

# **Race to digital in the public sector** making life easier in a data-driven society

# Executive overview

Digital changes everything, challenges the ways we live and work, disrupts systems and processes...and makes our lives easier. Governments are as affected by digital as any other organization, but the public sector too often lags behind others in embracing the potential of digital.

This paper draws together the relationship between digital transformation in the public sector and the role of cloud as an enabler - in terms of its technology benefits and its business case. It aims to shine a light on the various choices and challenges in the digital and cloud adoption journey, and highlights the increasing number of successes worldwide.

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# Introduction

Many governments are struggling to use digital to make life easier for the people they serve - whether citizens of a country using national services, or local city or regional citizens using services specific to their locality, or citizens requiring specialist support at particular times - such as healthcare patients or students, for example.

**This is no longer sustainable. Growing pressures on governments can only be managed through digital change, underscored by a cloud strategy selected carefully to deliver flexibility, agility, and cost control.**

## What are those pressures?

Most important are evolving citizen expectations. Equipped and comfortable with cheap and powerful technology, we citizens expect the same standards of speed, joined-up service quality and transparency from governments that we experience in all other aspects of our everyday lives.

But our 'age of the citizen' is not the only challenge for governments. The tectonic plates of civic society are shifting. Our population is getting older, wondrous medical treatments are increasingly expensive, and global terrorism is imposing huge costs on homeland security - while our tax revenues are diminishing, and national economies are still recovering from titanic banking disasters.

It all means extra demands and resourcing headaches for education, emergency, healthcare, housing, pensions, and other key services. In a nutshell, traditional service delivery simply won't be affordable for governments in the long-term.

So how can this apparent contradiction be resolved? How can public organizations get closer to citizens and their requirements, and deliver change cost-effectively?

Digital is a powerful enabler that will help to square that circle.

Digital transformation can achieve the most aggressive cost-savings targets. Fast and easy to access digital self-service tools that are based on a wealth of actionable data intelligence about what citizens want and will actually use - not on irrelevant assumptions from the past - can deliver the most cost-effective citizen services, especially when supported by the business model flexibility offered by the cloud.

By joining up hospital, regional and national networks to ensure collaborative care, for example, or by equipping learners with smart resources, governments will shape the intelligent, intuitive, and personalized engagement that citizens expect and demand. Not only that. They will empower their own professional staff to make faster and better evidence-based decisions that spend public funds more wisely.

National governments are not alone in meeting the digital challenge. In the US, Asia, Australia, and in Europe there are pressures and incentives to invest in digital. The European Union, for example, recognizes that without a Digital Single Market (DSM), citizens will miss out on goods and services, and governments will not fully benefit from digital tools. The European Commission has recently launched its Digital Single Market (DSM) strategy, investing heavily in our future digital environment, and encouraging public sector backing for its aims.

Change to digital will not happen by international vision alone however. It requires careful planning and management from individual governments, based on three critical steps:

- **Develop a vision** for citizen led digital transformation
- **Select a cloud strategy** to exploit technologies and data, and control costs
- **Organize for success.**

This is a paper that draws together the relationship between digital transformation in the public sector and the role of cloud as an enabler - in terms of its technology benefits and its business case. The paper aims to shine a light on the various choices and challenges in the digital and cloud adoption journey, and highlights the increasing number of successes worldwide.

We will look at the main drivers for digital change, and examples of good public sector practice. On pages 6 to 7, you will find accounts of public sector experience in successfully adopting cloud strategies as a backbone to these innovative and life-changing digital measures.

# Developing the vision

## Citizen at the center

Of course, there is not always synergy between what governments want from digital services, and what citizens want. The classic example is tax collection. It's a crucial activity for governments, in order to pay for infrastructure costs and essential community services, but it's not always high on the citizen's agenda. Yet the benefits of operating a speedy, automated tax collection system, with fewer delays and less errors is of course as much to the citizen's benefit as it is to the collection department. It's just less obvious.

In the main however, citizens don't need a lecture on digital change. We feel the difference each time we use an app to order a taxi. We enjoy the convenience of making instant contactless payments via our smartphones. We don't have to imagine a futuristic fantasy of driverless cars: those cars are testing, now, in major capitals across the world.

We citizens of today see technology as a part of life. We expect government to catch up and offer better-designed and more appealing online services – and many of us are frustrated by the slow pace of change.

