. And more and more advanced features are filtering down to entry-level cloud solutions—at least in basic form—encouraging finance people everywhere to experiment with what's possible. That means, if you're not yet using these tools in the cloud, you're most likely falling behind your competitors that are—and that applies both from the broader business perspective as well as from the internal operating competency viewpoint.

The cloud makes it simple to deploy, integrate and experiment with new capabilities, alongside whatever you may already have in place. It has become the new normal in finance. It seems like we're now at a watershed moment where those that embrace the potential of cloud will accelerate away from those that do not, and potentially achieve unassailable new operating efficiencies.

The good news is that it's easy to get started. According to MIT Technology Review in a 2017 report, 86% of those making a transition to the cloud said the costs were in line with, or better than expected, and 87% said that the timeframe of transition to the cloud was in line with, or better than expected.

* Except where stated otherwise, all figures in this article are taken from 'Combined ERP and EPM Cloud Trends for 2018'.

Want to grow faster? Employ HCM cloud

The value of human capital management (HCM) software to HR teams is well understood. But exactly how much can your organisation benefit from HCM software as it strives to grow in today's competitive markets? It can be challenging to understand the value of new processes or state-of-the-art capabilities—such as the latest artificial intelligence (AI)—especially if you don't yet have any experience of them. Fortunately, there is a useful online tool that will help you get to grips with both what you can achieve, and also how much the new capabilities are worth to your business specifically.

Effective, modern HR systems can save your business time and money in countless ways. For example, in the recruit to onboard phase, they can help you identify current skills gaps. When combined with an appropriate model for how your business is likely to grow they can even forecast the skills you will need for the future. Automation can be used to filter large numbers of applications and CVs quickly, and AI used to identify specific candidate attributes—perhaps using intelligent bots—or to search through previous applications. A single, common platform can help make offer generation easier, and improve the employee experience during onboarding. That same platform can make HR's job far easier, helping to grow productivity, and also meeting other goals such as compliance.

How much can you gain?

In fact, these are just a few of the headline benefits of the latest HR systems, and focused on one area, for recruit to onboard. But what are modern HR systems actually worth to your organisation in practice, in your particular market and operational circumstances?

There is a powerful, quick and easy-to-use online tool for recruit to onboard that will create a personalised report for your specific business requirements. Simply enter a few details about your business to get started—annual revenue, industry and number of employees—and you will gain access to a detailed analysis of how you can save over five key areas:

- Reduce voluntary employee turnover
- Optimise employee replacement expense
- Speed up time to hire
- Minimise outside recruiting costs
- Increase percentage of right hires

Best practice advice

The tool puts a figure on the overall savings you can make, as well as providing estimates for how that breaks down across each of these five areas. Moreover, there is a wide range of supporting content—eBooks, videos, blogs, customer success stories and more—within each section to help you visualise best practice to grow your business. Finally, your personalised report will summarise the online tool's findings, with links to further resources, for use in your business cases.

When used correctly, effective digital HCM experiences have been shown to drive positive changes in areas that impact employee engagement. Forty percent of employees believe

their organisations promote flexible working and 38% believe their employer is concerned with their wellbeing—both of these statistics could potentially be improved upon with effective cloud-based HCM software.

The number's up on delays

Using our online tool, you will—perhaps for the first time—be able to understand exactly what your business specifically can gain from updating its recruit to onboard systems and processes. HR technology is currently advancing at a faster rate than ever and successfully recruiting the best talent has become a competitive necessity. There is a danger that those companies that do not embrace the new ways of working will be left behind—both in their industry sector, and also in their very ability to find and retain the best people in the future.

Essential enablers for implementing a modern product strategy

Continuous improvement across your entire mix of products and services is essential to innovate and stay competitive nowadays. Digital disruption requires companies to transform, successfully manage a portfolio of profitable offerings, and deliver unprecedented levels of innovation and quality. But creating your product portfolio strategy is only the first part—four key best practices are necessary to successfully implement it.

New technologies—the Internet of Things (IoT), Big Data, Social Media, 3D printing, and digital collaboration and modelling tools—are creating powerful opportunities to innovate. Increasingly customer-centric propositions are being delivered ‘as-a-service’ via the cloud, with just-in-time fulfilment joining up multiple parts of the supply chain. Your products and services have to evolve continually to keep up, causing massive amounts of data to be generated that has to be fed back in to inform future development.

Common language

To minimise complexity, it’s essential that there is just one context for all communication. You therefore need a standardised—and well-understood—enterprise product record that acts as a common denominator for your business processes. And that means every last piece of information—from core service features to how your product uses IoT sensors; from business processes to your roadmap for innovation, and all other details—gets recorded in one place, in the same way, for every one of your products, from innovation through development to commercialisation.

