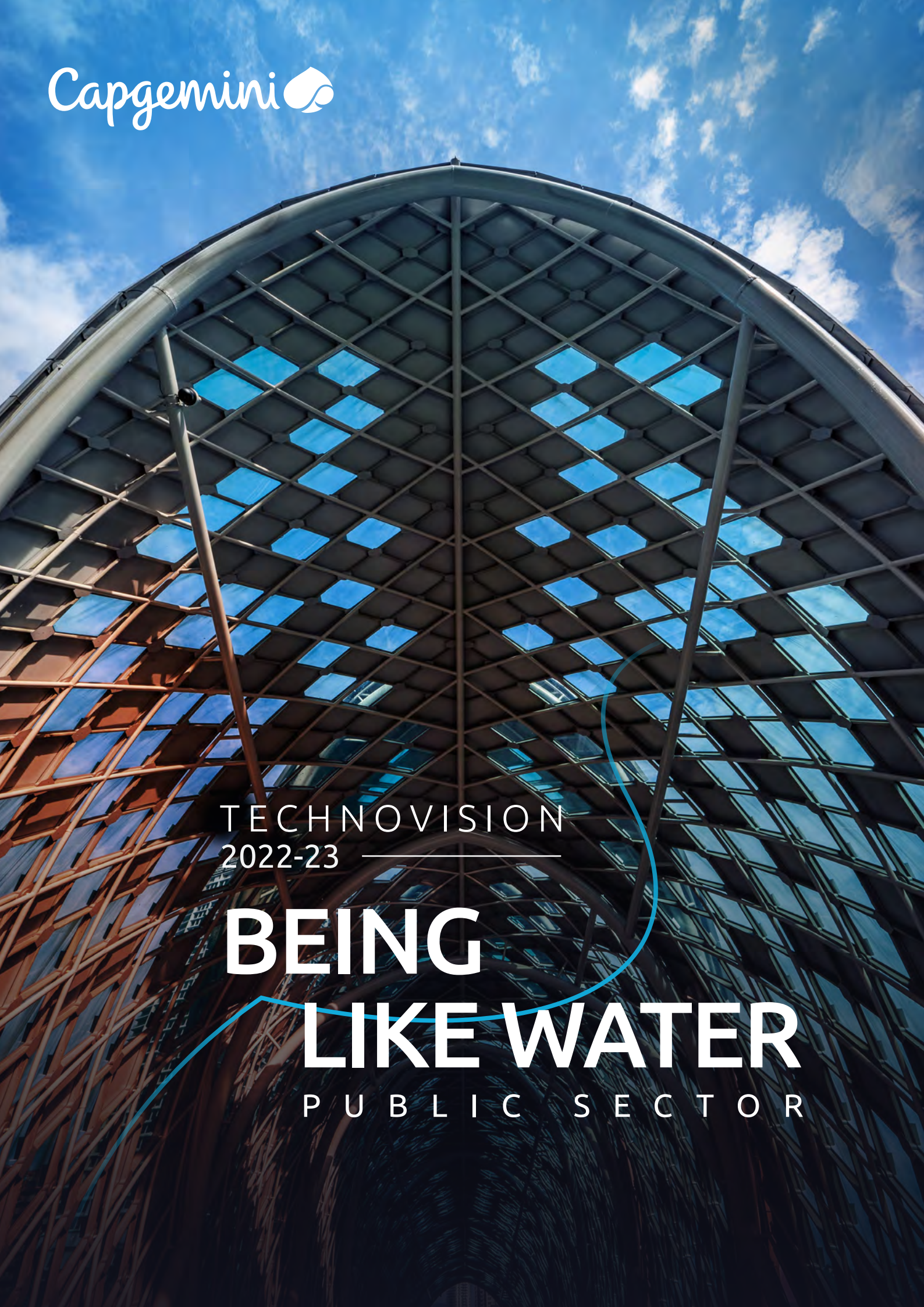
Capgemini
TECHNOVISION
2022-23
BEING
LIKE WATER
PUBLIC SECTOR

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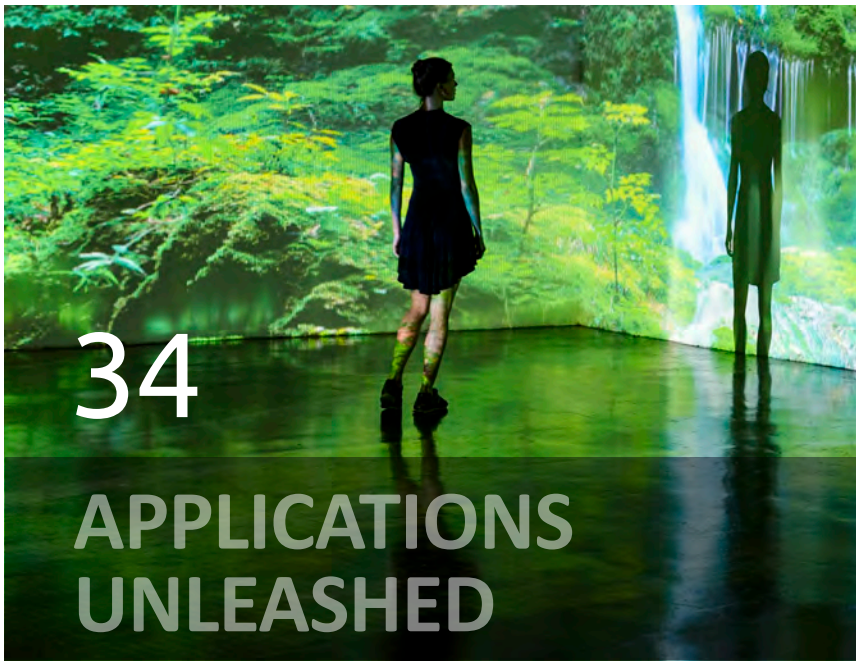
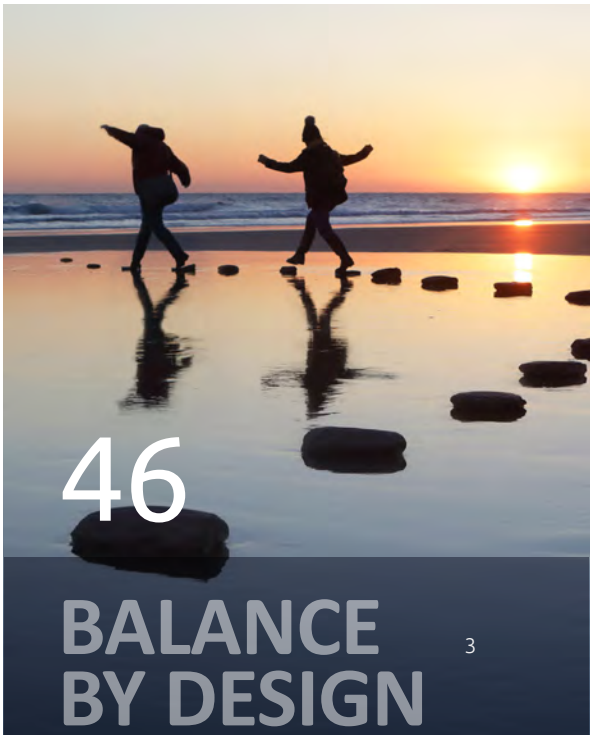




FOREWORD

Governments worldwide are responding to disruption on a grand scale.

Geopolitical conflicts have escalated. Supply chain bottlenecks and labor constraints persist. Economic factors – especially high inflation, rising interest rates and volatile commodity prices – threaten the social fabric. And as the climate warms, new sustainability realities are biting hard in the form of droughts, floods, wildfires and food shortages. This is an era of profound, mounting, interconnected crises.

The times we are in call for big policy responses from our governments. The era of managing the status quo more efficiently is over. To address the most pressing problems our societies now face, they will need to adopt a mission-oriented approach that mobilizes resources from the public sector, private sector and civil society. They will need to strategize, organize and deliver in new ways to deliver far-reaching changes and transformational outcomes. In this context, technology is a vital enabler.

Technology is a constantly evolving toolbox that can be used to overcome diverse challenges. With the effective use of technology and data, public sector organizations can help deliver better services to citizens, make better use of resources, create smarter and greener places to live, and provide better healthcare and education to the people who call these places home. In this data-enabled environment, technology determines the winners.

However, technology also determines the losers. Technology can be used to improve society, but it can also exacerbate inequalities. Governments have a duty to ensure that the ways they use technology to shape the world do not lead to societal exclusion for anyone.

To ensure that states and organizations use technology in a sustainable and inclusive way, a proactive and comprehensive conversation between public sector stakeholders and IT is key. That's where we can help. To enable a more fruitful dialog, we

are delighted to introduce the public sector edition of TechnoVision, our annual guide to the technology trends that all public sector organizations should be considering today.

TechnoVision is a unique and proven source of technology advice written by our leading experts across the Capgemini Group. This public sector edition brings together technology-driven, real-life studies from all forms of government. These stories are written by a diverse team of top practitioners and experts across 12 countries and from many of our organizational units, always with the goal of showing how and where these technologies can add value.

The theme of TechnoVision 2022 is "Being Like Water," with a focus on key concepts such as fluid adaptability, agility, and resourcefulness. This focus is apposite given the challenges faced by governments during the past couple of years. The pandemic required rapid responses across the public sector, from the overnight transition to home working and the establishment of online-only delivery models, to the rise of telehealth and the creation of systems to help manage patient care and vaccinations in healthcare organizations.

The pandemic highlighted clearly how rapidly the public sector must deal with change. Organizations had to scale up critical infrastructure and applications in weeks (or even days), leverage key data for decision making, and work across organizational boundaries and formerly impenetrable borders of responsibility. More broadly, we believe the pandemic response is a dry run for the upcoming transformation towards a sustainable, societal development model. This model demands unprecedented change in a short time. More impactful changes will be called for, and at a faster pace than most organizations can currently keep up with. Technology brings the breakthrough tools to help us manage this transition while protecting standards of living.

We believe the scale of change is such that every organization in every sector is now a "Technology Business," which must be fluid enough to adjust to the new challenges that arise. Unless senior stakeholders are intensively involved in Technology Business decisions and initiatives, achieving digital-led breakthroughs across the public sector is impossible.

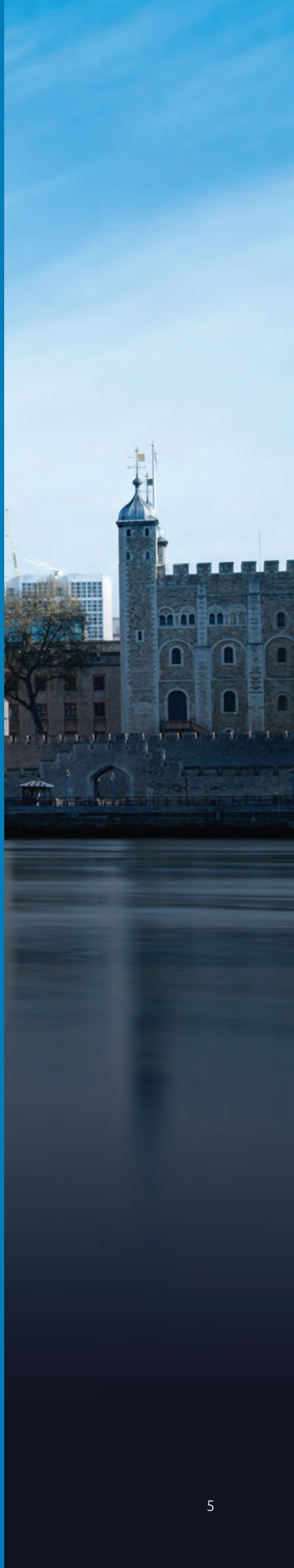
Technology holds many answers and enablers, but we must understand how its components work together. It is up to governments to set the standards upon which technology components should be interconnected and communicated, such as helping a city orchestrate the many players involved in making it a smart city. TechnoVision is a framework that is designed to support such dynamics. Throughout its coupled modules, trends, and "containers," this framework enables an ostensibly open, collaborative ecosystem, which aims to give its users control – or, as we would call it these days, sovereignty.

This approach, modeled after the Greek "polis," aims to build an "agora" – a central marketplace to discuss and negotiate the future of its body, balancing the interests of politicians, administrative domain experts, the departments of the chief information officer, chief digital officer, and others.

Through TechnoVision, public sector leaders can find a common language to articulate their technology-driven goals and plans. This is increasingly important where closer federal or regional collaboration is needed.

Let's therefore embark on this vital dialog taking place in our technology agora. Let's shape the future of our society while having some fun in the process. I look forward to learning from your feedback and our common discussions, and I hope you will find this framework invaluable as you look to achieve your organization's goals, individually and for our common society.

Marc Reinhardt
Head of Public Sector/
Healthcare at Capgemini



INTRODUCTION

As public sector leaders, we face a challenge. As our world becomes increasingly volatile, uncertain, complex, and ambiguous, we tend to despair in the face of the avalanche of technologies and acronyms that should be helping us, but often seem to be breaking our certainties and our established models of service provision.

However, the challenge we face does not have to be intractable. While the potential benefits of technology are sometimes clouded by unhelpful hyperbole, pioneering governments and public sector organizations are already modernizing architectures, embracing cloud services, and exploring emerging technologies, such as the internet of things, artificial intelligence, or virtual reality.

What's more, technology is here to stay; it is bound to shape our environment and the services we provide to citizens. Technology can be our best ally in helping to reduce exclusion, address sustainability-related concerns, and improve societies. Thus, taking a helicopter view over key technology trends provides us with a clear opportunity to see how we can use systems and data to reach our goals.

Our report, issued earlier this year, highlights our vision of how to create technology-driven change. It is underpinned by a clear, resonating leitmotiv: Being Like Water – showing how to build the agility, responsiveness, and resilience needed to successfully flow with whatever challenge or opportunity arises. From infrastructure and applications, via data and processes, all the way to user experience and collaboration, it shows the transformational opportunities offered by emerging technology trends in a format that is accessible, light-hearted, and easy-to-read.

But technology trends – as compelling and inspiring as they may be – mean very little without the right context. To this end, we are proud to introduce the second edition of TechnoVision for the Public Sector. Although it can be read separately, we certainly recommend you digest it in the good company of the original **TechnoVision 2022** report. Or why not get inspiration by also checking out **TechnoVision for Automotive**, **TechnoVision for Financial Services**, or **TechnoVision for Energy and Utilities**.

In the meantime, we hope you enjoy the 2nd edition of TechnoVision for the Public Sector. It is full of trends, cases, and stories to support many different technology-driven change initiatives – from the level of a local governmental unit, all the way up to society as a whole. It's always about the dialog. So, keep on talking!

Pascal Brier
Group Chief Innovation Officer,
Capgemini

BEING LIKE WATER

Sitting in his makeshift shed, the man wields his knife around a plastic bottle, forming the perfect water feeder for his allotment. "Waste not, want not," he whispers to himself in the quiet acknowledgement of a lifelong mantra to repurpose, reuse, and recycle.