There is another big expectation, however. Citizens expect governments to offer the same delivery standards as other service providers. That means governments must learn from technology leaders how to provide the look and feel that citizens want from digital services. Important for successful customer-centric delivery is the quality of User eXperience or 'UX'. Good or bad UX will make or break the digital vision.

Not only does good UX drive usage of digital services. It also provides governments – in the same way as it provides the commercial technology companies – with data and opportunities to monitor regularly what customers want, and drives the inspiration for innovation and rapid improvements to meet changing needs.

The good news is that there are beacon examples of visionary digital government services developing rapidly everywhere, and citizens are loving them.

### e-Estonia goes global

One of the most unlikely places to find a future-facing digital vision is a country that 25 years ago was a USSR republic. Yet Estonia

has reinvented itself with an incredible digital program. Why Estonia? Arguably, apart from a combination of imaginative government, proactive ICT sector in the country, and a tech-savvy citizen population, Estonia was ripe for transformation precisely because it had no major IT legacy to hamper its progress.

There may well be lessons for other governments that try to excuse inactivity through IT immaturity.

The Estonia digital program means voting in elections from the comfort of your own living room. It enables citizens to file an income tax return in just five minutes. Most impressive of all perhaps, Estonia is the first country to offer e-residency to people from all around the world, offering state-proven digital identities that give overseas access to services like online banking, education, and healthcare.

With e-residency, innovative entrepreneurs can register businesses in as little as 18 minutes, check vital company, property and legal records online, and even integrate their own secure services with the ones offered by the state. A legally-binding contract can be signed over the Internet, from anywhere in the world, via a mobile phone.

Estonia is truly transformed. As well as providing modern services that citizens expect, it is forging a new concept of global citizenship to encourage the skills it needs for the future from people anywhere in the world, boosting international trade opportunities, enabling extraordinary interaction among government agencies and between government and citizens, removing stodgy layers of bureaucracy, and driving efficiency at all levels of government.

Estonia might be eye-catching, but right across the world governments are introducing holistic digital services that echo its aims.

Digital is connecting people and processes to deliver safer, energy efficient, healthier, more resilient, and more economically stable societies – where people's lives are simply made easier.

At a more local level, cities are also experimenting with digital potential. The CityPulse project, for example, uses Big Data digital intelligence to make the Dutch city of Eindhoven safer. It collects and analyzes real-time data from security cameras and social media to build a complete picture of the situation on the city's streets each night. If the data suggests a problem, CityPulse sends an alert to the police control room. Automated responses even help the emergency services by changing the colour and brightness of streetlights near to an identified incident.

New York's Hudson Yards redevelopment promises to be another flagship for digital innovation, using data from a range of sources to monitor neighbourhood air quality, heat mapping to track crowd size, and opt-in mobile apps to help collect data about users' health and activities. Sensors will also monitor pedestrian and vehicle traffic and noise levels, and energy and water usage.

For increasing numbers of governments and public authorities, the digital vision is becoming a reality in every aspect of citizen provision.

In Education, for example, schools are using digital to develop exciting new online learning concepts such as the 'flipped classroom', and a growing number of universities are widening accessibility to their learning assets with 'Massive Open Online Courses (MOOC)'. In healthcare, too, the digital hospital concept and a range of supporting e-health services are transforming both citizen experience and the efficiency of hard pressed health and wellbeing services across the world.

# Leverage your cloud strategy and exploit the power of digital

Today's household names in social media were once start-ups. So with the big search engine brands, familiar publishing giants, and hundreds of other data hungry internet companies. Their business models were unworkable and their growth was impossible without the storage capacity, agile accessibility, and flexible cost options offered by the cloud.

For aspiring digital governments, just as much as for commercial internet companies, success today is all about data. In our data-driven economies and societies, being able to store vast amounts of data - from mobile devices, social media, multimedia transactions, and increasingly from machine-to-machine communication, beacon technology, and low cost sensors - is key to securing digital new services for our citizens. And so is getting flexible and agile access to it.

Experts estimate that in 2012, the world generated and replicated about 2.8 zettabytes of data. That figure will grow to 40 zettabytes in just eight years! Governments must harness that data. They must exploit the potential power of Big Data to generate a wealth of actionable intelligence that will drive the quality of citizen services, and enable the decisions that ensure budgets are spent cost-effectively on what citizens want.