That will make it far easier for you to collect and interpret product information; define service levels and deliver on them; support new business models, and manage the overall future design of your connected offerings. Moreover, it enables your product development methods to become more flexible, so they can be updated more frequently, enabled by innovations in your supply chain, supported more effectively by IT, and improved over time.

Greater quality control in the digital world...

By including form, fit and function rules—that describe the characteristics of your product, or part of it—within the product record, you add a vital layer of change control. It enables you to create a formal approvals process for quality assurance. For example, changes made in one area—whether to a product or part of it—may create problems in other areas. The form, fit and function rules force you to perform cross-functional impact analyses and ensure you’re aware of any consequences.

As part of this, you can run simulations with ‘digital twins’ to predict changes in performance and product behaviour before anything goes wrong. This obviously has major cost-saving implications, enabling far more to be understood at the drawing-board stage. Moreover, IoT applications can be leveraged to help product teams test and gather data of your connected assets or production facilities.

Transparency and effective communications

The enterprise product record should also contain a full audit trail of decisions about the product, including data from third parties, and from your supply chain. The objective is full traceability from the customer perspective—with evidence of regulatory compliance, provenance of preferred suppliers, and fully-auditable internal quality processes. Additionally, it's often helpful to be able to prove the safety and quality of your product and processes, as that can be a key market differentiator. Powerful project management and social networking capabilities support the collaborative nature of the innovation process.

Lean and efficient

Overall, your innovation platform should be both lean and efficient, based on the continual iteration of the following key stages:

- **Ideation**, where you capture, collaborate and analyse ideas
- **Proposal**, where you create business cases and model potential features
- **Requirements**, where you evaluate, collaborate and manage product needs
- **Concepts**, where you accelerate product development and define structures
- **Portfolio analysis**, where you revise and optimise your product investment
- **Seamless Integration** with downstream ERP and Supply Chain processes

The result: Powerful ROI

Being able to innovate effectively in a digital supply chain delivers returns from both top-line growth—with increased revenues and market share—and reduced costs from improved safety, security, sustainability and fewer returns.

You've got to start with the customer experience

Visionary business leader Steve Jobs once remarked: 'You've got to start with the customer experience and work backwards to the technology.' From someone who spent his life creating definitive customer experiences in technology itself, these words should carry some weight—and are as true today as ever.

The fact is that customer experience is a science, and relevance is its key goal. A powerful customer experience is essential to compete today. And relevance is what cuts through the noise of the market to actually make the connection with customers.

The fundamentals of success

For companies to transform their customer experience, they need to be able to streamline their processes and create innovative customer experiences. They also have to be able to deliver by connecting all their internal teams together so they always speak with one consistent voice.

But that's only part of the story. Customers have real choice today. They're inundated with similar messages to yours and are becoming increasingly discerning in their tastes.

Making yourself relevant depends on the strength of your offering and content, and the effectiveness of your audience targeting. It also depends on your technical capabilities. Many of your competitors will already be experimenting with powerful new technologies to increase loyalty and drive stronger margins.

The value of data

Learning to collect and use relevant customer data is essential. Data is the lifeblood of modern business—it's the basis of being able to deliver any kind of personalised service on a large scale. Businesses need to use data to analyse behaviour, create profiles for potential new customers, build propositions around those target personas and then deliver a compelling experience. They also need to continually capture new data at every touchpoint to constantly improve their offerings.

Artificial intelligence (AI) and machine learning (ML) have a key role to play both in the analysis of the data and also in the automation of the customer experience. These technologies are developing at speed to enable us to improve our data analysis, pre-empt changing customer tastes and automate parts of service delivery.

More mature digital marketing

You can also now add in all kinds of technologies to the customer experience mix that are straight out of sci-fi. The internet of things (IoT) is here, with connected devices providing help in all kinds of areas—from keeping you on the right road to telling you when your vehicle needs maintenance, from providing updates on your order status to delivering

personal service wherever you are, and much more—enabling you to drive real transformation.

Moreover, intelligent bots are making it much easier to provide high-quality, cost-effective, round-the-clock customer support—able to deal with a wide range of issues—and using ML to improve their own performance over time.

Augmented reality makes it possible to add contextual information, based on your own products and services, to real-world moments. So, if you're a car manufacturer you may wish to provide help with simple roadside repairs (e.g. change of tyre) via a smartphone app.

