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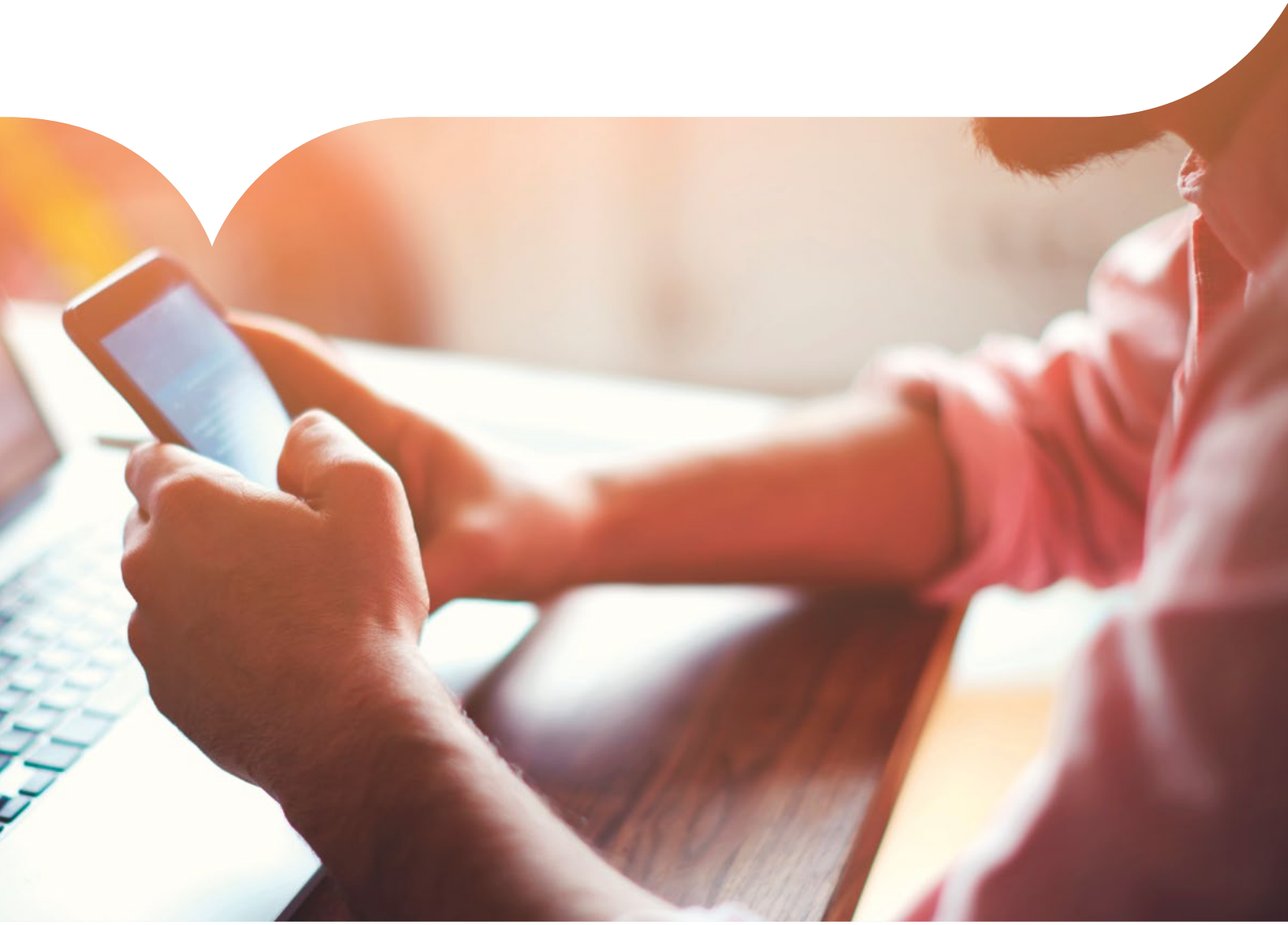
Destination Digital: Exploring the Hybrid Role of Tomorrow's CIO

Why the Chief Information Officer is also becoming the Chief Innovation Officer



People matter, results count.