Key to that challenge is the ability to manage and analyse all that data, flexibly and cost effectively, with ease of access. And for public sector organizations as much as those in the commercial world, an effective cloud strategy is the best and proven response available.

To understand the growing need to move to cloud as an enabler for governments, we need to consider one of the most potent factors in today's data explosion and in the future: Big Data and the Internet of Things.

## **Big Data and the Internet of Things - the eyes and ears of tomorrow's citizen services**

As the world's population expands and regroup, we face dramatic social, economic and environmental challenges: overcrowding, pollution, resource constraints, traffic jams, and the need to deliver continuing economic growth. Government leaders must prioritize public safety and security, clean air and water, education and healthcare - and they need data to do it.

The Internet of Things (IoT) is happening now, bringing a new dimension to government know how about what citizens want and what works in practice. Take travel management for example - an increasingly important requirement for citizens. With IoT, machine to machine communication connects security checkpoints to electronic bag tags to ticket barriers in bus and rail stations and airports. Sensors monitor trains and buses on the move, and a host of trackside, roadside, and airside devices to support safer, eco-friendly, and congestion-busting measures.

IoT devices will generate more data than any individual Web application. By one estimate, there will be 5,200 gigabytes of data for every human on the planet by 2020. To support the billions of connected devices expected to arrive by then, we would need to deploy about 340 application servers per day (or 120,000 servers per year).

## **How will governments manage the volumes of data that IoT will generate?**

Cloud computing provides a clear way forward - not only to provide the storage capacity, but also to manage it cost-effectively on a pay-as-you-go basis, leveraging legacy IT, and enabling the smartest solutions to be easily developed and accessed.

Inevitably, IT departments are unable to manage the growing delivery gap. Filling that delivery gap by purchasing more hardware is not the answer. Procuring expandable services and IT capacity on a 'pay-per-use' (or hop-on/hop-off) basis is proving to be right solution, enabling public bodies to respond more effectively for citizens, and cost-efficiently for taxpayers. With the right cloud solutions, governments can cut capital costs, switch spending to operational budgets for computing power and additional

services as required. They can react to change, quickly scaling up or down their computing resources. They can achieve greater efficiencies and productivity from standardized processes.

Cloud might be the key to delivering public sector digital strategies for today and tomorrow, but in what form? There is no simple answer, and no single cloud solution that can be recommended as a starting point. Instead, there are a host of cloud offerings - platforms, modules, and services - that can be built upon, integrated and developed to meet each organization's distinctive requirements.

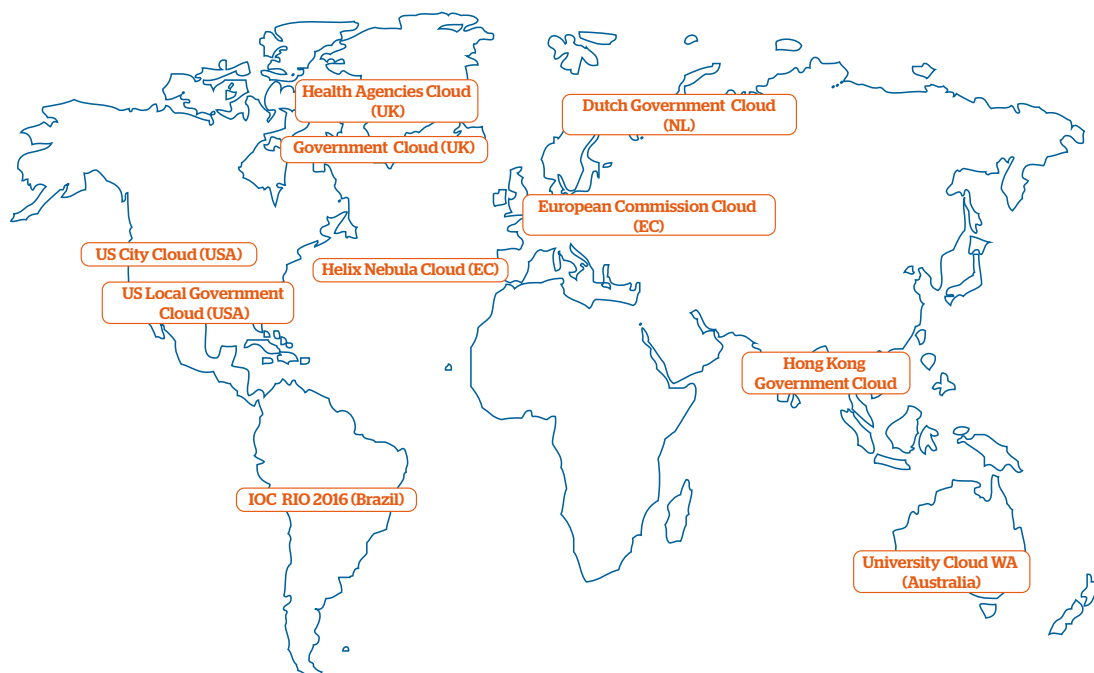
Choosing between them of course depends on knowledge and experience. Strategy, process and personnel are all pivotal, and extensive planning will be crucial to a successful transition.