Always omnichannel

Finally, whether at the pre-sale or delivery stage, your customer experience platform must give you the ability to deliver consistency at every touchpoint. Whatever channel, whatever time, whatever context, your customers must all believe that your whole business is one person.

Indeed, as Michael Schrage, author for the Harvard Business Review, said: 'Innovation is an investment in the capabilities and competencies of your customers. Your future depends on their future.' So you have to get as close as possible to your customers to learn what they want today, and understand what experiences they are likely to want tomorrow. Work backwards from that and use any technology that can help you deliver it.

Crunch time—what's cloud ERP really worth?

How effective are your financial processes today? Are they helping you to simplify decision-making so you can respond flexibly to market changes, or slowing you down and making you less competitive? You can now take a quick and simple online test to discover how much value you can unleash from implementing the latest, cloud-based ERP technology.

Cloud is now the standard environment for ERP and, according to the latest research*, 76% of finance organisations have firm plans to move there, with 51% planning to make the move within the next 12 months. The main reason quoted by finance leaders for moving ERP to the cloud is its potential for budget savings (47%), while the main benefit reported by those that have already made the move is staying current on technology (81%).

Yes, cost savings are also an important benefit reported by those that have implemented ERP in the cloud (63%). But usability benefits (76%), increased flexibility (65%) and, as already mentioned, staying current on technology are the top three benefits. So the cloud is now both the default, and also the most functionally effective way of implementing ERP—according to its actual users.

Discover new value

So what are all those new functional capabilities worth in real money? And what's the full value of moving ERP into the cloud for your business specifically, once you've also factored in the cost savings? There is now a useful online tool that can tell you. Simply enter a few details about your organisation to get started, such as annual revenue, industry and number of employees.

The tool will calculate your personalised estimate of the overall financial value of cloud-based ERP, and also provide individual analyses of how it can help you in each of these five areas:

- Improve decision making to drive more profitability
- Increase finance staff productivity
- Reduce accounts payable processing costs
- Minimise software support and upgrade costs
- Optimise planning and budgeting cycle times

Access endless innovation

Finance organisations that have made the move to cloud are enjoying major cost savings, as expected, and they're also benefitting from access to a wide range of new technologies. There's no more rip and replace every two years, followed by a steep user learning curve. Instead, there are incremental releases of software updates that drip-feed new functionality directly into everyday use. Moreover, advanced capabilities, such as intelligent process automation, machine learning and next generation analytics, are also being made available.

That means businesses that have migrated their ERP solutions to the cloud are able to make faster decisions, and are also able to create major, new, additional sources of value with the new technology. In turn, that's making possible a wide range of competitive benefits for cloud ERP users that are simply inaccessible to everyone else, helping them establish unassailable operational advantages.

* 'Combined ERP and EPM Cloud Trends for 2018'

Delivering a winning customer experience from the cloud

Your customers are what matters most. So the customer experience is critical. Your competitors will adopt any innovation to edge ahead. So you have to engage your customers more convincingly. That means providing one single, compelling brand experience that's consistent across all your communications channels and touchpoints at all times.

Delivering a winning customer experience is no easy feat, with all the open lines of communication to your customers and so many parts of your organisation involved. Internally, every team needs to know what every other team is doing at all times, with every single customer promise delivered efficiently and without fail. Externally, each customer has to have their expectations met perfectly as if they were dealing with one, single, dedicated account manager.

One approach, many channels

So, just like having that dedicated account manager, you'll need one internal system of record that everybody and every system works from at all times. It has to be smart enough to automatically flag-up relevant next steps, such as contacting customers when their subscription renewal is due, for example. And it has to prevent actions that could potentially harm the customer experience, such as ensuring promotional emails are not sent to customers that are in the middle of a complaints process.

Yet, beyond day-to-day management, this centralised marketing platform should also enable you to run highly sophisticated, completely personalised outbound campaigns across multiple channels. Your individual customers should receive the right communications at exactly the right moment in their buying journey. And your organisation should be able to achieve all that with minimal effort, achieving complete consistency in what it says across all your communications channels.

Social marketing and content

That will, inevitably, include social media. So you will need to be able to engage with customers at scale, via the social platforms of your choice—using intelligent tools to listen and make sense of the overall chatter so you can deliver the right content to improve audience engagement. And the ability to plan, craft and promote original and compelling content as part of the sales cycle will be essential too.

One eye on the future...

You will additionally need tools that can give you genuinely useful—indeed, powerful—insights into your marketing performance and customer preferences. How well are your campaigns, programmes, and messages driving engagement? You might need to know what user devices and tools are most popular, or how well you're performing on social media. Also, what insights can you gain from your customer data using A/B, and complex multivariate testing? And how are you increasing sales across your different segments and

channels? Being able to track and measure performance will help you to predict evolving demands, so you can satisfy them before your competitors and forge ahead with your customer experience.