Contents

Foreword	**3**
Global and Societal Changes: A Generational Shift	**4**
The Rise of the Consumer: Digital Expectations	**8**
Universal Technology: Today's Disruption, Tomorrow's Normality	**12**
Balancing the Demands of Hybrid IT	**16**
Planning your Digital Roadmap	**20**

Foreword

Much is written about how technology is changing the business environment. Every year there is a new trend that's going to revolutionize how we all work. That's been the case ever since the business computer first made its bow in the 1980s. With exponential improvements in processing performance (beyond what Moore's Law even predicted), the pace of development has, without doubt, been staggering – and it continues to accelerate.

My view is that we're now at the cliff edge of traditional IT. We've reached the precipice of where the "second platform" (networked infrastructures, off-the-shelf applications, etc.) can take us. CIOs everywhere are now looking out at a coming tsunami of digital innovations.

Having worked in technology for many years helping organizations develop IT strategies that support tangible business outcomes, I've never been as excited and enthusiastic about the role of IT as I am right now.

The digitalization of business models, the instant nature of communication, the mobility of workforces and the delivery of services on demand has taken us to the "third platform".

Yet, as we all know, the pace of change is not slowing. As these technologies quickly evolve and mature, we will soon be embracing a "fourth platform" where elements of Artificial Intelligence, Robotics and Ambient Computing become commonplace across business IT.

For you, as a CIO, these must be exciting – yet also challenging – times. Maintaining and developing your current infrastructure is a given. However, today's world is now also about embracing disruptive technologies that deliver a new set of business outcomes.

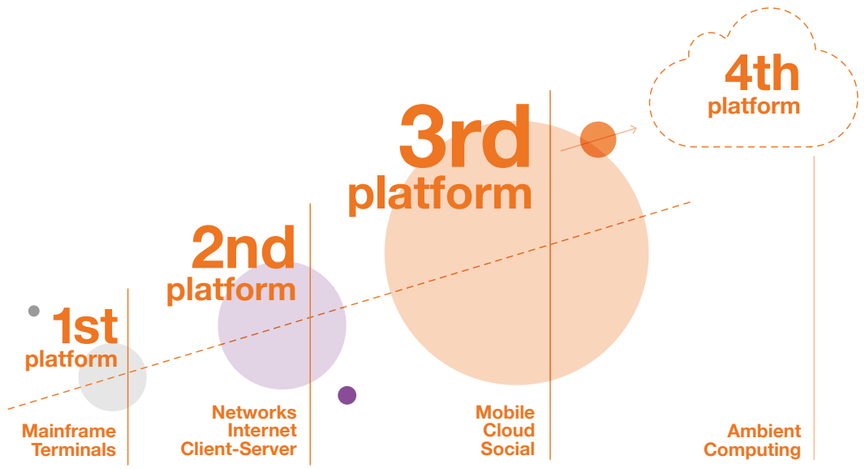
I believe there are three key influencing factors you need to hold in mind when taking on this digital challenge, all of which are triggering major shifts in technology priorities and investments:

- **Global and societal changes**
- **The rise of the consumer**
- **Universal technology**

Let's explore what these mean in practical terms for CIOs as their role becomes a balance of **information and innovation**.