Fortunately, there is also a growing body of Governments and other public agencies which have made the move to cloud. We now have public sector experience of cloud strategies and implementations from right across the world, for every size and specialism.

# Cloud is compelling all over the world

The public sector is using cloud strategies of all kinds to enable digital measures. Its importance is clear, evidenced by a direct correlation between lower costs and greater scalability, flexibility and agility.

## Atos Top 10 Government Cloud Platforms in Public sector



If we look around the world we can find a number of compelling examples where Governments and public bodies are moving to cloud-based business models in order to optimize flexibility, agility, safety, and cost.

In Europe, the Dutch Government started by virtualising multiple datacenters into one central location, able to deliver cloud services to its departments in a secure, privately owned, dedicated on-premise cloud platform.

The Government plans to extend its services to more departments, with more cloud services (from private platform and commercial cloud providers), integrated in a flexible broker platform.

In this example cloud-services are delivered safely and securely between departments, within the Dutch Government Cloud.

Also in Europe, the UK government is adopting a unique cloud market place for the public sector with its G-Cloud framework. Harking back to an age of Thatcherite encouragement of public sector and commercial collaboration, G-Cloud today represents a mature cloud environment. Using a central procurement catalogue, public sector agencies can access more than 800 suppliers and 7,000 services across all types of cloud service models, including public, private and hybrid. The offerings are not

connected and not integrated with legacy services, although services can be procured from the catalogue to assist integration.

Another important initiative in the UK is the Department of Health's dedicated cloud platform, providing a secure, controllable - but easy - access service for health agencies requiring IT services. For the past four years, UK health agencies have enjoyed dedicated, safe cloud services delivered via the Department of Health platform.

One of the largest US states has transformed its entire IT outsource approach using a cloud-based business-model, in order to

deliver improved IT services to counties, cities, schools, police-stations, and any other public body that requires fast, flexible, agile, secure, and low cost IT support. The state needed to respond flexibly to a growing demand for faster and reliable IT services in a private cloud environment within the state, and to provision new public cloud services from large commercial Cloud Service Providers. A fixed outsourced IT environment could no longer deliver that requirement.

One of the earliest adopters of cloud based business models in government was in Asia. In 2012 Hong Kong began to restructure its entire IT provision as a cloud based private model where public bodies in the area can use services in a dedicated, highly secure cloud environment. Departments, agencies and other Hong Kong public bodies can consume cloud-based services from their internal, completely secured private Government Cloud platform.

Australia provides a unique example where a large university with nearly 25,000 students has invested in a new cloud based model in a shared but dedicated environment. Interestingly, by choosing a full shared environment, the implication is that no capital expenditure is required. The whole university consumes IT-services from a shared cloud platform that does not belong to the university.

The cloud model is designed to deliver fast and agile state-of-the-art new IT services at low cost for a fast growing student population. The university's investment is secured on an operating expenditure basis, and more students are attracted by provision of more digital services.

Feel the difference - and the power. What these examples also show is that there is no one cloud solution for governments. By its definition cloud is flexible for everyone's requirements.

One example of the kind of issues faced by public sector organizations when considering cloud adoption is trust and privacy, and in Europe particularly there has been strong advocacy for a 'Trusted European Cloud' (see the Atos White Paper '**Enabling Trusted European Cloud**', available for download from the Atos website).

With data now viewed as any organization's most valuable asset, it is important that trust and control are not confused, however, and that control does not restrict an organization's ability to be agile in its IT provisioning. Regional responses - such as recent initiatives from the European Commission on the Digital Single Market (DSM) and the European Cloud Initiative - have a major part to play in offering a cloud solution that assuages governments' concerns over security and the right to privacy, but also that ensures that they keep pace with the region's data regulations.

