

# The IT function step-up or step-out!

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# IT is in an increasingly precarious position

In today's fast moving world of IT Consumerisation, Big Data and Everything "as a Service" the IT function is becoming sandwiched precariously between two rapidly changing environments.

- On the 'supply' side, IT is witnessing wholesale disruption of traditional outsourcing players such as IBM and HP as cloud becomes the de-facto standard for infrastructure platforms; implying partnerships with digital natives such as AWS, AZURE and Equinix.
- On the 'demand' side, many businesses are transitioning to software based products and services that require speed and constant innovation to maintain market leadership. This is frequently in conflict with traditional IT 'waterfall' development processes that promote efficiency over agility.

Consequently, IT is fast losing control of the end-to-end supply chain that it has managed for many 'pre-digital' decades. This is creating company-wide frustration as gaps open-up in service quality, security and data integrity.

In addition, excessive outsourcing and direct cloud-based service procurement by business functions has often stripped the IT organisation of the necessary skills and capabilities to deal with this fast-evolving digital world.

The dissolution of trust and competence in IT, if not tackled as a matter of urgency, will undermine an organisations' effectiveness, and limit its ability to compete. Our report argues that the IT function can maintain a central role if it adopts (and adapts to) a new model based on continuous service delivery; underpinned by re-usable software components, automated tooling, and rapidly scalable cloud platforms.

This will require new IT governance principles and metrics, capabilities, and tools, to meet the challenges of today's digital environment. In short, IT will need to evolve to a fundamentally different operating model – ideally following the lead from wider business transformation. Our view is that such new developments will enable the IT function to become an increasingly valuable business partner in the race for digital leadership.

## It is time for IT to 'step-up or step-out'.

In this report, we describe the nature of digital disruption within the IT supply chain (both supply and demand), the necessary changes required to ensure that the IT function continues to add value to its business partners, and five specific steps to establish a new and more effective IT organisation that aligns with the needs of successful digital businesses.

# IT sourcing becomes a ‘plug and play’ game

Much of an IT organisation's time and effort historically has been devoted to the strategic sourcing of relevant IT services such as infrastructure, and applications development and maintenance (ADAM). The rapid growth of cloud-based infrastructure and software services provides flexible and low cost options that don't require rigid and complex vendor relationships. Such 'strategic' IT vendors report a drastic reduction in contract size and duration implying a near universal move to a 'plug and play' approach to IT services sourcing. Such developments are favouring new partnerships with cloud providers such as AWS, AZURE, Google Cloud, and Equinix for basic compute and storage facilities.

At the same time, cloud platforms provide an ever-growing range of software tools and capabilities that enable IT organisations to 'spin-up' new applications in record time, superseding traditional development methods. This also enables businesses to take

control of solution delivery if the IT function is proving too reactive to their needs. In some organisations, the "transformational" aspects of IT are being stripped away and relocated into the businesses, leaving IT to revert back to a "break-fix" model reminiscent of a by-gone era.

In addition, 'Software as a Service' (SaaS) cloud offerings such as Salesforce, Dynamics and Workday are providing fully supported business applications such as CRM and HR over the Internet. These can complement or replace in-house ERP functions that have proven to be costly to maintain and inflexible to business change. According to some 40 leading CIOs that we interviewed during 2016, monolithic ERP systems are being rapidly 'hollowed-out' through SaaS adoption by non-IT functions such as marketing, finance and HR, reducing the requirement for internal software development and maintenance.