In India, they call it "Jugaad": a flexible and pragmatic way of problem-solving, using limited resources in an innovative way. This frugal innovation approach – which may go by another name in different parts of the world – is now more relevant than ever, for many reasons.

We see the world straining its natural resources, no longer able to sustain our current levels of living and consumption. We must be more inventive with what we have, rather than spending too much of our scarce resources on energy-wasting, polluting, build-from-scratch activities.

Jugaad masters skillfully control their tools and materials. Part of their way of life, their chosen "technology" is always with them, always available, always ready to innovate. These masters have become one with their tools and materials, they are Jugaad.

Sounds like something we also need in today's world of digital technology and business.

For the turbulent year of 2021, we recognized the role technology played in dealing with the flurry of unpredictable events, challenges, and opportunities. We created the leitmotiv, "Be Like Water" inspired by martial artist movie star Bruce Lee and his most famous quote:

"Be like water making its way through cracks. Do not be assertive, but adjust to the object, and you shall find a way around or through it. If nothing within you stays rigid, outward things will disclose themselves. Empty your mind, be formless. Shapeless, like water. If you put water into a cup, it becomes the cup. You put water into a bottle, it becomes the bottle. You put it in a teapot, it becomes the teapot. Now, water can flow, or it can crash. Be water, my friend."
– Bruce Lee

This mix of effortlessly using whatever comes in handy to deal with the situation became a trademark of Lee. In TechnoVision, we iterated the importance of crafting technology strategies, architectures, and solutions that are shapeless and formless, yet always flowing. It was a plea for agility, adaptivity, responsiveness, creativity, and resilience, all enabled by technology.

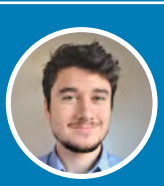
This year, however, aspiring to be like water is no longer enough. It is time to extend the adjective far beyond the realms of the vessel in which it is held. It is time to become our own Jugaad master – to walk the talk. It is time for actively "Being Like Water."

In **Capgemini's Digital Mastery research**, we see how organizations are building more digital and leadership capabilities – two crucial facets of a thriving Technology Business. They are also addressing culture – another success factor – and promoting the exploration of new, innovative technologies and platforms. Yet, while organizations focus more on upskilling employees than ever before, the increase is much less significant in soft skills areas, such as emotional intelligence, adaptability, and collaboration.

If we indeed acknowledge that every business is a Technology Business, then technology can no longer be kept within the walled garden of centralized IT, or whatever other sub-construct it is delegated to. Technology needs to be internalized, embraced, and utilized throughout the organization, regardless of business unit, activity, or individual role.

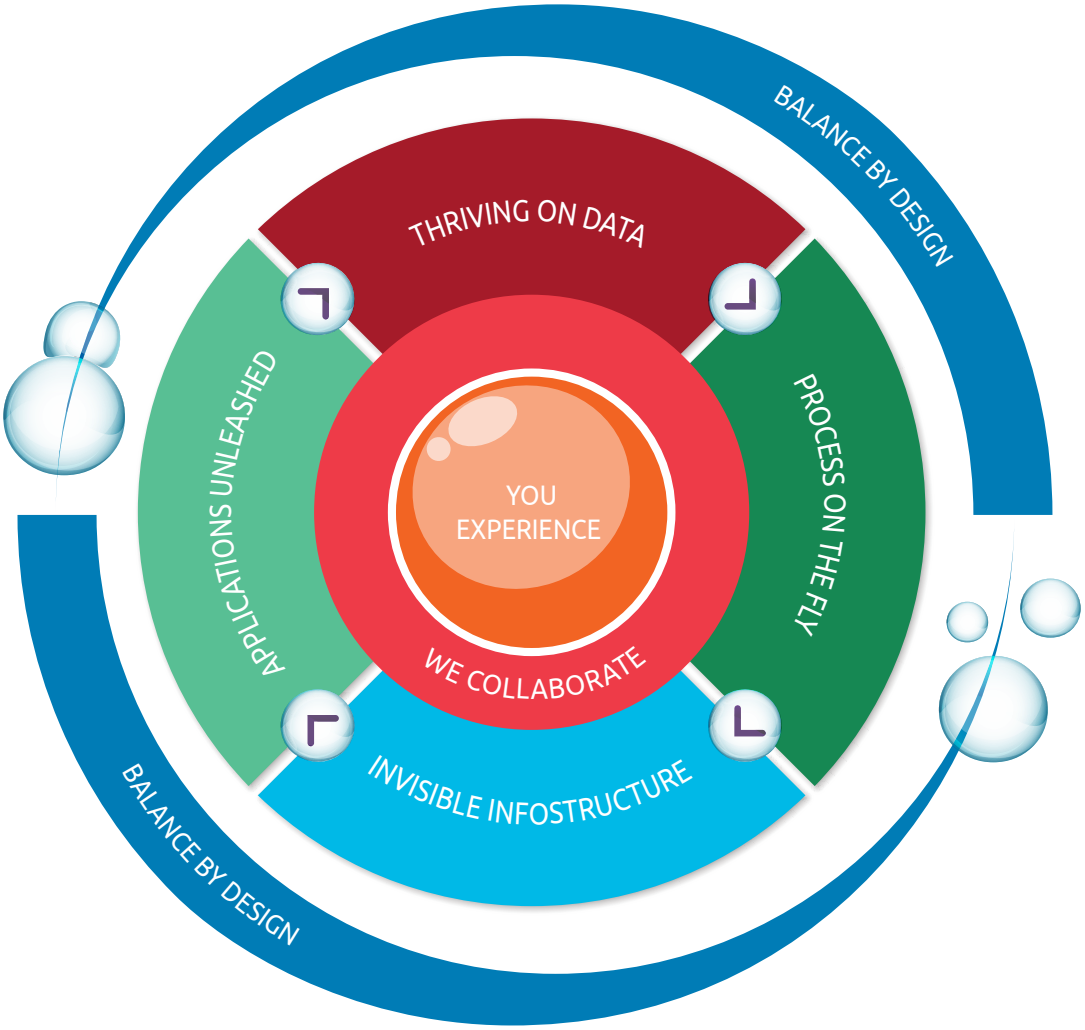
To aspire is no longer enough. It is vital for organizations to upskill scarce talent, embrace IT, and use it to deliver on their core objectives.

Gunnar Menzel
Chief Technology and Innovation Officer
Global Public Sector



Pierre-Adrien Hanania
Global Public Sector
Chief-of-Staff

OVERVIEW OF TECHNOVISION



TechnoVision categorizes technology trends into six well-defined containers, offering a snapshot of innovation from different perspectives (the "what") – ranging from user experience and collaboration, via data and process automation, all the way to infrastructure and applications. A seventh container offers a series of overarching design principles to successfully apply to the trends and create transformational impact (the "how"). These principles help build a sharp mindset, ready for any portfolio, program, project, architecture, innovation initiative, or idea.

Those familiar with earlier versions of TechnoVision will notice that we have discontinued the framework picture we have been using for years, which to some – unintentionally – suggested a sequential transformation from the more systems-orientated (infrastructure and applications) to the human-centered side (user experience and collaboration). Others thought they saw an architectural diagram.

To stay true to one of the key themes of this year's edition, we upcycled a somewhat older framework: a holistic, circular version, firmly placing "You Experience" and "We Collaborate" at the heart of the technology-driven exchange. This core foundation is surrounded by the more functional containers – Thriving on Data, Process on the Fly, Applications Unleashed, and Invisible Infostructure. All wrapped up with Balance by Design, as the overarching container to be considered while working with the others.

The 37 building blocks are all described in the original 2022 core document through one-page summaries. These are designed to be crisp and to the point on the one hand yet appetizing enough for further study through their links and case stories. Each building block contains an elevator pitch to briefly describe the trend. Then comes the "what" (a slightly more elaborate description), the "use" (actual use cases), the "impact" (potential business effect of the trend) and "tech"

(links to leading technology solutions and other relevant information).

The seven Balance by Design principles are also introduced through an elevator pitch, but then shaped into something much more tangible. First, outlined with a clear definition, the "why" quickly follows, discussing the purpose and benefit of adopting it. Second comes what is needed to put the principle into practice, before third, the simple measurements required to track the principle in business.

We recommend you navigate this second edition of TechnoVision for the Public Sector alongside the original TechnoVision 2022 document. This comes in handy if you want to know more about a specific trend; each page contains a link to the original building block on the web, so that you can easily jump back and forth.

Public sector use cases are crucial in this report because they provide the examples and the inspiration needed to move ahead and apply the TechnoVision trends. On each trend page, two cases are featured: one in which Capgemini has been involved, and one external, openly-published case. Each case is described in the same flow, staying true to our Be Like Water theme:

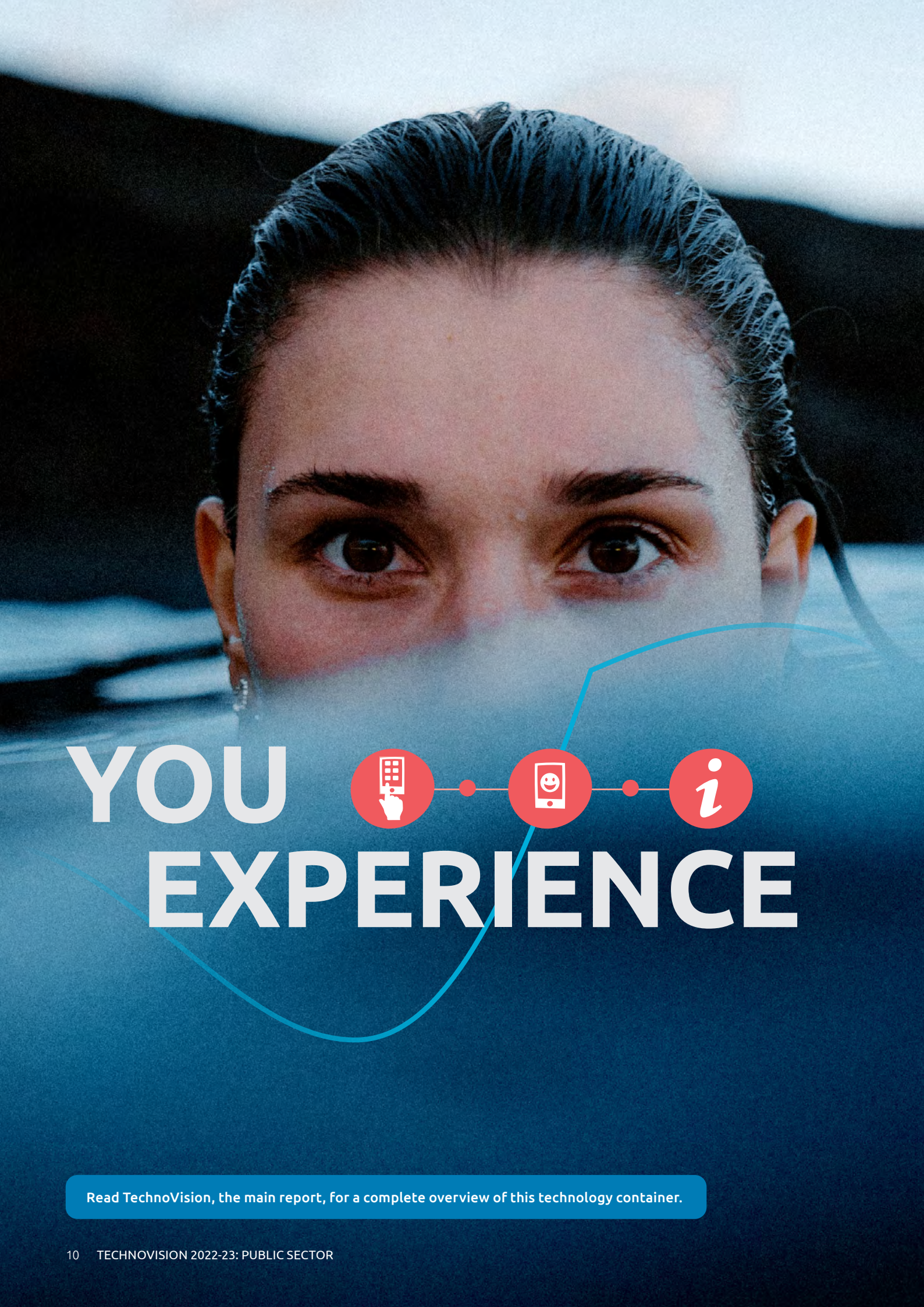
- "The Storm" describes the challenge
- "The Wave" addresses the way the trend has been applied to deal with the challenge
- "The Surf" outlines the business impact created

The trend pages are preceded by their container pages, in which an overview is given of the entire technology area and its impact on the public sector.

Our "experts in residence" had no problems whatsoever in finding cases. In fact, they found so many, that cruel, painful choices had to be made to fit the format. Each expert is prominently included on the trend page, hence do not hesitate to reach out to them if you are interested in more cases – they will gladly accommodate you.

Want even more?

If you still possess an unabated appetite for more, look out for posts and articles from our community of TechnoVision experts about your favorite 37 building blocks. Or, if you are lucky enough to run into the colorful TechnoVision cardboard boxes, scan the QR code on each block to take you directly to the relevant materials. You might even get your hands on one of these unique TechnoVision card decks. We also invite you to join any virtual session or look further into applying TechnoVision, to dive deeper with us. Come on in, the water's just fine!



Read TechnoVision, the main report, for a complete overview of this technology container.

EXPERIENCE²

Embracing uncertainty is one of the key aspects of designing new experiences that provide habit-changing signature moments. With each new technology, the possibilities for interaction grow, as do the expectations of users. Understanding these expectations in real time, predicting the users' intentions and their hidden desires are key for what we call Experience². It has become easier than ever to create hyper-personalized experiences by using the latest development in real time data, smart algorithms, intelligent automation, IoT networks and the emerging immersive technologies.

Governments can make use of this evolution by creating their own version of Experience². Immersive technologies like virtual reality (VR) or the metaverse can deliver a physical experience that helps overcome real-life limitations. It might be training citizens riding their bikes through heavy traffic and collecting real behavior data to improve the planning of future street layouts. Or it could be helping children overcome the limitations of the classroom by simulating different nature environments and letting them explore to form a new kind of environmental literacy.

Like brand loyalty, citizens will value the immersive experiences offered by their public service providers. They'll feel at the center of an experience perceived as exclusively designed for them and, in turn, will provide deep insights into their needs and intentions.

Florian Bemm
Expert in Residence,
Germany

Internal Use Case:

#MyHelsinki – Helping people find the best of Helsinki

City of Helsinki (Finland)

The Storm: Although Helsinki has much to offer tourists, the city lacks international prominence compared to neighboring countries. In fact, it was proving difficult for overseas visitors to find the best and hidden spots besides the well-known attractions.