The EC itself designed a framework for its own procurement agencies last year, separated into three lots: a dedicated private cloud, custom-built for the EC's own usage, and two lots with a limited number of highly-qualified selected Cloud Service Providers (CSPs) delivering a range of cloud-services in a mini-competition. The framework gives the EC a dedicated environment for classified information on the private cloud, and best-of-breed and best-price cloud-infrastructure over the run of the contract.

There are a wide variety of cloud platforms available for governments, either completely privately owned or shared. Privately owned cloud platforms are more costly, but can be paid for by operating expenditure. We are also increasingly seeing CSPs deploy cloud-service brokerage platforms, where the whole range of cloud-types from the various vendors is integrated and provided by one broker.

# Organizing for success

## optimizing for cloud readiness

Increasing costs of servers and other hardware, software licensing and maintenance, and human resources, means scalability is one of the reasons that cloud is highly attractive to governments - as they never know where citizen demands will lead them next. The right cloud infrastructure will offer increased flexibility, and decreased costs of securely shared infrastructure and service on demand.

However, the uncertainties of a digital future - including the explosion of data to be managed, and the major decisions to be made about types of cloud support - inevitably cause stresses within the organization, and potentially wrong and costly decision making.

### Stealth spending

One of the most talked-about effects of this potential vacuum in cloud strategies is the trend towards shadow IT - spend by staff without authority from the IT department, largely in response to the speed of digital change and the seeming need to respond without planning. The Atos cloud organization recently found that 60% of Chief Information Officers believe that shadow or 'stealth' IT spend is more prevalent than ever.

How do governments manage this trend - inevitable perhaps where organizations are encouraging fast responses to citizen demands, and where traditional IT department decision-making might seem to be a barrier to digital transformation?

The most obvious short-term response is to institute stronger governance in IT departments. As organizations embrace digital, it is essential that the IT department not only provides the IT infrastructure and services to enable and support the digital transformation, but also the governance model to maximize cost efficiencies, manage risk, and provide the business with secure IT services, potentially from outside the IT department via the cloud. This is an area that cloud providers can deliver as part of their service.

### 2 speed IT

There is another response to resolving growing tensions between technological and operational needs, between supply and demand, agility and stability, and between short-term cost savings and long-term value. That response is 2 speed IT.

2 speed IT means managing operational and digital speeds simultaneously. For organizations that can truly master it, the power of combining digital speed patterns with massive data platforms for operational requirements opens up new opportunities for digital delivery that really can meet changing citizen demands, enable core functions to be protected, and keep a lid on IT budgets.

### Reorganizing IT for change

Cloud delivers an opportunity to reorganize government IT operations in order to best manage the growing complexity of digital systems, and serve multiple citizen demands via multiple channels. There may be a requirement for shared services, and with cloud infrastructure there is likely to be a need for less resource within the IT department - providing opportunities for cost savings or for committing to new priorities.



# Getting it done

## talk to Atos

As a global partner and technology integrator for public services of all kinds, and a Tier-1 European cloud services provider, Atos knows that by driving effective, connected digitized services, we can make life easier for citizens and deliver cost-effectiveness at the same time - and position the right cloud strategy for governments.

To achieve that, we help public sector customer organizations to design services based on digital, mobile technologies, and interactions, built with people and their needs firmly at the center.

More than 25% of our business is generated by public sector and healthcare clients, so we are strongly focused on their requirements.

We have public sector and healthcare customers all over the world, and our European customer base is particularly strong.

We also have an important role to play in helping governments to develop the cloud solutions they need. Atos can deliver any kind of platform cloud service, whether private, public, shared, dedicated, on or off-premise or hybrid - connected and integrated with existing IT environments.

As this paper emphasises throughout, these platforms are crucial in enabling transition to digitally-driven government. We help to carefully manage that transition to avoid interrupting services to citizens, and our solutions deliver significant achievements:

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## eGovernment solutions drive down costs and boost citizen experience

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- Better collaboration between government departments
- Shared services
- Reduced duplication of efforts
- Improved efficiency
- Better engagement with external stakeholders
- Better user experience: easy (mobile enabled) access through online delivery,
- Citizen empowerment.