**Figure 1 – Cloud is transforming IT and business services**

Layer of the IT stack	Before cloud (pre-2010)	With cloud (post 2015)
Infrastructure	Captive data centres, and strategic vendor lock-in	Hybrid or public cloud with new partners such as AWS, Azure, Equinix
Data assets	Fragmentation of data assets (embedded in applications)	Common data assets available to all applications through a data warehouse or Master Data Management (MDM) solution.
Back-office 'core' applications	Monolithic and frequently customised	Integrated suite of SaaS and standard software packages
Front-office 'digital' applications	Detached from core IT architecture	Open platform shared with all applications
Business Services	Bespoke, complex processes	Simplified and standardised SaaS offers such as Workday and Salesforce

Source: Escaping Legacy report, University of Surrey 2016 - [www.surreycode.org](http://www.surreycode.org)



To exploit the growing number of commodity services enabled by cloud, these same CIOs are introducing a separate 'Service Integration and Management' (SIAM) layer based on Micro-service components, standard APIs and Service Orientated Architecture (SOA) to enable a 'plug and play' approach to IT sourcing. This has required the development of new capabilities including service integration skills, processes, and tooling. The decision to outsource SIAM as per Rolls Royce in the UK has proven to be a less than effective response to the new commoditised sourcing environment. Instead, most organisations are building their own SIAM capabilities with the help of external consultants such as Mozaic Services ([www.mozaic.net](http://www.mozaic.net))

## All businesses are striving to become digital leaders

The IT services sector is just one of many that are being disrupted by digital technologies such as cloud, mobility, data analytics, AI and IoT. A recent executive survey by the Surrey's 'Centre for the Digital Economy' (CoDE) suggests that such disruption now affects all sectors to varying degrees. Although some sectors are visibly well down the digital path such as media, retailing, financial services, and healthcare, others are likely to follow their example.

In the business-to-consumer (b2C) space, organisations are adopting a multiplicity of physical and online channels to conduct business directly with the end customer. Mobile and online customer interactions are generating vast amounts of data that give product and service managers powerful insight into consumer behaviour. Digital natives such as Amazon, Google, Netflix, and Facebook are exploiting machine intelligence to improve their services on a minute-by-minute basis. The advent of a wider environmental context, enabled by sensors, virtual reality, and 5G will elevate such interactions to entirely new levels, as will powerful new cognitive techniques.

In the business-to-business (b2b) space, Industrial IoT is helping companies to enhance supply chain performance by introducing digital connectivity between all assets, physical and virtual. GE has recently acquired the software house PREDIX to accelerate improvements in its global

operations. A further consequence here is that many industrial companies are moving to digital products and services, as in the case of GE Healthcare and Ford in its new generation of connected car. Even tobacco companies envisage embedding intelligence in e-cigarettes to monitor health and smoking patterns.

The common denominator within b2b and b2c is real-time insight into customer behaviour at every point in the supply chain as products or services are being actively consumed. In turn, timely intervention can be deployed at point of use, point of sale, and point of decision. In the words of one retail banker, his organisation will be able to offer you a customised line of credit on your mobile as you stand in a car showroom whilst contemplating your next purchase.

The implications of these developments are profound both for business and IT. To be a digital leader in the consumer or business-to-business space, organisations must acquire new data skills to track market behaviour in real-time, and continuously improve software to maintain product or service leadership. For example, Amazon updates its online platform hundreds of times each day. This implies constant experimentation based on the lean principle of 'sense and respond'. The availability of customer data is the key enabler of such an approach.

**Figure 2 – Digital is inducing tectonic shifts in business**

	Before Digital	With Digital
Competitive mega-trends	Hardware Products Transactions	Software Services Lifetime customer value
Performance optimisation	Operational excellence Consistency and reliability Low cost	Adaptability at scale Continuous experimentation Speed and agility
Organisational structures	Monolithic, Hierarchical Management intuition	Matrixed service teams Data driven decision making
Innovation	Projects Stage Gates	Continuous improvement Automated testing

**Source: Reorganising for digital leadership (MAXOS Group)**

As a genuine business partner, IT needs to shift its focus away from internal services, and associated operational efficiency, towards product and service innovation that requires speed and agility. In this respect, IT becomes a 'pathfinder' and 'orchestrator' for commercial product managers, equipping them with the latest digital tools to achieve their business objectives. With ever increasing choice of such tools, this task requires constant surveillance of the IT landscape to identify and test new techniques such as data analytics, cognitive learning, process automation and hyper-scaled platforms. Inherent in this new responsibility is the role of IT as a genuine innovator within its organisation.

