WHITEPAPER

Transformation technologies forging our new world

The 10 digital transformation technologies forging our new world

Marc Andreessen, the legendary investor and founder of VC firm Andreessen Horowitz once said "Software is eating the world". He meant that digitalization was disrupting every business and every business model.

Little did he know quite how right he was: since that prescient comment, waves of new hardware, software and compute technology have only escalated the prominence of digital in our work lives.

The modern CTO (or CIO, or Head of Digital…) must stay on top of a wider range of disruptive technologies than ever before – and communicate their value meaningfully to the board; so that the need for continued digital investment can be met wisely.

Here are the ten top areas for digital acceleration (according to TechTarget's 2020 IT Priorities Survey) that enterprise must consider today.

1. Customer experience

Every business knows that customers are important, but COVID has put the digital customer experience front and centre like never before. Lockdown accelerated online shopping (for example, **Rakuten Intelligence** reported a 250% increase in online grocery shopping for 2020) and every business is having to learn to delight customers without ever seeing them. In fact, a **Walker study** claims that by the end of 2020, customer experience will have overtaken price as the most important brand differentiator.

Think about: your digital sales funnel

2. Application modernization

Life isn't always fair. And one particularly cruel injustice of the tech world is that first-movers and early adopters spend large amounts of money on systems which rapidly age. They are rewarded for their commitment with an albatross around their necks – as younger upstart competitors use newer, cheaper technologies to gain market advantage. Traditional banks, for example, continue to use mainframe computers designed over 30 years ago, typically costing $250M per annum and **eating up 80% of their budgets**; while challenger 'neo-banks' use today's lightweight technologies at 1% of the cost. The good news is that there are now many ways to extend the life of legacy systems, hybridise them alongside their replacements, or lose them completely. This is the discipline of application modernization – and it's seductive because legacy systems add no value – they are simply a permanent and increasing brake on business.