The Wave: The city of Helsinki partnered with Idean, part of Capgemini Invent, to envision an app to help people experience the best of the city. One of the key features of the MyHelsinki App is MyHelsinki Lists, offering a visual map of favorite places to be created and shared by anyone.

The Surf: The success of the local guide led to a 19% increase in tourism in six months. #MyHelsinki was also tagged over 150-thousand times in social media and the website experienced a 1,935% growth in site visits. A mini program, helping to plan the full journey of a visitor's holiday, was created especially for non-English speakers.

External Use Case:

Researchers test virtual reality Adaptive Flight Training Study (2018)

U.S. defence organization (Air Force)

The Storm: Flight training is time-consuming and resource heavy. An adaptive flight training study at Columbus Air Force Base aimed to find out if a VR environment would help adults learn at or above the rates they were currently learning.

The Wave: The Air Force's advancement in training and education through VR: The three test groups flew four simulations; the first simulated flight set the baseline so the data could be compared to the other three flights. The task was to fly a basic sortie around Columbus Air Force Base and land safely.

The Surf: The virtual reality environment helped the flying students learn more effectively and at a faster rate than the traditional methods.

ME, MYSELF AND MY METAVERSE

The next generation of the internet is expected as a virtual world that augments real life and blurs the border between virtual and physical worlds. Seemingly boundless like the ocean, the metaverse is accessible by anyone, anytime, anywhere and on any device. It offers realistic embodiment, a sense of presence, space, and emotion; everything that was lacking in the legacy, flat, 2D experiences. Consequently, the platform could create a profound impact on the way we live, work, and collaborate.

The public sector is no exception in this regard. Due to its water-like, fluid structure, the virtual world easily adapts to sector-specific needs. Detached from physical barriers, it enables citizens to virtually interact with public authorities. The platform offers enhanced user experience and customer service, which strengthen the relationship between citizens and public organizations.

Today only a few public organizations are currently planning or using the platform[1]. However, accelerated by recent technology advancements, mainstream use requires the metaverse ecosystem to collectively assess critical challenges, including interoperability, being hack-proof, privacy, ethics, and societal concerns.

Etienne Grass
Expert in Residence,
France

Internal Use Case:

Meet-up Metaverse – PoC by AIE Brazil (2021)

Educational stakeholders

The Storm: Due to the Covid-19 pandemic, students weren't able to interact with learning materials in the classroom.

The Wave: Together with educational stakeholders in Brazil, Capgemini's Applied Innovation Exchange developed a Proof of Concept to show the potential of the metaverse in an educational context. Thus, the metaverse represents the center of education, where the student's journey can be created and customized by integrating the entire educational ecosystem.

The Surf: Enhanced learning experience through virtually visiting the academic institution, forming study groups, and interacting with learning materials.

External Use Case:

South Korea's metaverse ecosystem (2022)

South Korea's government (Ministry of Science and ICT)

The Storm: Currently, South Korean citizens cannot deal with civil complaints and consultations virtually. Even during the pandemic, they have spent a lot of time visiting authorities in person, which also makes it more difficult for people with physical disabilities to use public services.

The Wave: By 2023, Seoul wants to create a metaverse where citizens can make use of public services virtually, visit a virtual city hall as avatars by using VR (digital twin) and attend major festivals.

The Surf: South Korea's metaverse has the potential to bring many advantages to the country, including avoiding the need for citizens to physically visit authorities, potentially creating 1.5 million jobs, and producing over 40,000 professionals that specialize in the nascent space.

1 As an example, Seoul announced that it'll spend $3.3 billion (3.9 billion Won) by 2030 to become a metaverse city.

NO FRICTION

Using smart technologies, public sector services can become personal, seamless, and autonomous to the extent that when desired they can blend into the background.

Utilizing the plethora of data available to organizations, individual preferences, location services, and IoT, their services become aware of your personal environment and can deliver highly contextualized user experiences, if you wish and ask for it.

Trust that "the authority" uses your data ethically is critical to large scale user adoption. Transparency about the sources of data, automation techniques and AI's use are key to user consent and then building and maintaining their trust.

These data-powered frictionless user experiences are wholly dependent on the fluid exchange of data – between the authority, the user, and the ecosystem they sit in. To deliver an optimized service, equal levels of smart data analytics are required within "the authority." The interplay between the frictionless user experience, the service provider's analytics, and continuous product delivery – all with a strong ethical backbone – is what will differentiate good user experiences from those with No Friction!

Dr. Michael Osborne
Expert in Residence,
UK

Internal Use Case:

STEP: Predicting Bed Availability with AI

Regional health agency in France

The Storm: The uncertainty of bed capacity challenges hospitals and health authorities, both on a medical and logistic level. Striking the right balance between scheduled and (urgent) unscheduled care during medical bottlenecks is key to saving lives.

The Wave: The Agence Régionale de Santé (ARS) Île-de-France partnered with Capgemini Invent to apply AI to monitor and anticipate bed capacity across the region – also featuring a prediction feature to proactively steer the health ship through the storm.

The Surf: The project's analytics capacities made it possible to make projections based on predictions of epidemiological models in order to maintain a minimum of available beds. Such scenarios for incoming flows help to avoid emergency overcrowding and allocate scarce resources more efficiently to manage patients' stays and support. The approach also drives better decision making and foresees the impact of new confinement strategies.

External Use Case:

UbiGo: Launch of MaaS travel service in Stockholm

City of Stockholm

The Storm: Mobility and sustainability are major global challenges. Given the continued trend of urbanization and increased demand for transportation, cities must find solutions for related issues of emissions, noise and congestion.

The Wave: The city of Stockholm launched a New Mobility-as-a-Service (MaaS) project introducing UbiGo, an app that combines transport options from distinct providers.

The Surf: Reducing the need for a private car has immediate effects on the environment contributing to a move towards sustainable mobility. For its commitment to sustainability, UbiGo also receives funding from the EU Horizon 2020 CIVITAS ECCENTRIC program. Furthermore, it has a positive impact on the traveler's experience. After a successful pilot in Gothenburg and rollout in Stockholm, the first ever deployment of MaaS, the share of users that were very satisfied with their overall transport experience increased from 17 to 50%.

I FEEL FOR YOU

AI can automate and accelerate many processes. We all know that. But sometimes, we tend to generalize and associate bots or AI only with customer-oriented processes such as sales or support. The truth is that these technologies can help us in a tailor-made way, with specific attention not only on operational efficiency, but also human specific contexts and reactions. With emotional AI, feelings and situations merge with the process and the search for a suitable output.

Who doesn't struggle with bureaucratic processes when dealing with governmental services? It can be a real pain, and get you stuck, right? AuroraAI helps in proactively acknowledging difficulties and solving them – together with the citizen. But intelligence also can become aware of adjusting interactions to the most vulnerable in our society, such as Botti, a chatbot offering children a safe space to talk in highly difficult situations.

We'll keep our fingers crossed for you AI, so we can observe many more such initiatives in the future. Initiatives that will make our lives easier, safer, or simply happier.

Aleksandra Domagala
Expert in Residence, Poland

Internal Use Case:

Botti – Chatbot for Children

Capgemini-supported proof of concept

The Storm: Most child abuse victims are between six and thirteen years old. At this age, children often lack the capacity and courage to find and contact appropriate institutions on their own. A sense of shame also often means that they are too inhibited to speak to someone able to help.

The Wave: Botti is a prototype built within the context of the German WirVsVirus hackathon in 2020, allowing children to communicate anonymously and independently, regardless of geography or time. The chatbot asks progressive questions, adapting to the child's readiness to share information, and builds on how they feel.

The Surf: Given the lower inhibition threshold, children are encouraged to seek help at an earlier stage. Credited for its easy scalability and the mix between new technologies and a chatbot interface, the PoC won a prize at the #Wirfürschule hackathon.

External Use Case:

Towards a human-centric society with AuroraAI

Finnish Ministry of Finance

The Storm: The Finnish supply of government services is largely silo-like and driven by the needs of public authorities. Due to this, authorities may fail to deliver them in a timely manner to citizens or companies in different life or business-related circumstances and events.

The Wave: AuroraAI is a Finnish customer service model using AI to assist citizens accessing government services based on their needs, centered around selected life-events and business activities. AuroraAI will be fully available in 2022 and builds on a so-called snapshot of people's needs and the state of their well-being as citizens.

The Surf: The program promotes a human-centric, proactive society. For citizens, it offers personalized services and strengthens their ability to solve issues in difficult situations. Moreover, the program will enhance process efficiency and produce savings by improving the cost-efficiency of services.

MY OWN PRIVATE AVATAR

Digital assistants can act on behalf of citizens, patients, employees, or organizational entities. Avatars – our digital intermediaries – represent us and our individual needs with services and systems. Built on AI/ML and cloud models, intertwined with graphics, CGI, 3D and VR design tools, avatars can make our lives easier and more effective, provided they truly act as our digital twin.

The key is to maintain control of our avatar and reveal only as much of it as needed and consented. From a service provider's perspective, it will help to understand, engage, and interact with these avatars – to create signature moments for citizens. It can not only make our experiences better, but also help us maintain our sovereignty by standing up for our rights on our behalf; for example, consenting automatically to data uses we always approve, or pointing out any access to our data that is unusual. Use your tech buddy to keep control of your sovereignty to safely open up new tech possibilities.

Anne van Leeuwen
Expert in Residence,
Netherlands

Internal Use Case:

Ange Gardien: the first application of Digicare

Region of Nouvelle-Aquitaine (France)

The Storm: Patient pathways over time are a difficult challenge for health practitioners to cope with. While a more consistent following of the patient storyline is needed, the interaction with different profiles at different stages also needs to be ensured – especially for chronic disease that weigh heavily in the cost of health; only affecting 17% of people, but representing two thirds of the costs.

The Wave: Ange Gardien is the first application case of Digicare, the next-generation digital care pathway app for patient support on specific pathologies and treatments, backed by monitoring, educational, and recommendation features.

The Surf: The patient-centric solution accompanies patients throughout all stages of the treatment and care pathway, supporting all involved through the interface. Thanks to Ange Gardien, more than 1,000 patients benefited from an early diagnosis. Furthermore, the collected data is leveraged for medical research to help optimize the fight against chronic diseases.

External Use Case:

Alexa-like access to public services

Government of Estonia

The Storm: With all Estonian public services set to be available online, the government wanted to explore ways to improve citizen interaction and experience with government services, making make it less complex and rigid.

The Wave: The Estonian government worked on a project #KrattAI to enable citizens to interact with government departments and access services via virtual digital assistants of their choice. Following a citizen's voice request, the ensuing task is completed by an automated process relying on the interaction of AI applications from different departments.

The Surf: Citizens will be able to use their preferred interfaces to take care of government services, be it applying for a new passport or asking Siri to fill out taxes as well as to be reminded of upcoming expirations. In this respect, digital public services will be easier to use and accessible for everyone from any device, providing for an enhanced user experience level. One additional benefit is that no further interface is needed, as the solution leverages platforms that citizens use already.

WE COLLABORATE

Read TechnoVision, the main report, for a complete overview of this technology container.

FLUID WORKFORCE

A fluid workforce is not something most people would expect from the public sector, which is known for clear, hierarchical and long-term organization. But the need to get things done faster and the nature of the challenges have also shaken the fixed organizational setups of government agencies, and have let a number of fluid elements in!

The demographic challenge forces the public sector to look at intellectual capital as an asset that requires diversification, risk appetite, and ambitions. The "next normal" has added new dimensions to the complexity of choices to be made. While the backbone of civil servants by definition is less fluid, it should at least flow more freely between departments.

The need of government agencies to renew their workforce – tapping into the capabilities required to provide innovative services - is new and still feels strange but is a necessary step. Previously the only flexibility was sought - and not always found - through mega outsourcing deals. New ways of mission-oriented private sector collaboration are developing and are complemented by citizen crowdsourcing, innovation labs outside the agency organization and collaboration models with "GovTech" parties.

Cinzia Giulietti
Expert in Residence,
Italy

Internal Use Case:

HMRC rapidly develops digital service to support employers

HM Revenue and Customs, UK

The Storm: Due to COVID-19, HMRC had to work quickly to implement a solution that would allow employers across the country to furlough employees instead of separating themselves from them.

The Wave: Working together with agile and DevOps approaches, a digital service to support the Coronavirus Job Retention Scheme (CJRS) had to be developed in a very short timeframe. The solution provided a new digital service based on a microservice architecture on the digital platform, hosted in the cloud. The system collected information from employers and routed it to a risk and compliance process.

The Surf: While such an operation usually takes one year, the digital service was produced within four weeks. By the end of 2020, CJRS had assisted over 1.2 million employers and 9.9 million jobs, paid out claims worth over 46.4-billion GBP and processed over 4.5 million claims from employers.

External Use Case:

Shared service of hospitals

Canton of Vaud (Switzerland)

The Storm: To enable a resilient digitalization in hospitals, FHV Informatique chose a new IT tool to facilitate access to information, promoting collaboration between the responsible institutions with decentralized structures through the development of a new digital workplace.

The Wave: FHVI identified potential areas for improvement and evaluated them against 140 criteria. The Jalios solution applied a rich feature set, the ergonomics of its "out-of-the-box" implementation, scalability, and the comfortable publication and management of multi-site content and resources.

The Surf: As a result, 8,895 employees have simplified access to valuable information. While each institution gained autonomy in terms of managing its content and resources, sharing and collaboration on cross-cutting projects were stimulated.

THE TEAM IS THE CANVAS

As social human beings, we adapt our interactions and collaborations quickly to our circumstances. Creating together is an essential part of who we are and what we do, day in day out, and no crisis can stop that.

That applies even more to the public sector; although current governmental bodies often frown upon such "new work" models. Public services are for everyone, with inclusion and completeness of services as very important drivers. Public services are evolving into a composition of interactions between the citizen, business, and IT, who meet under the auspices of a collaborative spirit and mutual education. In a virtual or hybrid society, citizens, IT, and business use a virtual canvas, carefully selected to reach our goals, and work together. Highly integrated for a flow of ideas turning into tangible value, and encouraging creativity, connection, and inclusiveness, even when we are worlds apart.

Nia Roberts
Expert in Residence, UK

Internal Use Case:

DEON for a governmental workshop

Western European Central Government

The Storm: The central government task force wanted to host a workshop in which all ministries would participate and brainstorm. The format should be collaborative, with a key criterion being working on a shared platform in real time.

The Wave: Capgemini applied the collaborative platform of DEON, a visual collaboration platform, integrating all file formats in one canvas and allowing for a real-time editing of the space for over 30 participants from all ministerial departments.

The Surf: The application of visual collaboration tools enabled participants from different ministries to work on documents simultaneously in real time, storing their data safely on premises. The digitization of the process made follow-up actions easy and instinctive.

External Use Case:

India launches 3D product design software for students

Ministry of Education (India)

The Storm: 3D printing has become an integral part of 21st century innovation, so it's important to think about new types of collaborative opportunities where designers can work together to share ideas and specifications, and review each other's designs.