The alternative, which is the case in a growing number of companies, is that a Chief Digital Officer (CDO) is appointed within the business to oversee new digital developments, leaving the CIO to manage traditional platforms and IT services (e.g. data centres and desktop). This split is not a sustainable solution for either the business or IT function (unless the two are one, as in the case of some business models) and can only lead to further fragmentation.

A fundamental redesign is needed before the situation deteriorates further.

Given the growing importance of software in today's digital products and services such as mobile banking, telemedicine, the connected car, and connected home, companies are beginning to embed software development capabilities into their product organisations, and finance these out of product profit and loss accounts. However, the product lines will continue to require key IT skills such as sourcing, data analysis, integration and testing, and cyber-security that only the IT function can provide.

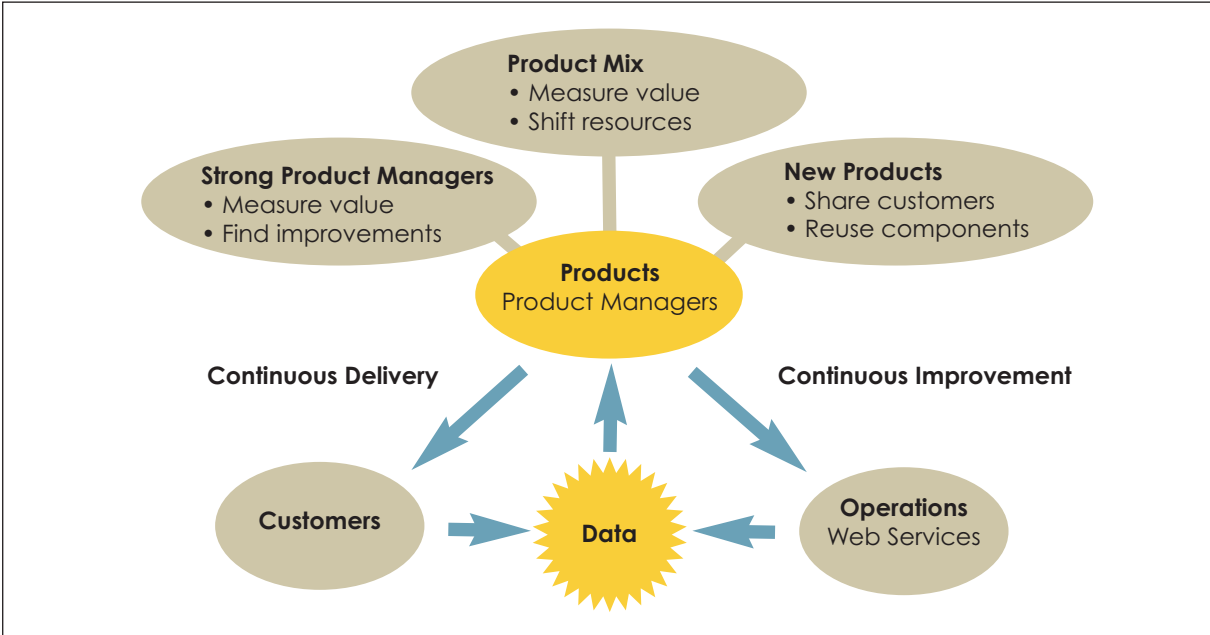
This can drive modern businesses towards a federated model where IT capabilities become a subset of product design teams and digital solution programmes – what MAXOS describes as a 'matrix of services'. Core IT remains a source of expertise, architectural control and innovative ideas.

# A digital landscape is emerging

To provide effective support for its business partners, the IT function needs to align itself with new commercial models that can deliver digital leadership. Our recent contact with both digital natives such as Amazon and Google, and large incumbents such as GE, Goldman Sachs, Microsoft, Roche, and Ford suggest that such leadership is based upon product-orientated delivery management with the following characteristics:

- Small product teams that face the market directly, and constantly experiment with new features to enhance customer experience.
- Data-driven decision making that measures business value and responds to social and business trends by constantly adjusting the product mix.
- Re-usable software components that improve operational efficiency and help accelerate the launch of new products and services.
- Scalable, cloud-based IT infrastructures that can flex to market need as and when products reach maturity and are adopted by global audiences.