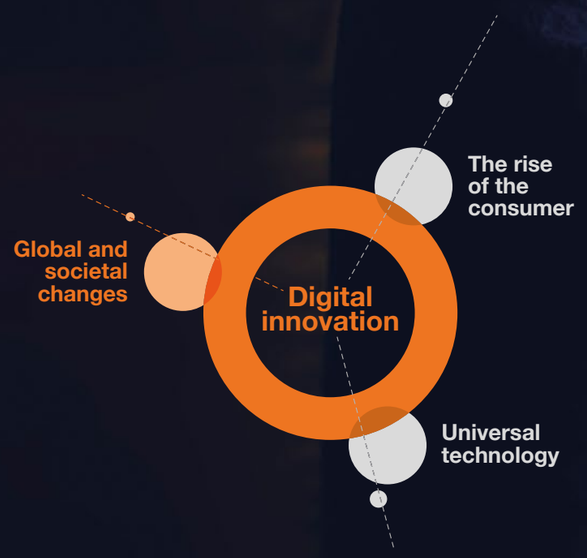
I hope this provides you with a different perspective and you are able to apply some of the principles to your own future roadmap.

David Blackwood,
Capgemini Infrastructure Services CTO



Global and Societal Changes:

A Generational Shift



Estimated value of peer-to-peer business loans in the UK by 2020: £12bn.

Today's global landscape is unrecognizable from that of a few decades ago. We're in a period of massive disruption, with developments occurring at phenomenal pace across every level of society and commerce. Driven by technology, this change is both unpredictable and accelerating and it can't be ignored.

We've well and truly entered the age of innovation, where the relative value of resources and people has shifted. People's knowledge, creativity and imagination are now sought-after assets, with governments offering incentives to attract the brightest thinkers. There is a move away from resource-centric economies in favor of digital, service-based operations. There is universal recognition that **innovation breeds success**, and the **disruption of established business models** is key to growth.

With innovation centers and hot spots springing up in ambitious cities like Toronto, Berlin, Tel Aviv and Austin (in addition to the established hub on the American West Coast), the constraints of geographical boundaries and traditional markets have eroded. **Human talent is migrating** to wherever conditions are most favorable. For established enterprises, this makes it difficult to forecast how tomorrow's markets will look, creating instability for shareholders, partners and supply chains.

Further instability is being caused by **disruptive financial models**, such as blockchain-powered cryptocurrencies like Bitcoin. These allow consumers to make payments from anywhere, at any time, in a secure and anonymous way, and they encourage businesses to trade across currency borders by eliminating the fees associated with typical exchange rates. We're also seeing the rise of peer-to-peer banking services, such as Funding Circle, that enable consumers to access finance quickly and more flexibly.

These are just some examples of how traditional business models are being disrupted, using technology to bypass established processes and infrastructures. The **millennial generation** is driving this; they have grown up with digital technology as their norm. So now, as they enter positions of authority and become business leaders, their default digital position is changing how we all purchase and consume.

Take the music industry as an example. It has jumped, in a matter of just a few years, from physical sales to digital sales to digital streaming. Consumers are moving away from wanting to own things to wanting to access things – whether that be via **rental, pay-per-use, on-demand or shared-use models**. Start-ups and entrepreneurs are meeting this demand, and they are quickly becoming market leaders.

Yet this picture of digital disruption is, itself, subject to disruption. Who would have thought, for example, that vinyl music sales would have undergone the resurgence of recent years? The aging population, with its relatively high level of disposable income, is driving a retro market that sits alongside the digital. It raises uncertainty about future markets and consumer behaviors – despite the massive impact of digitalization and connectivity.