The Wave: CollabCAD is a collaborative, network and desktop CAD software system that provides a total solution for 3D product part design, 2D drawing and CAD data import and export.

The Surf: Interactions are greatly improved and the time frame for decisions is reduced. Collaboration facilitates rapid product visualization and dramatically reduces time. CollabCAD will help students from over 140 schools across the country, along with schools in the Middle East who can access it.

TAKEN BY TOKENS

A token is a digital asset, stored securely by using a blockchain technology – and tokens are key when it comes to increasing user experience. Today tokens are mostly known as crypto currencies, such as Bitcoin or Ether tokens. However, they can relate to anything, from votes, licenses, access rights, even to ownership of a song, a house, or any digital asset stored in the metaverse. Tokenization has the potential to transform public organizations, making transactions more efficient, secure, reliable, and accessible, allowing citizens to interact and transact with public sector organizations in a fluid and seamless way. It will create a new meaning of what we perceive as value. How? By making digital assets just as tangible and valuable as real-world assets.

Steffen Reidt
Expert in Residence, Germany

Internal Use Case:

[Emissions trading registry with distributed ledger technology]

The German Environment Agency

The Storm: The German Environment Agency (UBA) sought to better understand how an emission trading system built on distributed ledger technology (DLT) could help combat global warming. A feasibility study looked into the use of DLT in existing emissions trading registries.

The Wave: Based on the attributes of emissions trading, Capgemini and other project partners developed a draft for a DLT-based emissions trading register using the requirements evaluated, such as usability, performance, interoperability, and sustainability. Capgemini provided a rich set of expertise in carbon trading, registries, and private blockchain implementation.

The Surf: The insights generated by the project partners will support policymakers in informed decision making with regards the question of whether to remain with a traditional architecture or with a central relational database. As a specific type of DLT, blockchain technology can increase the decentralization and transparency of climate action. DLT is therefore useful for the implementation of the Paris Climate Agreement since this technology makes the implementation of the decentralized approach to climate change effective.

External Use Case:

[Industrial Blockchain – iBlockchain (2022)]

Federal Ministry of Education and Research (BMBF)

The Storm: Blockchain technologies are currently driving change in various markets and industries. Machines interact autonomously with each other and exchange valuable information. Ensuring data and process integrity is of particular importance here. In order to fully exploit the potential of blockchain technologies for industrial applications, there are still some challenges to be overcome.

The Wave: By analyzing and evaluating the technical and economic fundamentals, the team will be able to develop and implement blockchain solutions for industrial applications. The secure implementation of the interface between the data in the blockchain and the real world is particularly important, as is the development of secure and trustworthy hardware-based smart oracles. The results of the project will be implemented in demonstrators and evaluated in their technical implementation for industrial applications.

The Surf:

- High level of IT security
- Cost-effective, resource-efficient, scalable
- The project results will help to answer technological and economic questions

YOUR BUSINESS IS A MESH

Customer demand for seamless experiences across services has given rise to meshed, cross-industry business models. It introduces an era of co-opetition, as organizations reach beyond the boundaries of their own industry to develop new value propositions with ecosystem partners and startups. With the help of changing ecosystem-based business models, the public sector can drive unique administrative services and customer experiences by crossing the barriers of silos, industries, and regions. Not only that, but mesh collaboration could also be key to addressing joint sustainability goals. Exactly the rumble the public sector may be looking for.

Lisa Eckersley
Expert in Residence, UK

Internal Use Case:

[Project ADAMAS sets new standards in application development (2020)]

Bavarian Environment Agency (LfU)

The Storm: A discontinued technology at the Bavarian Environment Agency (LfU) made it necessary to update a number of specialist applications. The expiring support endangered an efficient, user-friendly, and long-term application operation.

The Wave: Working with the LfU on the ADAMAS project, Capgemini created a new platform that combines a modern, standardized architecture with an overall conceptual philosophy for the development of new specialist applications. The ADAMAS principle was successfully applied for all productive applications.

The Surf: Three individual solutions replaced their heterogeneous predecessors:

- A water utility inventory data collection solution
- A solution regarding the documentation requirement for contaminated sites and landfills
- A solution for recording substances that require documentation in accordance with radiation protection law

External Use Case:

[India's Open Credit Enablement Network (OCEN) (2022)]

State Bank of India

The Storm: The digital lending market in India is expected to grow to $100 billion by 2023. An untapped customer base of over 300 million Indians who have remained outside the formal credit market is a contributing factor in this growth. Current rails for the flow of capital into this untapped market are broken. Recently, digitized users have been increasingly generating a digital transaction history that can be used to inform and build trust with financial institutions. However, the availability of appropriately sized, priced, and timed credit products is still not optimized.

The Wave: IndiaStack brought the first paradigm shift in India's FinTech market. Its disruptive innovation offers open APIs as public digital infrastructure, such as UPI, BharatPay, BBPS, Aadhar, AEPS, eKYC, eSign, DigiLocker, FASTag, and GSTN platform.

The Surf:

- Cash flow loan to micro, small and medium enterprises (MSMEs) in five minutes from an app or even WhatsApp
- Bundling of account aggregator (AA) framework with OCEN APIs
- Future state to enable intra-day micro-loans for small merchants and even street vendors
- Consent-based access to verified information from multiple public and private data sources
- OCEN has acceptance across stakeholders. TSPs such as Setu and Apollo Finvest have already published APIs to integrate with OCEN
- Over 30 consumer-facing companies to become LSPs and adopt OCEN, including tax and legal filing apps, neobanks, kirana tech apps, khata apps, payment gateways, and AgriTech companies

IT'S ALL CONNECTED

IoT, AI, edge computing, and 5G connectivity are the enablers for technology-driven connected business innovation. These technologies are the real gamechangers for public sector organizations. Collecting and sharing data in real time and at high speed allows institutions to collaborate and even build real-time and accurate AI models based on fully immersed citizen and agency focused data. This enables accurate predictions that facilitate decision-making and speed up processes to further enhance the user experience. Public sector organizations should be seen as innovators, by designing and promoting IT in a sustainable way, creating and enabling a fully connected citizen to the public sector ecosystem. The technologies for a fully connected citizen experience are here – so, lets share, collaborate, and create.

Antoine Mercier
Expert in Residence, France

Internal Use Case:

Shaping the 5G network strategy for public safety

Network operator for public safety

The Storm: Mission critical communications are used by public safety bodies (police, fire services, ambulance crews, and more). A mobile network operator wanted to optimize its paging and dispatching network for all emergency and security services.

The Wave: To deploy the migration of users from its current network to a new hardened 4G/5G network in conformity with European initiatives and 3GPP/PPDR standards, the network operator and Capgemini developed a strategy to leverage wholesale, mobile virtual network operator (MVNO), core and service network evolutions, IoT, and multi-access edge computing.

The Surf: The project strives to create a detailed business and financial plan for the next five years, with a detailed technical LTE/5G network architecture using RAN sharing configuration. The new target operational model will assess staffing needs and a concrete investment plan.

External Use Case:

UK's first remote ultrasound over a public 5G network

NHS Birmingham (United Kingdom)

The Storm: Ultrasound examination is the second most common diagnostic test provided by the UK's National Health Service (NHS). The technology is expected to speed up diagnosis in cases where time matters.

The Wave: The South Central Ambulance NHS Foundation Trust introduced a 5G-connected diagnostic ambulance. The technology facilitates the remote assessment and diagnosis of patients by instructing the paramedic to look in a certain direction or transferring control signals over the 5G live network to a "haptic" glove worn by the medical assistant.

The Surf: The remote diagnosis represents an opportunity to determine a suitable care pathway without the patient necessarily having to see a physician in the hospital. It also decreases the number of potential outpatients, as well as ambulance and emergency (A&E) department visits.

THRIVING ON DATA

Read TechnoVision, the main report, for a complete overview of this technology container.

DATA SHARING IS CARING

Participating, collaborating, or even leading in data ecosystems gives you and the other participants more value from data – creating new connected services and skillsets, boosting the organization's performance, and contributing to a better society with an enhanced citizen engagement.

What's not to like about realizing the true value of data by sharing and leveraging it in all kinds of fields, whether for earth observation, unemployment reduction, or homecare symptom assessment? A data ecosystem thrives on the art of shared data, and a collaborative culture nurtured by the quest to get the insights behind that data you don't own or have. Done in many ways and far safer than ever before, the next generation of data cloud platforms enables trusted data collaboration without ever giving up on data privacy, security, and ownership. Data evolves from a static, anxiously guarded asset to a highly valued item, continuously expanding an organization's impact scope. So, press that forward button and share the message!

Nathalie Simon
Expert in Residence, France

Internal Use Case:

Spanish hospitals use privacy-preserving artificial intelligence (2021)

Hospital Ramón y Cajal and Hospital 12 de Octubre in Madrid and Hospital Sant Pau in Barcelona

The Storm: Analyzing a huge number of images with subtle findings requires time, training, and experience. For three Spanish hospitals, artificial intelligence (AI) was viewed as a highly suitable tool for this purpose to improve Covid-19 diagnosis with chest x-rays.

The Surf: Capgemini developed a federated learning platform based on sharing AI models trained with image data (hardware enhanced security).

The Wave: The platform allows the creation of a global diagnostic model that significantly improves local versions, especially benefiting healthcare facilities with less diagnostic experience. The accuracy in the diagnosis of Covid-19 in a research study was 89% for the global model, while the previous best of the local versions reached only 71% accuracy.

External Use Case:

Spaces4Cities (2021)

Gaia-X Hub Germany

The Storm: The global population is growing, climate change is accelerating, and social and demographic developments require answers. By 2030, 70% of the world's population will live in cities.

The Surf: Satellite-based earth observation provides an important information basis for new solutions for sustainable urban and spatial development. Due to freely available satellite data, it is, in theory, possible to capture the dynamics of global urbanization.

The Wave:

- Supporting the linking of different cloud participants within a common ecosystem in which a secure and standardized exchange of (European) data, algorithms, functionalities, and results can take place
- Synergistic evaluation in order to break down data silos and offer tailor-made information for urban development and/or for new digital products and business models

POWER TO THE PEOPLE

Knowledge is power! And access to knowledge, in particular direct access to data-derived insights for the "many," not only for the very "few" power users is more important than ever. We have seen citizens gather data themselves if the administration does not provide it, for example on train delays.

The data-powered revolution changes its center of gravity from a dominant core of main data publishers to a decentralized network of data publishers and users, with governments losing the monopoly to "capture the world" in data.

In this new data ecosystem, the role of the citizen is shifting from that of a passive consumer of statistics to a "hands-on" data and insights producer. Agencies need to allow easy access to their data. This is about leveraging the societal power of people directly involved in technology-driven transformation and developing a new "data crowd intelligence." Whether it be for parliamentary debates, patient journeys, or administrative processes, individuals can and need to make the sense of the data that works for them.

People become pivotal to the ecosystem, being in the driving seat of data-powered change. Power to the People right on, spot on!

Cosmina Radu
Expert in Residence, Germany

Internal Use Case:

OnDijon: Connecting man and machine for the Smart City of Dijon

The Dijon metropole (France)

The Storm: With the vision of creating a smart city network spanning its 23 municipalities, the Dijon metropole wanted to tap into the latest digital technology to connect its urban equipment, services, and citizens to improve the attractiveness and quality of life in the city.

The Wave: Together with a consortium led by Capgemini, the Dijon metropole established a central command to centralize data, connecting to their citizens and their queries at all times. A mobile application allowed the user to communicate easily with the center.

The Surf: The data is used to simplify and improve the coordination of service needs, maintenance works, and emergency responses – for instance, citizens can provide the city with crucial information about incidents in real time via the mobile app. This ensures continuous communication with citizens and improves the city's responsiveness and coordination.

The launch of the new platform also led to a 40% cost reduction for their services, while 630 calls concerning citizen requests are processed daily.

External Use Case:

Active citizenship and innovative technology driving Bristol's approach to citizen sensing

Bristol City Council (UK)

The Storm: Damp homes are a major problem in Bristol, severely impacting people's health and wellbeing, especially for low-income households.

The Wave: To tackle this problem, the Damp-Busters pilot project was initiated in Bristol. A community-led project that aims to tackle the issue with a mix of sensing technology and open-source resources. The prototype, a frog-shaped sensor, gathers temperature and humidity data to better understand damp conditions.

The Surf: With its holistic approach and by using citizen-generated data, the project empowers city dwellers to become data producers, and become active in solving their city's challenges. The project was developed as part of the European REPLICATE Project, an initiative that brings a new take to active citizenship and the use of technology for social good. The insights of the Bristol Approach have already been applied to other projects across Europe.

DATA APART TOGETHER

The best insights come from bringing together the best and richest data sources. To be able to compete in a global data society, we need access to data that is traditionally apart, split between government, business, and citizens.

When it comes to personal and confidential data in particular, conflict arises between exploiting data to innovate and preserving the rights and will of people and companies. For too long, locking data away was considered the only way to protect it. But government data strategies clearly plan to enable, as much as possible, a free, responsible, and secure flow of data to provide better services and experiences to citizens and businesses.

Once this is ensured, the value potential of using and integrating data from multiple sources is far greater than the sum of its parts.

We are at the beginning of a generational change in practices and technology, similar to what we experienced in the 2000s with big data. Today however, modern data sharing opportunities are not just centered on technology, they encompass business and federated collaboration models, legal frameworks, while seeing citizens as active participants.

Gianfranco Cecconi
Expert in Residence, Netherlands

Internal Use Case:

A health data hub for France

French government

The Storm: Discovering use cases for AI in the health sector is one of France's national strategy priorities, defined in 2018. The foundation of successful AI is data, yet health data is fragmented and not easy to access, given its sensitive nature

The Wave: The Health Data Hub provides a secure platform with easy access to health data, which enables researchers to develop new innovative usage, complying with legal regulations and citizens' rights.

The Surf: Ultimately, it enhances the quality of treatment and care, paving the way for new initiatives and solutions to cure specific diseases. In 2020, Capgemini supported 25 projects that will that will help to improve patient diagnoses through computer vision, enhancing the way patients are treated through personalized recommendations.

External Use Case:

Building a rail freight data hub

Association of German Transport Companies (VDV)

The Storm: The German rail freight transport industry is at risk of losing ground in intermodal competition. Although various individual applications and data streams exist, there is no holistic approach of standardized or coordinated business processes, and the shared use of data pools.

The Wave: The Federal Ministry of Transport and Mobility (BMVI) promotes a project to establish a "Rail Freight Data Hub" (RFDH).

The Surf: A common data platform advances the digitization of the industry, strengthening the competitive position of rail-bound freight transport by accelerating processes, minimizing error rates, and increasing service quality and customer satisfaction. Moreover, the project is expected to have paid for itself in the second year by saving 27 million euros

ERA OF ALGORITHMS

The twenty-first century has witnessed governments worldwide intensively fortifying their technology capabilities to increase speed, efficacy, effectiveness, and optimization in delivering public services at scale. Artificial intelligence (AI) and data form the very nucleus of this revolution.