One diverse cloud ecosystem

All these tools should be made available to you as part of a single, seamlessly connected, cloud-based marketing ecosystem that's integrated with as many partner clouds as possible. That will mean it will be accessible to every part of your organisation, and that the functionality of your existing cloud-based marketing tools can be included.

Bringing all these capabilities together will enable your marketing organisation to take a far more strategic, long-term view. You will be able to foresee market trends more effectively and react faster, helping your whole organisation become more agile and deliver the winning customer experience.

Sound interesting? Download our whitepaper, 'Marketing automation simplified', to learn more about improving your customer experience with an intelligent cloud-based marketing ecosystem.

The data-driven economy: beyond descriptive analytics

Information and business analytics are essential tools in today's business decisions. Where former GE CEO Jack Welch famously said that good decisions are made "straight from the gut", most people nowadays prefer to also base them on reliable data.

The flood of information

And my, how much data there is! Advances in Big Data and the continuing growth of the Internet of Things (IoT) are creating a flood of information that's growing exponentially every year. So much data, in fact, that it's becoming a major challenge just knowing what to do with it all. Data for its own sake is just costly, occupying valuable storage space—yet effective business analytics can unlock hidden meaning and provide highly valuable, actionable insights.

Competitive advantages

This is becoming more and more important to businesses in achieving competitive advantage. For example, by analysing sales data from around the world it may be possible to identify market trends, key target demographics and uncover new sales opportunities—and be the first to exploit them. By looking closely at supplier data, or performance information from your supply chains, you might be able to detect hidden problems that you can act on—and reduce costs or improve efficiency. Also, a key goal of many IoT applications is to produce data on how products are used in the real world, with the aim of informing and improving their design.

Data scientists

According to Rita Sallam of Gartner, "2016 is the year of modern BI and analytics. Organizations will continue to transition to easy-to-use, fast, agile, and trusted modern BI&A platforms deployed across the enterprise to create business value from deeper insights into diverse data sources." Along with this, the role of the data scientist—collecting, managing, analysing and interpreting vast data sets—is set to grow in importance significantly.

Descriptive analytics

Yet, until fairly recently, business analytics has been stuck in the past. Traditional, descriptive analytics seeks only to answer the question: what happened and why? It looks at past performance and seeks to identify the reasons for success or failure. This can be used to uncover trends in large data sets, and perhaps uncover problems and opportunities that are currently being missed.

Predictive analytics

Predictive analytics extends this to answer the question: what will happen in the future? It combines historical performance data with external data, and then applies rules and

algorithms to determine the probable future outcome of an event and enable different outcomes to be modelled. The effectiveness of predictive analytics is highly dependent on the relevance and accuracy of the external data sets used and the performance of your algorithm.

Prescriptive analytics

Prescriptive analytics not only anticipates what will happen and when, but also why it will happen. It suggests options on how to take advantage of a future opportunity or mitigate a future risk, and shows the implication of each option. It also helps optimize decision-making by showing companies what actions will help them maximize growth, given their business constraints.

Less is not more—more is more

The more that your company uses business analytics, the more value you're likely to be able to derive from it—especially as you move towards a forward-looking perspective—for three key reasons. Firstly, you will become better at collecting reliable data, so your results will be more credible. Also, you will become better practiced at analysing the data, and will have more historical data to compare it with, so can trace progress over time. Finally, you will be able to improve your analytical models, and have a far stronger understanding of the real-world factors that are likely to make a difference.

Look forward confidently

But if you're at an early stage in business analytics, that doesn't mean you need to start at the bottom with descriptive analytics and then work your way up. In fact, it's actually better practice—and will provide you with far greater business value—to work backwards from potential business decisions that need to be supported today and building prescriptive analytic models around them. The models can then be used to identify the data management, predictive and reporting capabilities required to support your planning and performance management processes.

Straight from the gut

Perhaps surprisingly, Jack Welch's credo still largely holds true: while highly significant, data and analytics is still only the third most important factor (23%) among business leaders in making major decisions—a long way behind their own intuition and experience (41%) and the experience of others (31%)¹. As we move beyond descriptive analytics, and the power of predictive and prescriptive analytics is proven over the next 2–3 years, that will surely change.

¹ 'Gut and Gigabytes', Economist Intelligence Unit (Published by PWC), 2014
http://www.economistinsights.com/sites/default/files/Gut_&_gigabytes_Capitalising_on_the_art_&_science_in_decision_making.pdf