**Figure 3 – Data-driven decisions lie at the heart of digital leadership**



**Source: Data-driven decision making (MAXOS Group)**

Such winning characteristics suggest a move away from hierarchical business structures to matrix organisations comprised of service teams that support the front-line product managers. In such a new business environment, the IT organisation needs to adopt an equivalent structure that responds directly to the needs of the product management team. This includes delivering re-usable software components that combine easily to form new products and services, as well as adopting scalable platforms that can facilitate rapid growth.

# 'New-look' IT principles and capabilities

The IT function has always been an internal 'service-led' organisation aligning itself with prevailing business structures. As these structures adapt to a digital environment, IT needs to take on the key features of its digital counter-part, the product managers, who face the external marketplace. To achieve the best fit with such partners, IT will need to adopt a new set of guiding principles that link directly to business strategy, key success factors and the prevailing culture. Research undertaken by the MAXOS Group in the USA suggests the following principles relating to business and IT:

- **Data should drive decision making** – this conflicts with traditional views that strategy and priorities set by management opinion should drive decisions. Business managers in 'digital companies' have more authority due to pervasive data, and can react rapidly based on the real-time analysis of abundant market data.
- **Data should be accessible, if not structured** – current wisdom suggests that data can be structured into 'one version of the truth'. In complex, rapidly evolving systems this is no longer possible or necessary. Teams have access to abundant data, and become more self-managing because they can select the data they need for decision making.
- **IT projects should be re-structured into products** with clear, real time value metrics and associated product managers. Traditionally projects were managed with stage gates. In a digital leadership environment managers use continuous delivery and improvement to stay ahead of competitors. The business drives IT value.
- **IT teams and software assets should be re-usable in multiple products** – historically such teams reported to specific product line or programme managers so they would receive clear signals about priorities. Digital companies become more adaptable and scalable because every team and capability is available to support new and expanding products.
- **Product managers and technical leads can make 'build or buy' decisions to get what they need** – this contravenes the traditional way in which IT controls such decisions (thereby improving support, interoperability, and security). The new approach enables companies to get things done faster, with less work. IT needs to step-up to this challenge.

The main lesson for IT here is to abandon conventional wisdom and adopt tomorrow's leading practices. Too many CIOs listen to analysts such as Gartner and Forrester who convey yesterdays' best practices. Success will be about constant, iterative experimentation and learning from the front-line rather than one's peers. In addition, rapid feedback loops with consumers will increasingly become the defining competitive differential.