From education to water, law and order to healthcare, climate to econometrics, income equity to force majeure simulations, AI today is a game changer in uplifting communities globally through predictive and prescriptive data-driven solutions. By digging deep into what data reveals, public services can reimagine their processes, better predicting occurrences and augmenting their decision-making processes with AI-driven suggestions or even digital twins of cities or policy fields.

For instance, within healthcare, bot assisted diagnosis, drug effectiveness and pharmacovigilance, drug and molecule discovery, and pandemic management, all rely on lightning-fast yet high-precision predictions and recommendations. Our two showcased solutions illustrate the clear and tangible benefits AI brings.

Pierre-Adrien Hanania
Expert in Residence, France

Internal Use Case:

[AI for better discharge decisions]

Region Västra Götaland (Sweden)

The Storm: Doctors working in closed psychiatric wards needed to manually prioritize patients for discharge while limiting the risk of readmittance. To determine decision-making prerequisites, doctors needed to consider numerous variables in a short time, such as care history, diagnoses, medication, and patient demographics.

The Wave: Capgemini helped the Västra Götaland Region (VGR) to develop an analytical model built on patient medical data, prescriptions, demographics, and medical best practices to prioritize which patients to discharge first.

The Surf: The solution achieved a 40% precision rate when predicting relapse within 14 days of release, and correctly identified 50% of relapse patients. By applying machine learning, the organization also gained more effective guidance for generating insights into factors of a patient's risk of readmission.

External Use Case:

[Helping military doctors with predictive cancer diagnoses]

The US Defense Innovation Unit (DIU)

The Storm: It is estimated that, within the United States, 5% of outpatient diagnoses are erroneous, translating to an annual misdiagnosis of 12 million patients. False or late diagnosis can result in serious injury or even death.

The Wave: The Defense Innovation Unit (DIU) partnered with Google Cloud to develop an AI-enabled digital pathology solution to help military doctors with predictive cancer diagnoses.

The Surf: AI and machine learning sped up and enhanced the accuracy of cancer diagnosis in the earlier stages, therefore improving not only the diagnostic capability of healthcare practitioners but also contributing to the patient's timely treatment of cancer. Personal data was anonymized in the process to respect compliance rules.

CREATIVE MACHINE

For most of us, artificial intelligence (AI) is still mainly associated with hard mathematical optimizations and less with the artistic act of creation. However, lately, this aspect is getting more and more traction.

We have come a long way from style transfer and caption generation. AI can now generate images from text descriptions, full articles from text prompts, paint pictures, compose music, and even develop source code, allowing us to support or even automate a whole new set of tasks.

First application examples of generative adversarial network (GAN) methods in the public sector are starting to appear, with healthcare at the forefront of these efforts.

All this new potential should come – by default – with a strong ethics-inside chip, to build trust and avoid its demonization. Once this is secured, imagine all the potential of an AI system that merges data creation with intelligence creation, paving the way towards tailormade insights – for job matching, education, or city experiences. Wait for it: AI is getting inspired!

Daniel Kühlwein
Expert in Residence,
Germany

Internal Use Case:

Using GAN to synthetize patient data and mitigate compliance risk

Försäkringskassan (Sweden)

The Storm: The organization could not use its data due to privacy and compliance risks. Therefore, a GDPR-compliant solution was needed to handle patient data. Yet, data scarcity was a problem in terms of applying AI.

The Wave: Using Sogeti's ADA solution, a combination of deep learning methods, a sample of the real data is fed into the model and the output of the model is a generated synthetic dataset that is very similar to the original data in terms of statistical similarity and distribution.

The Surf: The organization is now able to generate enough production data for testing and accelerate QA. Medical data is generated, which can then be used to leverage insights on patient situations, while GDPR compliance is secured with sensitive patient data being synthesized.

External Use Case:

GAN-based detection of M. Tuberculosis pathogens

Various researchers

The Storm: The early detection of diseases, such as Mycobacterium (M.) Tuberculosis, increases the chances for successful treatment. AI and computer vision can significantly help to speed up the diagnosis and reduce response time. However, with little labeled image data available, the manual labeling of images required for the creation of training data for AI models was time-consuming.

The Wave: In combination with advanced computer vision, Generative Adversarial Network (GAN) analysis was used to gather labeled training data for recognizing objects with minimal effort in a short time. The focus was on responsive alerting to address threats through the use of low resources and offline mobile computing applications. The performance score of these models ranges for M. Tuberculosis from 0.84 – 0.93.

The Surf: With the use of GAN, open-source data can be made more adaptive and robust, saving thousands of man-hours that can be used for fine-grained diagnostics.

PROCESS ON THE FLY

Read TechnoVision, the main report, for a complete overview of this technology container.

PROCESS IS MINE MINE MINE

Using digital twins to inject continuous process innovation, making it the envy of the entire flock.

Digital transformation in government is tough. Each department has its own software applications from vendors specializing in the department's particular field: law enforcement, inspections, immigration, recreation, treasury, and a multitude of others. These disparate systems typically emulate the same processes that have been in place for decades, with change agents relying on the vendors that maintain the processes, operating as parallel canals into an ocean.

But what if you could prototype change in a risk-free environment, to create a single stream? How? By repurposing an existing technology that has been around for a while. Applying a digital twin to a business process enables entirely new ways to digitize and reimagine how a Technology Business can identify, measure, and prioritize new ideas for process improvements. And when coupled with feedback from the operational side of the business, it really does forge a new river of continuous, enviable process innovation. You'll be ready for whatever change comes your way, so you can just keep swimming.

Doug Petroshius
Expert in Residence, US

Internal Use Case:

[Process mining for faster immigration administration (2020)]

Norwegian Directorate for Immigration (UDI)

The Storm: The UDI's processes can be long and stressful for all involved, so the agency made the pursuit of the most efficient processing of asylum applications its continuing mission.

The Wave: Working with Celonis process mining software, the UDI and Capgemini established a data model based on digital traces from the UDI's asylum case management system.

The Surf: The UDI and Capgemini demonstrated that there was a significant opportunity for process mining to deliver substantial improvements to asylum application processes. The top three use cases alone demonstrated potential annual business value for the UDI of more than 20 million NOK.

External Use Case:

[MOD selects Improbable to provide digital twin network (2021)]

UK Ministry of Defence

The Storm: The Defence Digital organization was established to bring together and replace several organizations, enabling users to enhance service operations, perform network upgrades and management, manage complex procurement and enhance network resilience.

The Wave: The next-generation communication network digital twin helps Defence Digital to operate its complex technical infrastructure. The digital twin uses a single synthetic environment (SSE) platform, which was developed by Improbable in partnership with Strategic Command.

The Surf: The MOD is able to employ game-changing and cutting-edge technologies to support the delivery of the Digital Backbone. The contract builds on and leverages the successful innovation efforts of Defence Digital, Strategic Command, and industry partners.

ROCK, ROBOT ROCK

Throughout the last decade, the private sector has come to leverage robotic process automation (RPA) extensively, moving from pure work augmentation to customer-centric application integrating platforms.

Due to the increasing expectations of citizens on digitization and the parallel need to do more (new laws and regulations) with less (demographic change), the public sector is now exploring RPA as a short- and mid-term solution to its specific needs. Routine tasks are being automated, costs are being reduced, and processes are being structured in a way that eliminates repetitive manual effort. The robots can even observe the human operators in their daily job and – with the magic of machine learning – at some point, even do it themselves.

If applied appropriately, it can be the augmented workforce governments are aiming at. For the good of the citizen and the public servant, create your own robots and start delivering!

Stefan Burghardt
Expert in Residence,
Germany

Internal Use Case:

Robotics function for improving customer service and job satisfaction

HM Revenue and Customs, UK

The Storm: Many agencies use old, outdated IT systems that require employees to use multiple systems to complete a task. This is time-consuming and can lead to high error rates.

The Wave: HMRC used Robotic Process Automation (RPA) to automate time-consuming clerical tasks, and link digital services and back-office systems for end-to-end processing, without significant IT development effort.

The Surf: Using RPA, HMRC reduced processing costs on some services by around 80% and reduced handling times for some calls by up to 40%. Dashboards gave advisers quicker access to the information they needed to answer calls, cutting some call times by up to two minutes.

External Use Case:

General Services Administration (GSA) leads the growth of automation projects

US federal agencies

The Storm: Federal agency employees typically spend a lot of time on trivial tasks, leaving limited capacity for more complex and intellectual work such as analysis, technical issues, or customer service delivery.

The Wave: The RPA Community of Practice (CoP) is a government-wide measure administrated by the US General Services Administration (GSA) and Technology Transformation Services (TTS) program offices. It enables cooperation and problem solving among federal agencies interested in realizing RPA. Several of those agencies implemented automation to cope with administration bottlenecks.

The Surf: The various initiatives have proven to be very successful in achieving a better citizen experience, minimal error rates, and better management capabilities. In 2021, the GSA has saved approximately 50,000 labor hours through automation, while a CoP report found a 110% increase in deployed automations between 2019 and 2020.

SILO BUSTERS

Silos in authorities or departments prevent progress and innovation. Breaking down silos by adding flexible process layers instead of breaking down or rebuilding already established structures is the way forward. Certain structures are so deeply embedded in public administration, making it virtually impossible to break or reshape silos. And rebuilding core systems can be complex, risky, and initially expensive for many public service organizations – both in terms of the initial investment of money and scarce natural and human resources. How about a proper upcycling instead? Technologies that automate public sector processes connect existing systems without interfering with them. They bring obvious, immediate benefits to the business while buying more time to reorganize and open up the underlying systems. Pragmatic processes in action. There is nothing supernatural about this.

Priya Ganesh
Expert in Residence, US

Internal Use Case:

RPA supports prefecture's administrative work (2021)

Ibaraki Prefectural Office (Japan)

The Storm: Ibaraki Prefecture, responsible for 2.8 million citizens, struggled to maintain the sophistication and diversification required to support its citizens.

The Wave: Ibaraki Prefecture and Capgemini implemented UiPath to automate the input of data and information into the existing system while improving the associated processes. 7,000 staff members participated in project sessions.

The Surf: By introducing robotic process automation (RPA) technology into 20 targeted distinct administration, education, and police operations, the time involved in these processes was reduced by 35,000 hours per year and improved the employee and citizen experience. A mix of RPA and AI-based optical character recognition (OCR) made it possible to reduce the payment processing time of more than 10,000 handwritten applications from 12 minutes down to two minutes per case.

External Use Case:

Transforming a legacy planning system (2019)

New South Wales Department of Planning, Industry, and Environment (DPIE)

The Storm: The DPIE provides a range of services related to planning, zoning, building and conservation. It was using 15 systems, many custom apps and some paper-based processes that were costly and required a high level of effort and resources to remain fully operational.

The Wave: The application process has been digitized and integrated into one single digital platform with Pega. This offers a seamless alternative to the siloed structure of manual processes that the organization was challenged by, with processes that could only be conducted in person and during business hours.

The Surf: Over 2,000 development applications have been submitted through the ePlanning Online DA service since December 2018. Using the new system reduced application determination times by more than 50%.

CAN'T TOUCH THIS

Today, too many routine processes and decisions still go through too many hands of civil servants. Where there is no room to weigh options on a decision and this decision is bound by clear rules to clear outcomes, the value add of the human is limited. Often, it is only an emotional or legal factor to say that the "human has the last word." An automation of "bound" approvals can free up valuable and scarce human resources.

But also, where real evaluations take place, civil servants can be greatly assisted along the way. Intelligent process automation (IPA) optimizes processes and digitizes existing, mostly manual workflows, enabling a smoother and seamless experience for citizens who are expecting faster resolution of their queries. Driven by AI, processes can be further assisted by powerful reasoning systems, and IPA can save taxpayer money through the reduction of fraud risks and enabling policy compliance.

While the ultimate decision-making power and supervision is to remain the prerogative of humans, and every automated decision must be verifiable and explainable, IPA has already generated steps towards more inclusive, transformative, and efficient public services.

Florence Rolland
Expert in Residence, France

Internal Use Case:

End-to-end ID inspection at the border

Western European Security Authority

The Storm: Every day, many complex ID documents need to be reviewed at the border by employees who are not fully informed about newly published security features and policies, leading to security issues. All this needs to happen in real time, with the danger of bottlenecks around every corner

The Wave: Automatic control using computer vision, deep learning, and OCR technology are used to achieve a high level of validation security – cross-checking all known falsification of IDs recently used. The document is identified by scanning the document and chip.

The Surf: Using ID proofing knowledge in AI, Capgemini's template-based document verification validates documents 10 seconds faster than existing solutions. It also provides fast alerts for common falsifications – useful for anomaly detection.

External Use Case:

IPA mitigates risk for COVID support initiatives

HM Revenue and Customs, UK

The Storm: Her Majesty's Revenue and Customs (HMRC) launched a series of support initiatives (job retention, sick pay...) during the pandemic and needed solutions to help mitigate against fraud and risk.

The Wave: HMRC used Pega's Intelligent Automation and Robotics solutions to automate manual aspects of its claim validation process for the government's COVID-19 initiatives. The implemented system stopped payments when risk was identified while ensuring faster disbursement to others.

The Surf: A quick deployment of the solution in only 8 days ensured public officials received requisite support in time. The schemes have since supported millions of claims.

AUGMENTED ME

Our lives are augmented by it. Our work is accelerated by it. And our world runs on it: data and AI.

Whether you're driving, handling documents, ordering a new phone, or just walking in a forest – all of these are enhanced by our ever-developing technology. Adding AI to business operations speeds up decision making and creates a symbiotic relationship that brings humans and AI closer together – from simple information analysis to digital companions, from preventing crime to forecasting deforestation and other disasters.

For both the private and public sectors, the mix between AI, learning intelligence and the capability to continuously automate over time holds great promise. Yet it also puts emphasis on a crucial topic: how to rebalance the relationship between humans and machines. Whether to shift trivial tasks towards faster, automated processes, or to create insight-driven suggestions for decision-makers, innovation questions us technologically and societally.

As AI technology advances and challenges us, we finally learn what it truly means to be human.

Marijn Markus
Expert in Residence, Netherlands

Internal Use Case:

Leverage AI to hunt spruce bark beetles in forests

Swedish Forestry Agency

The Storm: The onslaught of spruce bark beetles is threatening forests around the world every year. According to the Swedish Forest Agency, three to four million cubic meters of forests in Sweden were destroyed in 2018, damages summing to the amount of 100-million euros. It is very difficult to identify and quickly manage affected trees using manual processes.

The Wave: The Swedish Forestry agency leveraged Geo Satellite Intelligence through a mix of artificial intelligence (AI) and satellite imagery, to produce detailed maps that visualize the progression of the spruce bark beetles in the forest.