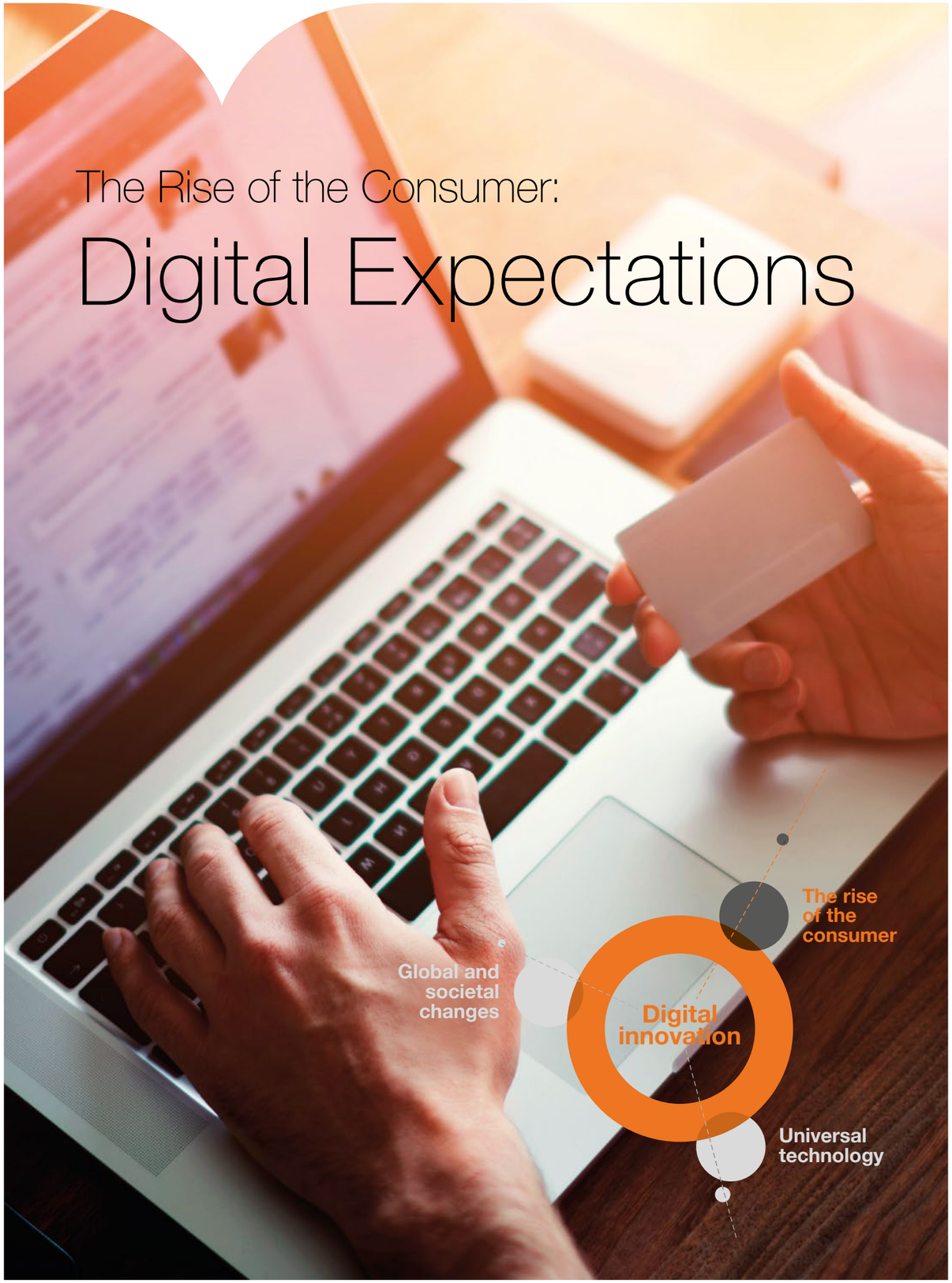
What does this changing world mean for the enterprise CIO?

It means that in order to keep pace, you need a better understanding of the rapidly changing consumer world. You need to shift from a mindset of "my role is to support the business with IT" to "I support new IT-driven business models that serve customers better". Viewed through the lens of an end user, you'll be better able to develop IT investment cases that respond to the demands of the business.

Picking Up the Pace with 5G

The next generation of wireless connectivity, 5G, will radically accelerate the global changes we've seen in recent years. With speeds 1,000 times faster than 4G, it will be the catalyst for a smarter world where everything is connected wirelessly – and it's not far away. An industry-backed 5G Innovation Center, spearheaded by the world of academia, is working to making it a reality by 2020. This will propel machine-to-machine communications, setting a new standard for the evolution of the Internet of Things.