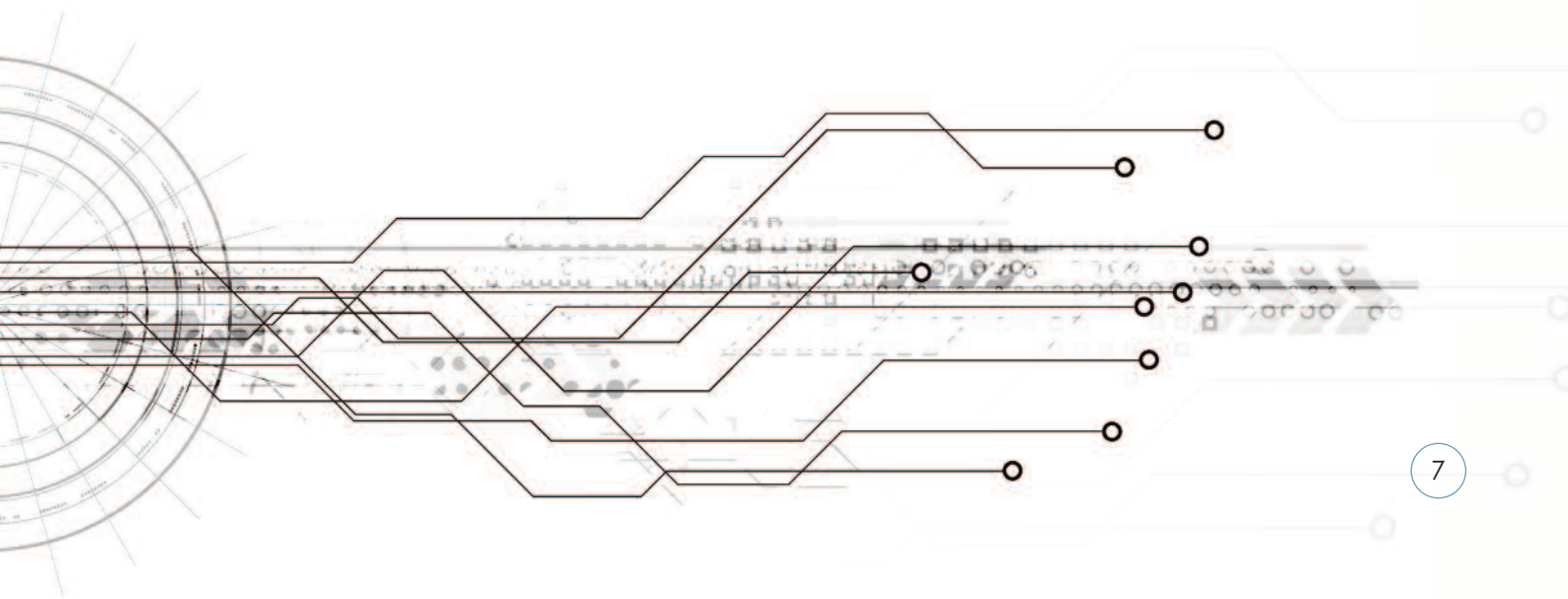
# We are entering a new era characterised by the 'death of experience'.

These guiding principles translate into five IT transformations that help set out a vision for a new IT role and associated operating model. See Figure below.

**Figure 4 – Five key transformations required for IT in large companies**

	<b>Historic state</b>	<b>Transformed state</b>	<b>Implications</b>
	Projects	Software Products	Focus on what business managers need such as re-usable software components or micro-services, and scalable platforms to support digital products and services
	Waterfall and Scrum	Continuous delivery	Small product teams that release software updates using high levels of automation for speed and quality assurance
	Monolithic Applications	Web Services	Re-usable components that can contribute to multiple products with open 'API' interfaces enabling rapid integration. Such components can be sourced on a 'build or buy' basis.
	Captive IT facilities and customised services	Hyper-scale platform services	Adoption of cloud services that have global scale and reach. Each service is intensively monitored and integrated seamlessly into the corporate environment
	Skills associated with legacy IT applications and sourcing	Pathfinder skills associated with digital leadership	Shift away from legacy preoccupations towards data analytics and security, cognitive learning, automatic testing, and new partnering skills

**Source: Future characteristics of the IT Function (MAXOS Group)**





# Overcoming today's structural challenges

Discussions with leading UK and USA based CIOs in 2016 suggests that the new guiding principles and capabilities set out above can vary significantly from the current realities of large IT organisations serving Fortune 1000 companies and government departments. The recent CoDE report on 'escaping legacy' suggests that most organisations are locked into rigid commercial contracts and heavily customised applications that will take years to unwind. Equally, most IT organisations report to the CFO whose principle concern is cost and reliability rather than speed and agility. Too many Transformation initiatives are in effect dressed-up cost-cutting projects.

Perhaps the most alarming feature of today's IT organisation is the profile of the IT skills base that is skewed heavily towards legacy operating systems and cultures. Many CIOs admit that only a very small proportion of their current staff are 'digital', and that attracting millennials into the IT organisation is becoming increasingly more difficult. As with parent businesses, all these challenges suggest a fundamental change in identity, culture, and capability if IT is to take on a leadership position alongside its business partners.