## Managing citizen-centric data strategies

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- Cloud products and services to improve cost-effectiveness and flexibility of delivery
- Reduce IT costs and improve citizen service by renovating core systems with more efficient digital tools
- Complete protection of every aspect of citizen and government data, identity and privacy through advanced, evolving cybersecurity technology.

## Healthcare

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- Integrated care - switching from fragmented to coordinated medical services
- Collaborative care - working together with patients and families to improve treatment success
- Mobile care - managing personalized care plans for patients at home with remote access through mobile devices
- Care analytics - combining relevant data-sets from patients, test groups, and research centers to improve medical decision-making.

## Defense

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- Active international partner for many defense and security agencies including:
- Australia, Brazil, Canada, France, Germany, NATO, the Netherlands, Spain, and the United Kingdom.

## Big Data analytics reveals new truths

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- Unearth actionable intelligence to understand what citizens really want
- Design innovative, streamlined and personalized services
- Identify vulnerable citizens who need careful responses from local services
- Predict future requirements to enhance citizen's lives and operate effectively
- Develop new ways of working and new multi-sided business models that create
- Value for government, businesses and citizens
- Discover fraud through analysis, and develop prevention and detection strategies.

## Smart cities

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- Create a digital-first platform for citizens to access all city services from one single website - improving citizen services and saving the city time and money
- Save time and lives by operating the city's emergency management system, making sure the right services have the right information at the right time
- Give direct access to public services - from making a grant application, reporting an incident, or registering a birth, death or marriage
- Visualize data across multiple departments, helping the council make more informed decisions for its citizens.

## Education

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- Digital learning and collaboration environments for teachers and students
- Smart online examination systems
- Digital content management for media-rich libraries
- Student information and educational logistic systems
- Campus identity, security and risk management
- Digital university
- High Performance Computing power for science analytics.

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## Our cloud credentials

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Atos is a leader in cloud solutions and services, and the number one European player in private cloud services. Through Canopy, the Atos cloud company, we deliver a full spectrum of cloud services - from modeling and realization to individual cloud-based delivery models for infrastructure, platforms and software.

We work closely with legislators and other companies in developing strategic cloud strategies for Europe. Our CEO, Thierry Breton, was a member of the Steering Board of the European Cloud Partnership (ECP), for example. Atos Research and Innovation (ARI) has strongly supported that EU initiative, running a number of projects that contribute to the concept of Trusted European Cloud.

Strengthening the cloud with better service levels and more information integrity, we empower public sector clients to freely deploy cloud architectures at any point across their organization.

We're helping governments deploy the right cloud computing to deliver digital, and make citizens lives easier.

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## About Kay Hooghoudt

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Kay is Global Director Digital Transformation & Cloud for Public sector at Atos. He joined Atos in 2007 in the Netherlands. He broadened his role in 2012 as Vice-President Strategy & Business Development Public Administration & (Higher) Education. Kay has a clear vision on the benefits of using technology in the Public sector, Digital Transformation for public bodies and Cloud-adoption in Governments as well as in (Higher) Education. He has worked with senior (Government) Executives in the public domain around the world on how to use technology to enable them to withstand challenges they face in the fast moving world and adopt speed, agility & flexibility. He believes that new technologies like Cloud & Digital Transformation can connect the New Generation, giving an answer to consumerisation, globalisation and cost pressure. Kay had previously a long track record in Government Services, with more than 15 years in senior management positions in the Dutch Government. In that role he has gained vast experience in developing national and international strategies and sharing best-practices as Project Leader in the European Union.

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# About Atos

Atos SE (Societas Europaea) is a leader in digital services with pro forma annual revenue of circa € 12 billion and circa 100,000 employees in 72 countries. Serving a global client base, the Group provides Consulting & Systems Integration services, Managed Services & BPO, Cloud operations, Big Data & Cyber-security solutions, as well as transactional services through Worldline, the European leader in the payments and transactional services industry. With its deep technology expertise and industry knowledge, the Group works with clients across different business sectors: Defense, Financial Services, Health, Manufacturing, Media, Utilities, Public sector, Retail, Telecommunications, and Transportation.

Atos is focused on business technology that powers progress and helps organizations to create their firm of the future. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and is listed on the Euronext Paris market. Atos operates under the brands Atos, Atos Consulting, Atos Worldgrid, Bull, Canopy, Unify and Worldline.

Find out more about us

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Let's start a discussion together



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