The Surf: The technology mix accelerates the detection and monitoring of infested areas. Capgemini Sogeti found 80% of the outbreaks using GSI and satellite analysis – versus less than 30% before. One forest owner alone could save approximately 15 million euros yearly in forest value using Capgemini's solution, with a ROI of three days

External Use Case:

Augmenting custom workforce with predictive analytics

South Korean Customs Services

The Storm: Identifying illegal counterfeit products can be tedious and complex, given the real-time requirements and the numerous cases needed to base decisions on. For the South Korean Customs Services, this became almost impossible when imported goods doubled over time, with the custom force remaining the same.

The Wave: The Customs Service relied on AI and analytics to augment its workforce in their tasks – mostly focusing on routine and classification tasks. The agency adopted data-driven decision AI to identify illegal imports more intelligently, augmenting 400 inspectors in their daily work.

The Surf: Since the implementation of the project, the detection rate for illegal goods improved by more than 20%. While more cases are being detected, the workforce also benefits from the technology to delegate trivial tasks and avoid bottlenecks that would have enabled criminality to remain hidden.

APPLICATIONS UNLEASHED

Read TechnoVision, the main report, for a complete overview of this technology container.

KONDO MY PORTFOLIO

When water doesn't move it becomes stagnant, growing increasingly hostile and toxic. When static, application portfolios drift away from alignment with the business architecture, and if unaddressed it can lead to a stagnant mix of legacy IT, technical debt and deviation from business objectives.

"Tidying up" your application portfolio is a continual and iterative endeavor which seeks to align business, applications, and technical architectures. At the center of this activity is a product-oriented, high-velocity, application-delivery mindset, leveraging new platforms and modern services to modernize your portfolio on simpler evergreen technology services.

Architecture and new platform technologies hold the key to systematically cleaning up, in the right order, and move forward to the desired state – delivering a simpler and more agile portfolio of applications services, prepped for the future.

It is this agility within the application portfolio that will enable public sector organizations to address outdated applications and deliver new ones rapidly, ready for change.

Paul O'Sullivan
Expert in Residence,
UK

Internal Use Case:

Transforming a state-owned railway company with ADMnext

Railway organization

The Storm: Challenged by local laws, a railway organization wanted to improve customer service and productivity, while maintaining daily business stability.

The Wave: The organization, supported by Capgemini, implemented a comprehensive DevOps and Application Services portfolio management and innovation transformation. Capgemini's solution ADMnext was delivered, featuring an agile-at-scale approach with a business process focus.

The Surf: The railway organization improved the average application uptime while reducing time to market. The software development life cycle went from an average of nine to three months, with 33 PoCs delivered and first projects live. Incidents related to downtime were reduced to zero, and customer satisfaction was boosted.

External Use Case:

IJPortal: Modernization of the eJustice IT system

The Integrate Justice Architecture Board (IJAB), NY City, US

The Storm: The Integrate Justice Architecture Board (IJAB) wanted to modernize its fragmented criminal justice legacy applications. Yet, it comprised of several agencies, all with competing priorities that must be considered when opting for an integrated portal.

The Wave: The IJAB implemented a common infrastructure, migrating its legacy systems into service-oriented architecture (SOA)-enabled Java/JEE applications with a single sign on.

The Surf: Through the modernization of the entire eJustice IT system, stakeholders improved access to criminal justice information, creating uninterrupted and streamlined communication among agencies. This not only enhanced public safety, but also achieved increased savings and efficiencies.

The IJAB case has become best practice for other New York state agencies in their application modernizations.

HONEY, I SHRUNK THE APPLICATIONS

Next-generation agile and highly responsive "light" application services utilize technologies like microservices, API-first, cloud-native, and headless. They allow public organizations to become more flexible and adaptive to respond in real time to events, weaving seamlessly around new situations, needs, and means of use.

Do you remember when applications were vast, cumbersome, and bundled together with traditional user interfaces and hardcoded business logic? Enter the science of minimization; building application services that are tiny, stateless, efficient, and scalable. Microservices, API first, cloud native and headless pave the way for the next generation of application services, which are ready for a variety of intent-driven user interfaces and can be connected and integrated by design. Applications that can be invoked at any time, from anywhere, and via any device, provide a flexible, agile and purpose-based springboard for citizens, agencies and partners. Welcome to the new age of applications. Small and not Big is the future – get your magnifying glass ready.

Sarah Saunders
Expert in Residence, UK

Internal Use Case:

[HMRC rapidly develops digital service to support employers (2020)]

HM Revenue and Customs, UK

The Storm: Due to Covid-19, HMRC had to work quickly to implement a solution that would allow employers across the country to furlough employees instead of separating themselves from them.

The Wave: Working together with agile and DevOps approaches, a digital service to support the Coronavirus Job Retention Scheme (CJRS) had to be developed in a very short timeframe. The solution provided a new digital service based on a microservice architecture on the digital platform, hosted in the cloud. The system collected information from employers and routed it to a risk and compliance process.

The Surf: While such an operation usually takes one year, the digital service was produced within four weeks. By the end of 2020, CJRS had assisted over 1.2 million employers and 9.9 million jobs, paid out claims worth over 46.4-billion GBP and processed over 4.5 million claims from employers.

External Use Case:

[Abilitator assesses work ability and functioning – Solmu project (2014-2022)]

Finnish Institute of Occupational Health (FIOH)

The Storm: The goal was to develop a self-assessment questionnaire, the so-called Abilitator, for measuring the work ability and functional capacity of unemployed job seekers. These are often hard to reach people, which hinders social inclusion.

The Wave: The Abilitator was originally developed for projects under the EU's Axis 5 ESF (European Social Fund) but has also been widely used by other operators. The service was implemented using a microservice architecture because the service will be extended in the future. Moreover, it will be integrated in the national digital service system.

The Surf: The Abilitator is being used to support the timely guidance of clients to the appropriate services and the transition towards work life or another goal. The Abilitator also offers decision-makers information about the target group and the changes taking place in it.

WHEN CODE GOES LOW

Low-code and no-code platforms make building next-generation application services a high-productivity matter for both IT and "business" specialists. When code goes low, the government agency's business or domain experts get on a high! You may be blessed with brilliant ideas for killer application services, but you'll need to deliver them blazingly fast and with the right quality – we're dealing with citizens here, after all.

Low code gives service managers in the public sector the tools to implement digital services for citizens quickly and independently.

Classic software delivery – based on slow, engineered processes and formal alignment between the parties involved – only gets you so far. It's useful for stable-scope, high-load-bearing core systems, but it is clumsy for citizen-centric apps that need to be built and adapt fast. It is easier than ever to construct applications without huge coding efforts. The secret is in powerful, AI-enabled tools that leverage API catalogs, prebuilt templates, and automation. These tools are so powerful, yet easy to use, that they bring both a quick application rate and tangible results to the public sector table.

Alexej Michaeli
Expert in Residence,
Germany

Internal Use Case:

MaPrimeRenov: a grant management platform

ANAH, French Housing Agency (France)

The Storm: In 2019, the French Housing Ministry asked French housing agency ANAH to launch a new grant scheme for housing energy renovation called MaPrimeRenov, to be delivered in only nine months, on January 1, 2020. More than 800,000 grants were to be distributed in 2021, representing more than two billion euros.

The Wave: Leveraging a low-code approach, the National Housing Agency ANAH delivered a grant-management platform serving both agents and users, building on Pega solutions. A very large Capgemini/PEGA team, comprising over 100 people, addressed strategic, governance, operational, and IT issues.

The Surf: With a strong challenge on time, low-code proved to be a successful approach, enabling the organization to deliver the platform on-time, in a highly political context.

External Use Case:

A fast and low-code solution for COVID-19 services

Kobe City (Japan)

The Storm: At the onset of the COVID-19 crisis, Kobe was inundated by up to 40,000 crisis-related citizen calls relating to assistance programs and status updates or volunteer opportunities each day.

The Wave: The city of Kobe developed a set of four apps with Microsoft Power Platform, including an automated telephone app that allows citizens to check on their status on applying for relief funds, or a chatbot and dashboards to access pertinent information.

The Surf: This case demonstrates the speed and impact of low-code tools when in the hands of a few individuals. In just one month, citizens were provided with an interface to easily access COVID-19-related information and call volumes dropped by 90%.

MESH UP YOUR APPS

Access to data and apps has never been more relevant for the public sector. Data exchange is key and the vast range of ways to access and use this data is critical for the public sector to remain more agile, more connected, more accessible, and more networked across borders.

To be able to unlock the power, it's time to Mesh Up Your Apps!

Driven by standards and the power of cloud, it's possible to manage your microservices-based applications to allow for cross organizational data exchanges, high co-operation and value-add both on a country level and globally.

The opportunities are endless!

It's the API economy, but in overdrive, opening new, agile ways of collaboration inside and outside the organization. Join the party, dance this mesh around!

Lisa Eckersley
Expert in Residence, UK

Internal Use Case:

[Leveraging API-enabled solutions to modernize student loans services]

HM Revenue and Customs, UK

The Storm: The legacy platform for the Student Loans Business Service (SLBS) needed to be modernized to support HMRC's strategic business ambitions, including policy and legislative changes for post-graduate loans.

The Wave: Using Capgemini's REGENERATE migration toolset and methodology, the existing application was automatically migrated to structured Java. This was followed by a deployment onto a modern private cloud environment using CI/CD. The new SBLS system encompassed 20 external APIs, 150,000 objects, over 100 procedure steps, and nearly 40,000 lines of code.

The Surf: HMRC has eliminated its dependency on legacy hardware and software. The introduction of CI/CD tools improved the ability to respond to change and supported the digital transformation agenda and future service enhancements.

External Use Case:

[Integrating healthcare data to deliver better patient experiences (2020)]

NSW Health Pathology

The Storm: NSWHP – a national Australian health organization providing reliable pathology to the public, such as Covid-19 testing – provides services to public institutions, including those in healthcare and justice. NSWHP aimed to strengthen its key business objectives and critical health services through highly efficient, innovative, and standardized nationwide ICT platforms and solutions, leading to improved patient outcomes and experience, achieving cost and operational efficiencies, and creating a foundation for change.

The Wave: NSWHP took an API-led approach and used MuleSoft to integrate 350 testing devices from its health facilities to systems across its 60 laboratories within three months. NSWHP's engineers and architects leveraged APIs as building blocks to securely connect point-of-care devices to electronic health record (EHR) systems that contained each patient's pathology results. Every provider has a 360-degree view of their patients and can provide them with the best possible care.

The Surf:

- 230K negative test results delivered
- 2 weeks to launch Covid-19 solution
- 1K+ clinical staff days saved
- Improving patient experiences and lessening their anxiety
- Data sync in near-real-time, often in fewer than five minutes
- Lower costs by making patient transportation to an approved laboratory unnecessary

APPS ❤ AI

AI is an important addition to the public sector – but it doesn't have to be a dedicated solution. It can provide many benefits to an organization:

- Intelligently automating administrative processes, administrative processes, such as document processing to reduce waiting times
- Personalizing interactions with citizens, ensuring they are provided with the right information and offered the right services based on their personal circumstances
- Detecting anomalies in citizen needs, compliance and risk
- Augmenting decision making to streamline citizen services.

More generally, many apps love artificial intelligence, and the combination offers great potential for the public sector. Equipping application services with AI is essential for governments and public sector organizations to deliver the simple, helpful, and delightful experiences that citizens expect. Boosting your current applications with a touch of AI will reduce the touchpoints with government through increased automation, allowing citizens to efficiently access the right services at the right time. This will create added value to the citizens or companies – who will love that extra intelligence.

Troy Wuttke
Expert in Residence, Australia

Internal Use Case:

Project Farm 2.0

Change initiatives (Kolkata) for local farmers in India

The Storm: Global demand for food is anticipated to increase by 60% by 2050. Seventy percent of world food production comes from smallholder farmers, primarily from developing countries, where the farmers' livelihood is under pressure.

The Wave: Together with a consortium of partners, Capgemini created project FARM, an intelligent platform to resolve global food shortages by using AI to determine farming patterns to assist farmers with predictive, diagnostic, and advisory functions. FARM 2.0 is custom-made for India.

The Surf: The platform optimizes the value chain by providing key insights for small-scale farmers to improve their decision making and optimize their farm yield. In this regard, automated farming can also be brought to small-scale farmers in developing countries so that they can catch up on the digital divide.

External Use Case:

WIFIRE: Fighting fire with AI

Los Angeles Fire Department (LAFD)

The Storm: The Los Angeles Fire Department (LAFD) is responsible for approximately 1,215 square kilometers of territory. Due to climate change, wildfires are more prevalent in the area, larger and more destructive, calling for new instruments to tackle this surge and for the LAFD to be better prepared.

The Wave: The LAFD started using WIFIRE, a real-time interface simulating and projecting the spread of wildfires by connecting i.e., satellite maps of territory with live weather information and infrared images from fire planes. Learning from historical incidents, it can also predict potential fires in the future.

The Surf: With the fire map and the gathered data being relayed within minutes to involved teams – both on the ground and in the air – fire departments can allocate their limited resources more effectively, thereby preventing wildfires from causing major damages to property and from posing a serious threat to human life.

Read TechnoVision, the main report, for a complete overview of this technology container.

LORD OF THE CLOUDS

IT infrastructure is in the midst of a game-changing evolution – one that rides on the shoulders of the cloud revolution to deliver flexible, resilient, scalable, and cost-efficient services on demand with the key principle of everything-as-code.

Public sector organizations are increasingly challenged to improve citizen interaction, respond quickly to unanticipated challenges, and reduce overall cost to serve. On this journey, virtualization and containerization are key to standardization, hiding complexity, and rendering deployment invisible. These approaches allow for rapid, seamless deployment and update of complex infrastructure on demand, deploying solutions in minutes – where previously timeframes were measured in weeks or months and prone to human error. This combines with the benefits of consumption-based charging, low-cost resilience, and autoscaling design patterns, allowing public organizations to deliver secure infrastructure solutions – at a fraction of the cost and in a fraction of the time.

Whether supporting agile development or legacy modernization, adoption of these approaches has required shifts in culture, in conjunction with the technology. Agile DevOps processes and ways of working have infused these organizations with a drive for continual improvement and optimization.

Mick Halliday
Expert in Residence, UK

Internal Use Case:

Transition a mission-critical platform to Microsoft Azure

HM Revenue and Customs, UK

The Storm: As part of its modernization and cloud-first strategy, HMRC aimed at moving its SAP platform from existing data centers to a scalable public cloud environment to more effectively use its data, lower costs, simplify its IT estate, and support new services.

The Wave: Together with Capgemini, HMRC implemented a vast and complex migration to Microsoft's Azure cloud platform, performing the actual transition in a single weekend to avoid disruption to critical national services. In addition, a workstream was established for improved understanding, covering 650 interfaces.

The Surf: As a result of this migration, HMRC reduced operational costs and improved the speed and resilience of the environment deployment. Thus, faster problem solving and automation, as well as improved response times for users, could be achieved. This has resulted in a future-proof infrastructure platform with lower operating and modification costs.