Some tactical approaches are emerging that will help overcome many of these major challenges. These include:

- **Modernising infrastructure** – commit to commodity supply sources and partners (e.g. AWS, Equinix and AZURE) that are compatible and capable of hyper-scaling. Implement a service integration and management (SIAM) layer within the IT organisation.
- **Exploiting data resources** – identify business owners, and associated data sets that support decision making. Regard data as a key commercial resource than needs to be captured and made accessible to product and operational management.
- **Streamlining applications** – migrate all applications to a cloud environment, and substitute with SaaS where possible to reduce maintenance costs and increase agility. Techniques now exist to migrate mission critical applications without increasing operational risk.
- **Enhancing business products** – identify re-usable software components and focus IT services on such elements, with appropriate product management. Promote re-use across business units to avoid 're-invention of the wheel'.
- **Aligning the IT organisation** – engage directly with business teams, and apply continuous delivery approaches to product and service development. Consider embedding IT resource directly within product teams or product engineering functions.
- **Upgrading capabilities** – prioritise digital skills and capabilities to supersede current resources, and develop small, agile capability units. Consider closer links with leading Universities such as MIT or Surrey to source such skills.

# Beginning a successful transformation journey

As companies such as Goldman Sachs, GE, Microsoft, and Ford have discovered, the task of achieving digital leadership is transformational and requires full commitment from the CEO. It affects strategy, culture, organisational structure, and performance metrics in fundamental ways. Such leaders are making the necessary investments in their futures such as GE's billion dollar acquisition of PREDIX. However, the rewards are already evident in stock market ratings as the gap between digital natives and traditional incumbents begins to narrow. In the same way, the IT organisation requires practical steps to take it along the road towards a radical new vision. Each step must produce measurable outcomes that demonstrate value within the new digital context such as increased speed and agility.

Our five recommendations for IT organisations who choose to embark on the digital path include:

- **Take stock of current IT partnerships and capabilities** – adopt an 'asset x-ray' of skills, system components, tools, and vendor relationships to identify gaps and efficiency improvements. For example, a move to cloud could generate 40-50% savings in platform costs, and deliver hyper-scale capability.
- **Select new partners to compliment in-house capabilities** – time to extract the organisation from rigid vendor contracts with companies such as IBM, HP, and off-shore players in favour of digital leaders such as AWS, AZURE, and Google Cloud. Digital leaders such as GE are insourcing their strategic IT capabilities.
- **Develop digital skills and capabilities** – construct a list of the main skills required to function effectively as a digital leader within the business. Pick one skill at a time as you progress towards a transformed IT model. For example, a starting point may be to rethink sourcing skills and capabilities ready for commoditisation. This should form part of a wider capability and organisational design review – with a major focus on cultural reforms needed to facilitate change.
- **Adopt a product-led approach to IT service delivery** – this requires extensive discussions with business managers to understand what software components (or micro-services) and platform capabilities will be needed to support future digital products and services. IT will need to generate value metrics that align with its business partners.
- **Focus production on software products or micro-services** – develop agile techniques for continuous delivery and innovation of re-usable components that serve multiple front-line product managers within the business. At the same time, develop automated testing of such components to ensure quality.

## In conclusion

Although 'digital natives' such as Google, Facebook and Amazon achieve all the headline news relating to the digital economy, many traditional incumbents such as GE, Goldman Sachs, Microsoft, and Ford are undertaking successful digital transformations, employing many of the same techniques such as data-driven product management, re-useable software components and hyper-scale platforms.

In this fast-evolving digital landscape, the IT function must undergo its own transformation journey if it is to remain relevant to its business partners. This will require an infusion of new skills, partnerships, techniques and governance principles that align with a digital business structure. By adopting such a transformation, IT can reduce operational costs whilst adding greater value to the front line.

The combined experience of the Surrey Centre for the Digital Economy (CoDE), the Founders Group, and MAXOS can help you to support such a transition.



## About the Authors



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