We'll now explore the rise of the current consumer-led era in more detail and how it is rapidly changing the CIO's focus.



The Rise of the Consumer: Digital Expectations

We are in the thrust of a consumer-led era, where people are increasingly dictating how and when they want to receive services. Think how involved we are in our day-to-day purchasing decisions: reviewing feedback from peers, asking more questions than ever, scrutinizing the alternatives, seeking out the best-value retailer. Never have we had as much control over how we consume products and experience services.

Think also about how companies are taking product development out into the public domain, with end users directly influencing the feature set and design of new products. **Crowd-funding models** are enabling people to get their bright ideas off the ground in rapid time – and enabling consumers to invest in products that excite them – bypassing the traditional methods of raising capital and investment.

Consumers are becoming immersed far deeper in the purchasing experience. This also extends to customer service, which can now be delivered over **multiple channels** at different phases of the purchase. Got a product query? Send a tweet. You'll get a near-instant reply and, in all likelihood, a host of additional advice from a community of enthusiasts.

It seems that consumers now expect and demand an **end-to-end digital experience**. And as technology continues to remove the barriers of location, language and culture, people's engagement with the digital world is only going to increase.

So as a CIO, it's no longer sufficient to just deliver on a brief handed down by the business. The end-user experience is now the barometer of success. Everything has to be consumer-focused, which requires a consumer-focused IT infrastructure.

Gartner predicts there will be 25 billion connected things – or three for every person on the planet – by the end of 2020.

This is true even for your internal departments. Employees want to bring their own devices, work on the move and use the applications they use at home. Traditional business platforms alone don't cut it anymore.

In short, technology is no longer being led by technologists – it's being led by those that use it as a service. Business models are being disrupted by consumer-centric innovators – who are often just consumers themselves, developing more efficient, effective and convenient ways of doing the things they want to do.

The Digital Airport

Imagine waiting at an airport gate to board a flight when a robot greets you with your favorite bottle of wine and the wrist watch you've recently been looking at online.

The airport has gained insight into your in-store purchasing history from previous flights, identified what you browsed online today, located you to a precise spot in the airport, and then sent a retail robot to sell you your personalized products! In a digital airport, every aspect of your experience could be personalized – even waiting.

Technology already exists to make this possible: systems can capture, analyze and interpret personal data from previous airport visits; cameras can track a single person's geographical location within a sprawling building at any point in time; robots can be deployed to engage in personalized one-to-one interactions.

The opportunity is there for airports to revolutionize their customers' experience by integrating multiple systems and layers of technology. Those that try could set the benchmark for our flight experiences of the future.

What does this changing world mean for the enterprise CIO?

Firstly, with such rapid change and disruption in the market, it presents an opportunity for ambitious and capable businesses to explore new ways of serving customers and improving their competitiveness. This opens the door for you as a CIO to reconsider your planned IT investments and explore new technologies and innovations.

The power of disruptive technology means that CIOs are more relevant than ever before, you must rise to the challenge of being the Chief Innovation Officer, driving innovation for the business while maintaining and developing your classic estate.

You just need some certainty over what is a fad and what is the future – which is what we'll look at next.

CIO action point:

Investigate consumer-centric IT by introducing a low-cost proof-of-concept. The risk to the business will be low, and you'll gain significant knowledge to inform future developments.

The internet has transformed how businesses operate. It has opened up the provider market to smaller companies, start-ups and entrepreneurs to compete alongside established big players – breaking down barriers of geography, scale, reach and cost.

No longer is it necessary to outlay massive capital expenditure on high-performance computing environments and data centers, or make long-term commitment to software licenses. The internet and **cloud-based services have leveled the playing field** with flexible pay-per-use and on-demand models.

The Internet of Things is also fueling disruption, creating billions of connections between people, their activities, their interests, their work, their home. Companies that can capitalize on this connected world – using sensors, cellular communications and nano-technologies to enhance the customer experience – will thrive.