Think about: eliminating your legacy systems, once and for all

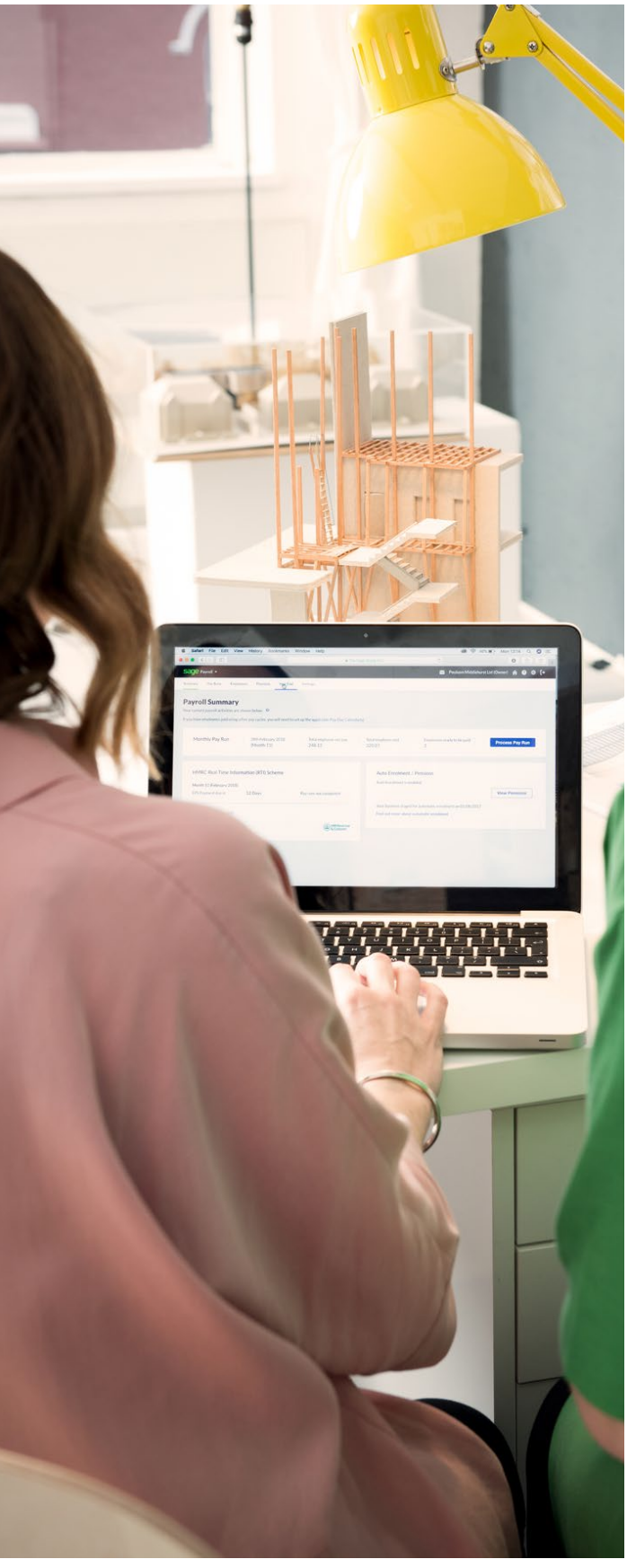
3. Cloud services and hybrid

One typical modernization activity is to move services to the Cloud. But modernization is just one reason for deploying cloud infrastructure. Other key factors include:

- ***Security:*** in the cloud, someone else can handle the ever-changing security landscape; someone who does this at scale, every day, and who is incentivised to get it right.
- ***Integration:*** cloud services connect natively and easily to each other, making it ever easier to design and configure meaningful new services.
- ***Bandwidth-ready:*** As 5G propagates and we become used to high-bandwidth connectivity, cloud services will become increasingly useful and globally connected.

In the meantime, as businesses wrestle with the move to the cloud, most providers now offer versatile hybrid solutions which keep on-premise systems available until a cloud strategy has bedded down and the last legacy customer has been migrated.

Think about: ways in which cloud services can generate more value than isolated systems



4. AI and machine learning

PwC predicts that AI will deliver an extraordinary **$15.7TN in global economic growth** by 2030. They **continue**: "Leaders are using AI to automate processes too complex for older technologies; to identify trends in historical data; and to provide forward-looking intelligence to strengthen human decisions. AI is making back office functions, such as tax and finance, do more with less and see into the future." The fundamental promise of AI is to allow machines to fulfil a range of business functions:

- Either more like humans (e.g. customer service chatbots which communicate in realistically human tones)
- Or better than humans (e.g. pattern-matching machine learning to spot errors and make decisions from large data sets more effectively than humans)

Think about: what your people could do if they had more time

5. Employee experience

COVID has renewed the focus on employee experience, for two reasons. Firstly, the upheaval of working from home on an increasingly permanent basis has highlighted the importance of employee wellbeing in maintaining productivity. For some, leaving the office has been a delight – a chance to spend more time with our families. For others, it has meant juggling work and home life in cramped conditions with little privacy. Smart businesses, seeking to attract and keep the best talent, are therefore putting effort into ensuring that the home-working experience is balanced and workable for all. Technology, from bandwidth to computers to communication and wellbeing tools, has been at the heart of this offer. Secondly, companies realise that employee motivation is one of the last largely untouched sources of new productivity. IBM **says** that "Organizations that score in the top 25 percent on employee experience report nearly three times the return on assets compared to organizations in the bottom quartile." Further research suggests that companies which invest in employee experience are up to **four times** as profitable (per employee) as those which do not.

Think about: the tools which will keep your team together, aligned and motivated

6. Big data and data management

We've already seen that AI promises to revolutionise almost every aspect of commercial operations. But AI eats a mammoth diet of data. Indeed, most digital systems need data to succeed:

- Machine learning needs large, granular datasets in order to make relevant and intelligent decisions.
- Business Intelligence systems need data in order to generate management reports and visualisations
- The Internet of Things will create new feeds of data, but the IoT ecosystem also demands data in order to make sense of our physical world and power new classes of decision-making.

Analysts **Deloitte write**: "The business objectives that could motivate a new approach to data include an increased emphasis on understanding and predicting business trends through analytics, a desire for machine learning and artificial intelligence applications in key knowledge-based processes, the need to stream data from and to machines using the Internet of Things, or increased security and privacy concerns. In many cases, these goals simply can't be accomplished without data modernization." Obtaining data from disparate systems and sources, storing it, making sense of it (turning data into information) and then using it (turning information into decisions) are all challenges which we conveniently bundle into "big data" and which must remain high on the digital transformation agenda.