External Use Case:

VMware helps the British Army to build its private cloud

The British Army

The Storm: The British Army required a new hosting system to deliver the application services needed to support daily business operations for up to 50,000 users. Applications include those used for enterprise resource planning, training, staff competency and reviews, combat readiness, HR systems, and scenario planning.

The Wave: The British Army partnered with VMware to deploy an agile, resilient, and scalable estate. VMware's vRealize Suite included a private cloud infrastructure, enabling the deployment of applications within a siloed infrastructure. The shift to a software-defined data center coincided with an ongoing cultural overhaul, embracing a DevOps way of working.

The Surf: VMware's solutions allowed for a quick development of the new software, reducing time for application deployment, and avoiding high costs of SI load balancers, core switches, and firewall services. Furthermore, the time gained enabled the army to focus more on operational efficiency, allowing the organization to scale up on demand.

CROUCHING TIGER, HIDDEN CONTAINER

All the complex infrastructure an application needs to run on, nothing to see but containers. Containers – they simply package an application with the infrastructure, middleware, and platform service components needed into a sealed off, air-tight, standardized box that can be shipped between different actors on a municipal, state, federal, or even European level, making collaboration easier and cheaper.

Pack your application neatly into such boxes, make yourself highly flexible and take a step to digital sovereignty. Different operating systems? Multiple data centers? Local operation or in the cloud? Virtual machines or bare metal? Depending on the current situation, you decide where to run your application and simply move it when the situation changes – quickly, automatically, and without time-consuming installation and configuration.

With containers, you also can address your problems with slowing down applications at peak times. You simply start the containers multiple times and distribute the workload. Essential applications remain available to citizens and employees.

Nannette Biedermann
Expert in Residence, Germany

Internal Use Case:

AWS cloud migration for Home Office

UK Government immigration service

The Storm: The existing hosting platform of the UK immigration service lacked the scalability and stability necessary to support the Home Office's ambitious transformation agenda.

The Wave: Together with Capgemini, the Home Office managed its migration to the AWS cloud platform, with an additional support team in charge of maintaining business as usual. The project involved the move from firewalls to security groups, routers to routing tables, and load balancers to ELBs.

The Surf: The redesigned and simplified infrastructure has improved the stability and resilience of the Home Office's cloud environment, enhanced reliability of deployment, and improved the security of the production service. It has also increased the ability to scale and to optimize infrastructure costs (build times reduced from two days to one hour), operational business, and live services. The project furthermore achieved 35% reduction in weekly incident volume.

External Use Case:

DevSecOps on F-16s and battleships with Kubernetes

US Department of Defense

The Storm: In the past, software delivery within the US Department of Defense (DoD) could take anywhere from three to ten years for big weapons systems – incremental delivery was difficult and slowed the implementation of new requirements and technologies.

The Wave: To tackle these issues, the organization created the DoD Enterprise DevSecOps reference design, with a mandate to use CNCF-compliant Kubernetes clusters and other open-source technologies across the DoD.

The Surf: The project enabled the DoD to move from three-to-eight months to a week for implementation, and to obtain the authority to operate a cloud enclave within one week. "Anytime it's going to pass the gates, the software is automatically accredited. You can push software multiple times a day," the organization says, emphasizing that the solution is "going to be a 100-plus years saved off planned program time."

SIMPLY THE EDGE

The recent boom in IoT and cloud solutions has led to the emergence of edge computing. When public services organizations centralize their infrastructure, increase their central processing capabilities and increase the use of IoT solutions, significant amounts of data need to be exchanged. And that can lead to latency and bandwidth challenges, not only for city states, but especially for widely dispersed nations.

Edge computing addresses these challenges through bringing processing capabilities closer to the end-user device. With processing carried out at, or very near to the source of the data, edge processing can be done to either determine the next processing steps or deliver the answer the user is looking for. All public sector contexts, where immediate data processing is required, will henceforth profit from edge computing.

Traffic, especially autonomous driving, health, crime reduction: in all fields where public sector organizations must react to live-changing occurrences and patterns, edge computing can greatly enhance both end-user experience and responsiveness.

Iftikhar Ahmed
Expert in Residence, Germany

Internal Use Case:

Saving lives with the Red Cross in Portugal

The Storm: The Red Cross wanted to enhance life-saving communications technology between emergency technicians and medical specialists in hospitals.

The Wave: Capgemini Engineering worked with the Red Cross and a mobile provider in Portugal to deploy 5G. Using HoloLens glasses and ultra-high definition, 360-degree cameras in ambulances, technicians now transmit critical data and imagery in real time to doctors in hospitals, who then send back instructions and guide emergency procedures through the augmented reality in the glasses.

The Surf: 5G proved its ability to facilitate seamless communications with no disruption or time lag, which has played a key role in supporting the treatment of patients wherever they are. Furthermore, the project resulted in a greater understanding of business connectivity needs and how to meet them.

External Use Case:

How edge computing will enable a faster, more resilient government

US Northern Command, Federal Emergency Management Agency & Department of Veterans Affairs

The Storm: Several US agencies sought solutions that are able to absorb periodic surges in computing and data processing needs and the availability of agile data centers that are ready to withstand natural catastrophes.

The Wave: The US agencies turned to edge computing solutions in the context of COVID, to better deal with the requirement of temporary medical deployments in the crisis. For instance, the Federal Emergency Management Agency (FEMA) built a field center to cope with the need of the hour.

The Surf: Edge computing gave the agencies greater operational agility and led to cost savings. Edge computing brought the power of high-level computing directly to mission-critical users, wherever they may be. The edge computing setup and robust data analytics enabled the organizations to be freed of the dependency on cloud or remote data centers.

OPS, AI DID IT AGAIN

AI is the pillar of automation in many domains including in IT operations – in particular when it comes to improving efficiency and reliability of IT systems, devices, and applications that maintain critical citizen data in the public sector. AIOps helps IT departments to mitigate any risk of data loss, financial loss, improve cost optimization, and encourage transparency. An AIOps system first collects data from multiple sources such as log files, ticket numbers, network traffic, etc. and the machine learning algorithms are then used to collect, correlate, learn, and resolve anomalies in the behavior of IT applications without humans.

Government agencies strive to provide the best experience to their citizens, be it for filing tax returns or paying for a parking ticket. To intelligently automate IT operations with the help of AI and ML in the public sector, IT operations will have to move from the back office and become a strategic function to improve public sector safety and productivity while coping with a more heterogeneous field of applications. Government offices don't have to remove their existing legacy IT to implement AIOps, they can simply integrate AIOps – making use of advanced analytics and ML to automate operations and monitoring.

Anchal Bhalla
Expert in Residence,
Middle East

Internal Use Case:

Code analysis using machine learning

Employment agency in Germany

The Storm: Prior to the project, conventional quality control methods thoroughly tested software, but often let errors slip through. Tests covered most of the code, but errors often resided in the sections that were not fully evaluated.

The Wave: Capgemini and the FEA developed a machine learning-based static code analysis tool to find patterns and rules for error-free code in a code base.

The Surf: The benefits include an optimized quality assurance through the identification of code patterns and software errors, the avoidance of hotfixes, and the identification of useful rules that affect functional and non-functional requirements. After just two months of deployment, the system found useful rules for functional and non-functional requirements, for example for the detection of missing codes for closing transactions.

External Use Case:

Dubai Smart City 2021

City of Dubai

The Storm: The Smart Dubai Office is responsible for guiding and implementing policies required to achieve the citywide effort to become a smart city, implementing solutions such as paperless transactions and interconnected communities.

The Wave: Dubai has transformed itself into a model smart city, revolutionizing the way government services are delivered by launching over 100 initiatives and more than 1,000 services by two dozen government departments and private sector partners in less than three years.

The Surf: The city's strategy is shared across the city's government and private sector, delivering optimized use of urban resources, integrated seamlessly into daily life, creating the most enriched life and business experience possible. In the three years of deployment, the city has witnessed an increase in happiness of 3%. Services delivered included an ICT enablement of critical infrastructure, a transition towards circular economy, and a zero-visit rule for government administration.

SILENCE OF THE SERVERS

Continuously build and deploy the next generation of public sector software, without even noticing infrastructure. Sounds like a good idea for commercial organizations. But the ultimately invisible infrastructure is there and ready for use in the public sector as well. Goodbye server room per office building. Hello IT-asset-free government.

Infrastructure as code, radical automation, software containers, microservices and serverless computing are all paving the way towards cost managing and easy-to-use IT infrastructure, without being bothered by complexity. With software being continuously developed and deployed on an infrastructure that automatically adjusts, IT can finally become the powerful utility it was destined to be; always available to civil servants as well as to the general public, just unperceivable. So, uncork this bottle of opportunity and make sure your servers are silent.

Wijke Hamer
Expert in Residence,
Netherlands

Internal Use Case:

Kadaster: PLP – infrastructure platform on demand

Kadaster, the Dutch Land Registrar

The Storm: Software development in the DevOps teams required many new server instances per day. Each new instance consumed time from an infra engineer and the software engineer.

The Wave: PLP was built to automate the process of creating server instance(s) and installing the right software, thus creating a runtime platform. Through a portal, the user indicates what type of platform and capacity is needed in terms of processing power, memory, and storage. Initially built to support the on-premises virtualization infrastructure, the current version also supports cloud providers and delivers container orchestration platforms. Future versions might include cost aspects in the choice for the underlying technology.

The Surf: The productivity of the DevOps teams drastically increased. End-customers get additional computing power in moments and servers can be shut down automatically, which decreases cloud provider costs.

External Use Case:

Using serverless to power an EU government supply-chain control system

European Commission

The Storm: The European Commission, backed by a new European law, needed to protect citizen health and reduce the availability of illicit tobacco products by guaranteeing a track and trace for finished goods.

The Wave: Dentsu Tracking worked with AWS on a government supply-chain control system. This traceability platform is powered by serverless technologies, making Europe home to the world's largest supply-chain track-and-trace platform.

The Surf: The platform connects millions of facilities and individual economic operators to deliver unique serialization, aggregation, and integration for every single pack of cigarettes. Through serverless infrastructure, the deployment saved weeks on time to market, while reducing costs. It also enabled the EU to scale its operations for tracing over 150 billion products in real time throughout the process chain, from production to retail.

BALANCE BY DESIGN

Read TechnoVision, the main report, for a complete overview of this technology container.

TECHNOLOGY ∈∋ BUSINESS

Every public sector organization needs to be a "Technology Business"; the COVID-19 pandemic has clearly shown that. By increasing the use of technology, public sector organizations were able to maintain their services or even deliver more valuable and effective services to their citizens.

Today, a state-of-the-art public sector organization does not separate policymaking, implementing, operating, and related technologies. The previously meticulously established and maintained siloes set up between the business of a public sector organization and the relevant IT organization have been removed.

In a Technology Business, public sector teams work jointly on citizen-centric products – rather than on projects – with a potentially indefinite lifecycle, guided by shared budgets and objectives. The skillsets of the team members may differ, but they will certainly overlap more over time, as a successful unity tends to do. The next stage of this integration must be to consider how policies will be implemented digitally from the beginning of the legislative process.

Michael Stoelinga
Expert in Residence,
Netherland

Internal Use Case:

Live healthcare digital platform bringing together regional professionals around data

Aquitaine region (France)

The Storm: Public healthcare wanted to develop an adaptable and multidisciplinary approach to treat patients with chronic diseases. The Ministry for Health launched a pilot program in 2015, called "Territoires de Soins Numérique" (Local Digital Health), to better manage chronic diseases.

The Wave: Capgemini helped regions to build a platform called Digicare, aiming for patient support programs on specific pathologies and treatments.

Phase 1: Federated medical actions using digital channels

Phase 2: Collected data from the teaching hospitals to field healthcare professionals

Phase 3: Provided personalized expertise from AI-based data collected in the field.

The Surf: The project led to engaging 120,000 patients, 5,000 engaged healthcare professionals, and achieved a decrease of 20% in emergency room visits for patients enrolled in the program.

External Use Case:

Digitized technical procedure for effective fisheries control

German Federal Office for Agriculture and Food (BLE)

The Storm: The lack of integration of landings, sea inspections, and visual reports from federal and state control units, as well as distributed data volumes, media disruption, and a lack of end-to-end checks made extensive automated plausibility checks within the framework of the mandatory EU Fisheries Control Regulation difficult.

The Wave: The new Fisheries Information System (FIT), a central data platform for seamless fisheries monitoring, enables the collection of data and makes it directly available to all relevant control units so that the data can be processed with more sophisticated plausibility checks.

The Surf: New technical standards, the early involvement of users in the implementation process to shape the design, and the transparent communication of the advantages of the platform eliminated previous data silos. Agile, interdisciplinary cooperation between the software provider Scopeland and the BLE experts displayed an effective fusion of technology and business.

ADAPT FIRST

The public sector never easily embraced change, but now it must. The speed of change continues to increase; demographic changes, climate actions, and the recent pandemic were just a few symptoms of this continuous change we are observing. In such a world, the public sector must be resilient for the sake of its society, which means first and foremost, adaptable. Building agility is therefore one of the most important demands for making one's own organization fit for the future. This also applies to those agencies that still feel that they are not directly affected, as the sustainability transformation will catch up with everyone.

The entire Technology Business landscape must be designed for speed, even more in the public sector, with an ode to iteration and resilience. Processes must be questioned again and again, and continuously adapted. Shorter and more flexible planning cycles are needed to be able to react to changes at short notice. Existing obstacles must be removed or circumvented. It's all part of becoming "like water."

Thomas Heimann
Expert in Residence,
Germany

Internal Use Case:

Bringing iteration and agility with SAFe & DevOps to the French Army

French Defense Procurement Agency (DGA)

The Storm: The French Army is engaged in securing and upgrading its military intranet, managing the effective exploitation and processing of its data.

The Wave: Alongside a consortium of partners, the French Defense Procurement Agency launched ARTEMIS, a partnership agreement to provide a big data platform. In this context, Capgemini supported the agency with the SAFe® model implementation to infuse agile principles throughout the project's delivery.

The Surf: Via the implementation of a scaled agile framework, collaborative work was strengthened with related architectural projects to enhance coherence with the global strategy. The silo effect could be reduced, and organizational or technical difficulties were identified.

External Use Case:

Preparing teachers for the transformation towards hybrid learning

Ministry of Education, Culture, Research & Technology in Indonesia

The Storm: It's not just the pandemic that has highlighted the need for digital classrooms and remote teaching. Generally, a transformation towards hybrid education is taking place. Yet, as teachers are the main driver, digital literacy plays a key role.

The Wave: Together with Microsoft, the Indonesian Ministry of Education, Culture, Research, and Technology organizes "The 21st Century Digital Skills Training," a free program for teachers throughout the country to improve their digital skills.

The Surf: The program facilitates the teaching experience not only for teachers but also for students, promoting inclusivity and flexibility. It empowers teachers in expanding their IT expertise to be well prepared for the future of learning. The goal is to empower over 24-million Indonesians through the skills programs by the end of 2021.