A significant opportunity for enterprise CIOs lies in the **next level of automation and autonomics**, when IT systems become intelligent and agile. Whereas previous systems would need to be re-programmed for each new task, we are now seeing the emergence of machine intelligence using algorithms. This is freeing up skilled staff to work on non-routine and creative activities

For the CIO, this presents a new dynamic to manage: talent and training. You'll need to be more involved in planning the organization's capacity and skills, working closely with HR to ensure you have the right people to balance your emerging processes and technology.

CIOs will also be marshaling a movement toward **cognitive computing**. As the Internet of Things swells and brings with it floods of consumer data, businesses will need to get value out of that data quickly (instantly, even) if they are to gain a competitive advantage. Cognitive computing systems, with the ability to spot patterns and understand trends like a human (but on a massive scale), will soon be anticipating business problems and solving them proactively.

CIO action point:

Encourage your staff to understand this disruptive world. Because they are closer to frontline delivery, they'll help to generate ideas for improving customer service.

Driving Toward a Fully Connected World

7.32am
Imagine sitting in a car on the way to work while browsing your personal news feed. It's a driverless car, of course, and it's borrowed from the company pool because you don't want the financial burden of owning a vehicle.

7.41am
During the journey (with your route optimized by crowd-sourced traffic data) the in-car assistant warns you that it's just detected a slow puncture. It automatically re-routes you to the closest service station, informs you of today's fuel price and asks if you want to send an order ahead for your favorite hot drink. It knows all this from your personal profile, which aggregates your work and life data, stored on your wireless ID badge.

7.55am
On leaving the service station, a manually driven car crashes into your rear. Sensors detect the extent of the damage and scan the manual car for insurance records. In-car cameras collate all relevant still and video images, time-stamped for authenticity, and a report is automatically sent to both insurance companies for processing.

8.02am
A local recovery vehicle has been requested, along with a replacement company car. Your work schedule for the day is automatically re-organized to account for your late arrival, and colleagues are informed of changes to meetings and deadlines. Your emergency contacts are informed of the incident automatically, and a voice-link is activated on your ID badge so you can request further support if needed.

This isn't some far-fetched scene from a sci-fi movie. The driverless car is one of the most talked-about developments in the technology sphere today – and it's fast becoming a reality. Consider the developments already made in the last 10 years: we use smartphones for GPS navigation, listen to streaming services and internet radio, pay for fuel via mobile apps, and use in-car cameras to reverse safely. It is not a massive leap to a driverless future.

IEEE forecasts that 75% of cars on the road in 2040 will be driverless.

What does this changing world mean for the enterprise CIO?

The underlying technologies required for such innovation are already here – from predictive analytics to intelligent sensors to the real-time connectivity of everything. The opportunity is there to embrace these technologies early, explore how they can transform your business models and steal a march on your competitors.

Now let's look at some practical implications of the digital revolution on your existing IT infrastructure.

CIO action point:

Use a small investment pot to explore your customer journeys. Build from there by embracing new digital technologies that improve customer service and enhance the consumer experience.

Balancing the Demands of Hybrid IT

As we move further into this consumer-led, connected, disruptive era, the emerging challenge is how to balance your core business systems developed over many years (finance, HR, etc.) alongside agile new services deployed from the cloud.

The global Software-as-a-Service market is projected to grow from $49bn in 2015 to $67bn in 2018.