Think about: the data you own and where it lives

7. RPA & digital process automation

Until COVID threw conventional wisdom out of the window, automation (often dubbed RPA – Robotic Process Automation) was undoubtedly the tech trend of 2020. That's no surprise: **Accenture** report that RPA should save businesses $5-7TN by 2025. The logic is simple. Automations cut costs by allowing employees to be more productive both by spending less time on repetitive tasks and using the time bought back on more strategic work – the sort of activities that computers can't do. The automation landscape includes everything from increasingly low-cost robotics on production lines to simple pieces of code which integrate software systems and therefore reduce manual work. Most seductive, however, is the fact that RPA is often very economical, requiring small investments (rather than big bang IT projects) to make a difference; and hence delivering a rapid ROI. Indeed, everything about RPA seeks quick wins. **Accenture continue**, "Automate intelligently by focusing on high-volume parts of the process instead of striving for completeness; by developing smaller process bits that can be directly validated and adjusted based on feedback; and by starting with lower complexity and building experience to scale up towards higher complexity use cases." RPA is often piecemeal, granular and fast.

Think about: the repetitive jobs you're sure could be done better

8. Network acceleration

Transformation applies to infrastructure as much as it does to customer-facing technologies, and a case in point is network acceleration; a set of disciplines around increasing information traffic across networks. Since the humble Zip file (or video encoding, or load balancing…), we have sought to make digital traffic move faster; but low-latency networks are becoming significantly more important. IoT will, for example, allow for the remote monitoring of hundreds of data points in a production line. But this relies on a stable and fast network with rigorous traffic management (aka 'Traffic Shaping') – otherwise time-sensitive alerts may not be dealt with appropriately. Similarly, with applications running in the cloud rather than on local servers, networks must be free enough for the experience of every employee (or customer) not to be impacted every time they hit a key. Technology is optimising everything else we do in business, and there's plenty of room to cut costs and ensure a sound user experience by optimising digital traffic, too.

Think about: your network bottlenecks

9. Monitoring & automation

We saw earlier that more industrial and commercial processes are going to be automated, and that a key function of automation is to handle BAU activities. But a second automation thread is monitoring for errors, exceptions and problems – and then ideally automating the response. Problems are, by definition, one of the most expensive aspects of a business. And we also know that problems are less expensive when they are dealt with promptly – ideally before they become crises. Predictive maintenance – spotting issues before they occur – is now saving money every day in industrial contexts, thanks to delicate monitoring using e.g. thermography, ultrasound and vibrational analysis. Airframe manufacturer **Boeing**, for example, runs an Optimized Maintenance Program by analysing thousands of datapoints from an airline's in-service maintenance activity in real-time alongside the client's business model and operational goals. Analysts **McKinsey** agree: "Instead of replacing a machine part after a certain time period, companies can extend its lifetime by measuring its condition with IIoT sensors. If a repair is not warranted, companies can delay it beyond the standard period. Improved condition monitoring typically reduces maintenance costs by 10 to 15 percent."

Think about: what you do when things go wrong

10. Security and risk management

We have left security to the end because it's an ever-present concern (or certainly should be!). But it is perhaps changing more rapidly than any other technology discipline. **Security Magazine** recently identified just a few of the ways in which the cybersecurity landscape is changing, including:

- The emergence of the Internet of Things which "has exposed devices to cyberattacks that a few years ago would never have been included in most threat landscape models."
- Drones as a weapon against physical security measures
- The challenge of securing decentralised networks like 5G

We can add to that list. **KPMG** notes that cloud resilience is becoming an important security discipline in its own right. And perhaps most importantly, humans remain the weakest link in cybersecurity; and with millions now working from home, there is a vastly increased risk from old techniques like phishing.
As Security Magazine continues, "Understanding today's threat landscape is critical to developing strategies and solutions to establish a strong cybersecurity framework. The adoption of new innovations creates an environment where threat landscapes can change quickly. It is critical for both organizations and individuals to not become complacent and remain vigilant, regularly defending their threat landscape."

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