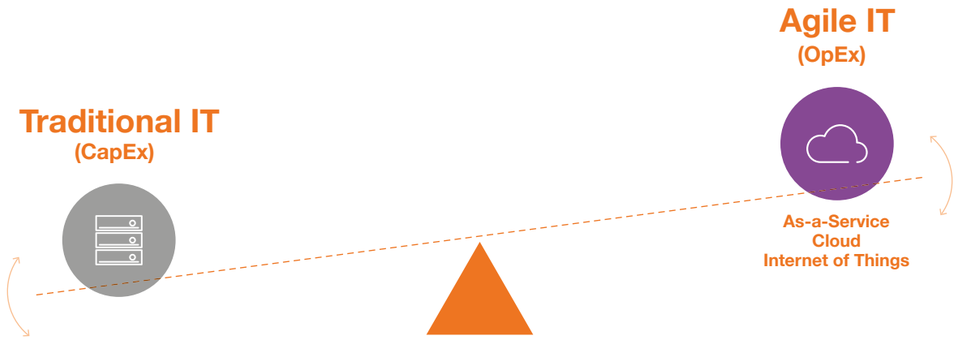
Gartner introduced the term 'bi-modal IT' back in 2014 to describe two separate modes of IT delivery: stable, traditional and sequential versus agile, exploratory and nonlinear.

Industry thinking now suggests that this concept has its limitations. In practice, a bi-modal approach can create two distinct silos of IT – with innovation focused too much on the agile side, leaving the traditional side to stagnate.

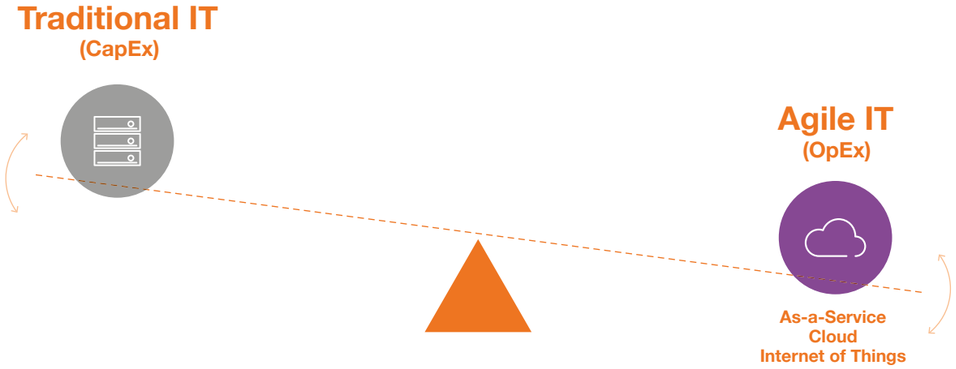
We prefer to think about it as 'Hybrid IT', where investment and innovation is balanced across both sides. The CIO of the future will be a broker of IT services to the business, managing a hybrid portfolio of physical hardware/platforms and flexible, on-demand, intelligent services.

The notion of Hybrid IT is analogous to a see-saw, with the CIO as the agile pivot between the two sides.

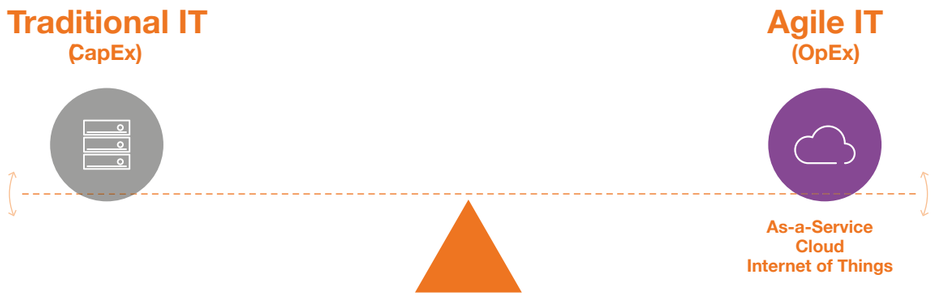
Typically, we would expect traditional IT to account for around 70–80% of spend (although this clearly varies across industries and sectors), funded predominantly through CapEx. The CIO ensures that this large infrastructure expenditure gives the business a solid foundation to deliver its core services. The remainder is typically spent on agile IT services, deployed flexibly from the cloud and funded mostly through OpEx, to drive innovation and competitiveness.



As the business increases its focus on agile IT and digital innovation, and seeks to move more of its CapEx over to OpEx, there's a risk that the balance could tip too far – especially given the pace at which the shift is happening. This risk is confounded by the ease with which new digital services can be deployed at departmental level (often referred to as "Shadow IT") via pay-as-you-use models, without proper engagement with the CIO.



It is the CIO's duty to ensure that there is balance in this Hybrid IT world. The traditional back-end IT infrastructure must still be able to support the core needs of the business and not become overlooked in favor of the agile. But equally, there must be a willingness to embrace digital and move IT spend toward innovation in order to maintain competitiveness.



Achieving the right balance between the old and the new raises a number of questions and challenges for the CIO. For example:

- How do you reduce the cost of your traditional IT?
- How do you leverage new technologies to reduce demands on the traditional?
- What impact will disinvestment in one area have versus investment in another?
- What demands will agile IT place on the existing back-end infrastructure?
- Where should investment be prioritized, and how do you phase the introduction of new technologies?
- What impact is 'shadow IT' having on the wider IT strategy?
- What is the implication to the business of not changing?

Balancing the Books in a Hybrid World

Business models themselves have to find that balance between old and new. When the trend for e-books was at its height, for example, there was a fear that traditional booksellers would be forced out of the market. Yet today the high-street book store is thriving more than ever.

By adopting a new customer-centric business model – with relaxed and child-friendly reading areas, plus in-store coffee shops – the sales of physical books are on the rise again. The industry has embraced a hybrid approach. Physical book stores have an online presence to allow for digital customer service and sales, while the pioneer of the e-book, Amazon, has even opened a physical book store in Seattle.

CIO action point:

- Plan for a more asset-light environment driven by automation, autonomics and cognitive computing
- Introduce value-add training programs to attract and retain the right people for a hybrid future
- Use a DevOps approach to align your development, quality assurance, and technical operations staff, thereby minimizing IT inefficiencies

Planning your Digital Roadmap

So what practical steps can you take today toward this digital future? Firstly, you need a roadmap for change – a transformational blueprint that recognizes the generational shift toward the technology-led, consumer-focused world we've considered here.

By understanding the patterns of change in the business landscape, you'll be better equipped to assess where your business currently is and how it needs to evolve over the next four or five years to compete more effectively. You can then plan out a roadmap for phasing in new technologies and innovations at a time and pace that's right for your business.

Start by looking at the trends happening in your industry now, and what's on the horizon that will be relevant to your customers and stakeholders. You can then **assess the implications for your IT infrastructure**, such as:

- When current systems should be retired
- When contracts can be left to expire
- What new platforms are required to support agile IT
- The impact on planned expenditure
- Investment approach to agile technologies

This will help you **clarify the type and level of resources, skills and assistance required** by the CIO office to support a Hybrid IT environment.

> "This new kind of CIO, who will move from chief information officer to chief innovation officer, will focus much more on being agile and adaptive."
> Alastair Behenna, Forrester

You're Not Alone

As an enterprise organization, you'll already have a large network of partners in place who you can call on for assistance, insight, IP and, indeed, guidance. Systems integrators, industry analysts, suppliers, start-ups – even your competitors – will all have useful knowledge to share.

Whether it's assessing the technology and industry radar, understanding the implications of the Internet of Things or thinking about how cognitive computing or autonomics might play a role in your future, it's important to seek external views before setting your digital roadmap.

Final Call for CIOs

The sheer pace of change and disruption that's happening across the world today has to be viewed as an opportunity by ambitious businesses. CIOs need to support that by adopting a digital infrastructure.

If you've not yet started on the digital journey, don't wait any longer. Work with your partners to embrace emerging technologies and innovations. As with most transformation activity, the sooner you start, the better – and there will be huge benefits for those that get ahead today.

CIO action point:

- Understand the technology radar for your industry
- Plan an exit strategy for IT that is reaching end of life
- Map out your current IT service contracts and expiration dates
- Develop a roadmap to phase in hybrid technologies, platforms and services

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