WITH OPEN ARMS

The public sector is one of the few ecosystems in which monolithic systems still live. While these closed and immutable systems may do the job that they were designed to do, they struggle to keep up with change, which takes too long, is expensive to build, and even more expensive to maintain.

In a rapidly changing, complex, connected world, even the leading technology organizations in the world do not do it all alone; they form partnerships and shape ecosystems. If they cannot make it on their own - despite their huge technical and financial resources - then the public sector must embrace openness where it has not already done so. Luckily, the Open Government has done just that over the last two decades – creating opportunities for agile and open ecosystems that thrive on state-of-the-art technologies and open platforms as powerful vehicles to communicate and empower citizens.

At all levels of government, technology shows itself as committed to helping the public sector advance sustainable development worldwide and improve its strength and posture, digitally and socially.

Jessie Hernandez
Expert in Residence,
US

Internal Use Case:

Building an open data platform for European cities

European Commission (EU)

The Storm: Brought to life by the European Commission, the Intelligent Cities Challenge (ICC) strives to bring together 136 cities in their respective processes to shape their smart territories with the help of technology. The focus on shared priorities such as sustainability, social inclusion, and intelligent planning is thought to open the floor to collaboration.

The Wave: The ICC set up its challenge as an ode to openness, with regular networking opportunities, an ICC City Lab, and access to training or common online toolboxes. Furthermore, an open data platform linking city labs was created while cities have access to a Tech4Good marketplace, a showcase of technical solution offered catalog-style.

The Surf: Through the ICC's set up, cities stay up to date with fresh policy inspiration and sources of funding. They address global challenges globally and benefit from a federated constellation of similar projects.

External Use Case:

Life SG – An app built with open culture

GovTech Singapore

The Storm: In 2018, Singapore launched the Moments of Life app to help new parents to quickly go through the registration processes for their newborn children – this example formed the ambition for one app to cover all digital services dealing with key occurrences in a citizen's life.

The Wave: LifeSG was created to accompany citizens throughout their lives – accessible, simple, and covering 40 government services. The use of open data was a key focus to enhance the various processes involved.

The Surf: By embracing an open platform, LifeSG resulted in time and cost reductions for maintenance. With all services within one app, the citizen experience was greatly improved, with the birth registration to baby bonus application process lasting just 15 minutes, instead of 60.

DO WELL, DO GOOD

The ocean is the world's largest connected ecosystem. It reminds us that mankind only makes up a small part of the big picture. Facing limited natural resources, we need to accept that we can't have it all. Not everything that is technologically possible is socially desirable.

It's time to take the helm and prioritize sustainable, less demanding, and reduced impact solutions. IT has the potential to not only cut carbon emissions but also to be purposeful and offer a positive societal benefit that serves the wellbeing of all stakeholders. The UN's 17 Sustainable Development Goals (SDGs) recognize the critical factors required for societal good: ending deprivation and poverty, improving health and education, reducing inequality, and spurring economic growth – all while tackling climate change. Initiatives like the AI for Good platform show that technology can actively benefit societal purpose. Thus, public sector organizations not only act on their public value, but also set an example by finding innovative solutions to both national and international grievances. Cross-border cooperation enables states to join forces and make a difference in the world.

Shobha Meera
Expert in Residence, US

Internal Use Case:

Germany4Ukraine: Central digital assistance for refugees from Ukraine (2022)

German Federal Ministry of the Interior and Community

The Storm: With the war in Ukraine, thousands of refugees arrived in Germany every day. The federal government faced the challenge of coordinating accommodation and medical care, work permits, and mobility offers.

The Wave: Capgemini helped develop the Germany4Ukraine website and app, which provide essential information to refugees from Ukraine. Within just ten days, the team designed the concept, configured the CMS as a CoreMedia satellite of the Press and Information Office of the Federal Government, and prepared all editorial content in Ukrainian, Russian, English, and German.

The Surf: With the help of the portal and the associated app, it was possible to respond quickly to the challenges. In May 2022, the portal had more than 14,000 visits every week. Further, refugees can download information in any country because the app is available throughout Europe.

External Use Case:

Innovative partnership to predict famine (2018)

UN; AWS, Google, World Bank, International Committee of the Red Cross, Microsoft

The Storm: In 2017, more than 20 million people across north-eastern Nigeria, Somalia, South Sudan and Yemen faced famine. In the past, famines were often responded to too late, resulting in high aid costs.

The Wave: Artificial intelligence (A)I and machine learning (ML) can be used to assess and predict escalating food security crises in real time so that decision-makers can respond sooner. The tool developed by this global partnership combines satellite data on issues such as rainfall and crop health with social media and news reports on more human factors, such as violence or changing food prices. It also sets up funds that are automatically allocated to a food crisis once it meets certain criteria to speed up the process of funding hunger relief.

The Surf: These interventions can save more lives and reduce humanitarian costs by as much as 30%. Moreover, it enables an analysis of the triggers that lead to famine.

TRUST THRUST

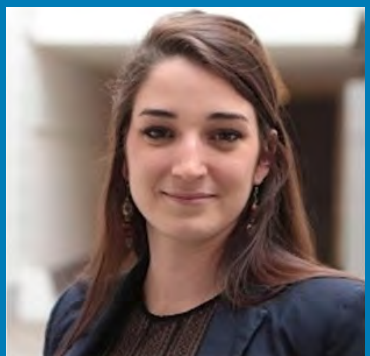
If the pre-pandemic conventional wisdom for trust was "slow to earn, quick to lose", the current play or post-pandemic wisdom needs to be different. Use the best technology armory at your disposal to build or rebuild trust much faster. We should ask ourselves: how long can we tolerate a lack of trust – in ourselves, in our organization, in our systems of government? Public sector organizations have no choice but to put the quest for trust at the core of their operations.

First, they need to ensure reliability and security, at a time when cybercrime has never been this high. Armies, cities or hospitals need a resilient infrastructure in order to host sensible data and leverage innovative technologies.

Secondly, trust is built through transparency, with an ethical use of technology, especially when with paradigm-shifting technologies such as AI, where decision-making processes and skillsets are impacted. Show what you do and justify why you did if needed!

Thirdly, give your citizens control of their destiny, and the use of their data, with a cockpit in which they can decide what to share.

Finally, trust comes from understanding, translating technology to business and business to technology. So boost up and reskill along technology dynamics. Citizens and government employees that understand technologies, will trust them more.



Charlotte Wojcik
Expert in Residence, France

Internal Use Case:

A cybersecurity experience center to train against cyberattacks

Capgemini solution, involving Europol partnership

The Storm: Digital transformation exposes organizations to digital risks, testing their resilience capabilities. As such, this requires the right technologies and capabilities to detect significant cybersecurity incidents and respond to them.

The Wave: Capgemini's Cybersecurity Experience Center offers on-site and remote cybersecurity incident simulations in various settings. With the establishment of a "Cyber Range," the Center provides a multi-range and multi-user simulating physical infrastructure in a virtual environment, providing a SOC, an OT/Scada control room and a boardroom for the executive level.

The Surf: The tailormade training scenarios prepare C-level executives and security professionals to tackle cyberattacks before they have a real impact on the organization's core business, therefore incoming threats can be mitigated.

External Use Case:

Protecting the city that never sleeps from cyber threats

New York City Cyber Command (NYC3)

The Storm: The New York City Cyber Command (NYC3) was established in 2017 to protect the city from cyber threats. New York City is responsible for more than one-million systems that deliver critical services, yet cyberattacks are a growing concern.

The Wave: In order to support its cloud operations, the NYC3 adopted Google's Site Reliability Engineering (SRE) model, providing a data pipline with risk alerts, visualization, and analytics to the Cyber Command Staff.

The Surf: The platform ensures that the government agency delivers cybersecurity data and services to more than 100 city agencies immediately and without interruption. NYC3 is the first Google Cloud customer in the public sector creating its own formal SRE team, keeping security systems available 24/7 for the city that never sleeps.

IQ CQ EQ UP

As the volume, complexity, and velocity of data continue to increase, AI's capacity to build an organization's IQ and EQ through enhanced data capture, as well as its ability to mimic human action and decision making, will become increasingly valued in solving global challenges.

For example, an important indicator of EQ is the ability to accurately interpret others' emotions. Better than many humans, AI's carefully trained neural networks can help to accurately process human emotions through language and facial recognition and turn them into data. The enrichment of data and derived insights ensuing from the embedding of EQ into AI, is aiding the public sector in governing its people in a data-driven, yet ethical, manner.

What's more, allowing AI to handle the bulk of arduous tasks grants the workforce increased bandwidth to focus both on the details that require human interaction, as well as the creative brainstorming of new solutions (its creativity quotient), hence IQ EQ CQ up.

Melissa Hatton
Expert in Residence, US

Internal Use Case:

Social media analytics in the context of the Ivorian election

Ivory Coast

The Storm: Viral dissemination of fake news on social networks is the most dangerous spread of disinformation as it can erode trust in government and have major political effects, such as riots at the US Capitol following the 2021 presidential election and during the 2010 elections in Bloom, Ivory Coast.

The Wave: The key to combating disinformation is to identify and dismantle it before it goes viral. Bloom's solution did just this by applying two innovation pillars using AI: semantic and social inference. Firstly, semantic inference helped to understand relationships between words to identify and characterize communities. Secondly, social inference identified the relationships between parties and analyzes communities.

The Surf: Using semantic and social inference, social data was turned into smart data to successfully identify fake news in advance of it going viral during the 2020 Ivorian election campaign. This solution is scalable to mitigate viral disinformation and the emergence of riots worldwide.

UK government using emotion detecting AI for digital content

UK government

The Storm: With approximately 60% of the globe active online, there is no simple "one size fits all" approach to online content. The human experience and response to social media and the news is very fragmented, resulting in citizen dissatisfaction and even distrust when universal content and policies are pushed to the public.

The Wave: The UK government decided to apply the solution of FlyingBinary, which uses AI to understand and recognize 20 human emotions with resonance to five human responses to online content. Building on billions of data points, the solution classified emotions, such as anger or shock, and detected patterns of each emotional response to online content.

The Surf: The AI solution continues to help organizations understand the online audience before content is published and is being deployed as part of a G-Cloud 10 service built for the UK government. While being GPDR (EU law on data protection and privacy) compliant, the solution further helps to create policy changes that address citizens' current feelings on certain subjects.

NO HANDS ON DECK

Self-adapt: from automation to autonomy in control, public sector organizations currently face enormous challenges and those organizations that have embraced intelligent automation are delivering efficient, adaptable, and responsive ("water-like") services.

While making sure that humans are involved to monitor and discover unexpected frictions – always staying in the deciding seat – a well-balanced automation mix augmented by AI intelligence is a treasure for constantly improving the end-to-end service offered to the citizen.

For all trivial processes, self-driven processes will change the public servant's life for the better, while citizens will be thrilled to discover the pleasures of a seamless once-only-principle and interoperability. In paper-heavy, interactive processes, the human is still the one who gives the direction. But there is nothing bad about going with the flow, drifting along where simple requests can be decided based on clear criteria. All in a heartbeat.

Pritam Poojari
Expert in Residence, UK

Internal Use Case:

AcUIty unemployment insurance solution

Unemployment insurance agencies (US)

The Storm: Workforce agencies need solutions that enable them to provide timely and accurate payments, prevent fraud, and allow access to the system from any device, anytime, anywhere.

The Wave: AcUIty is a modern unemployment insurance (UI) solution designed to support state-level UI benefits and manage and address complex financial, eligibility, and claims-management requirements. The solution is differentiated by automated intelligent business-process workflow and a configurable architecture.

The Surf: Automated processing of claims, online edits, workflow, and case management bring business efficiencies and opportunities for ROI. Automated routing of tasks reduces cycle time and well-defined business processes ensure faster deployment and better integration with federal systems and fraud prevention. One workforce, AcUIty, realized a 1.5-million USD reduction in annual operating costs, while increasing free time for the staff by 20%.

External Use Case:

Fast and seamless passenger flow at Changi Airport

Changi Airport (Singapore)

The Storm: Already recognized as at the forefront of tech savviness, Changi Airport set the ambition to improve the passenger experience while keeping security standards high. Terrorism and criminal activity were imminent threats to maintain as focus.

The Wave: The FAST (Fast and Seamless Travel) solution for a secure and seamless passenger flow involves a biometric capture of passengers to facilitate automated bag drop, automated immigration and boarding gates, and a passenger process facilitation platform that links the various airport and airlines' systems.

The Surf: The project helped Changi Airport to increase passenger satisfaction as the benefits included faster processing and combining separate touchpoints into one solution. Automated systems reduced language barriers and the need to provide multiple documents at multiple checkpoints so travelers could arrive closer to flight time.

A FEW MORE THINGS ACROSS THE PUBLIC SECTOR

37 waves across seven seas have shown: Technology and business merge together in many ways, shaking up the public sector with all kinds of data, process, and other technology currents.

The special waters of the public sector

Let's take a moment to talk about the specificities of the public sector. While this sector embraces innovation and technology as much as any other, some standards from "other industries" don't apply, or are not even desirable. For instance, as we saw, the aim may be on thriving on data and offering a frictionless user experience to all involved, but surely direction and pace need to be carefully managed to avoid the maelstrom of biased, low-quality data and an administrative overreach that violates citizens' privacy.

The fact that there is no market to be defended or competition to be feared allows for more caution but should not invite stagnation – swift change is still needed, as our report has shown again and again. Organizational goals are more likely geared towards completeness and sustainability, rather than towards monetization and competitiveness. This is perhaps one additional level of agility that the public sector embodies in different waters, where the balance between human and machine – and between capabilities and purpose – comes with different shades of blue.

Troubled waters

By being less daring than wild water rapids, and by having whole societies on board as stakeholders instead of just selected target segments, the public sector is as vulnerable as it is valuable to society's progress and wealth. This should be always considered, as it applies to challenges both from outside and inside. Cyberattacks and online disinformation are a threat to the flow of the public waters, impacting both individual citizens and society. These threats require the highest levels of resilience and governance, with a solid and sovereign data infrastructure at the very foundation. Threats can also come from the inside: unethical technology, whether through using biased data and algorithms, non-compliance to privacy rulings, or use cases in undesirable areas, will bring confusion or, worse, will bring technology-driven innovation and change to a screeching halt.

Resilience for the better

While these scenarios of troubled waters might shed a pessimistic light on the public sector, it is rather the contrary: with its responsibility and critical mandate comes a powerful ability to steer change and to set standards! Equipped with built-in resilience and with a specific flair for the geopolitical dimension, the way towards a true "technology-driven sovereignty" is open, setting new ambitions for how society uses the potential of technology and embraces its realities. International "data waters" can then rely on a new technology governance, such as in GAIA-X, better protecting citizen rights against attackers, and in defining what should be shared and common technology foundations. This strong resilience against outside threats opens the ability to always explore new areas, for the benefit of all and society.

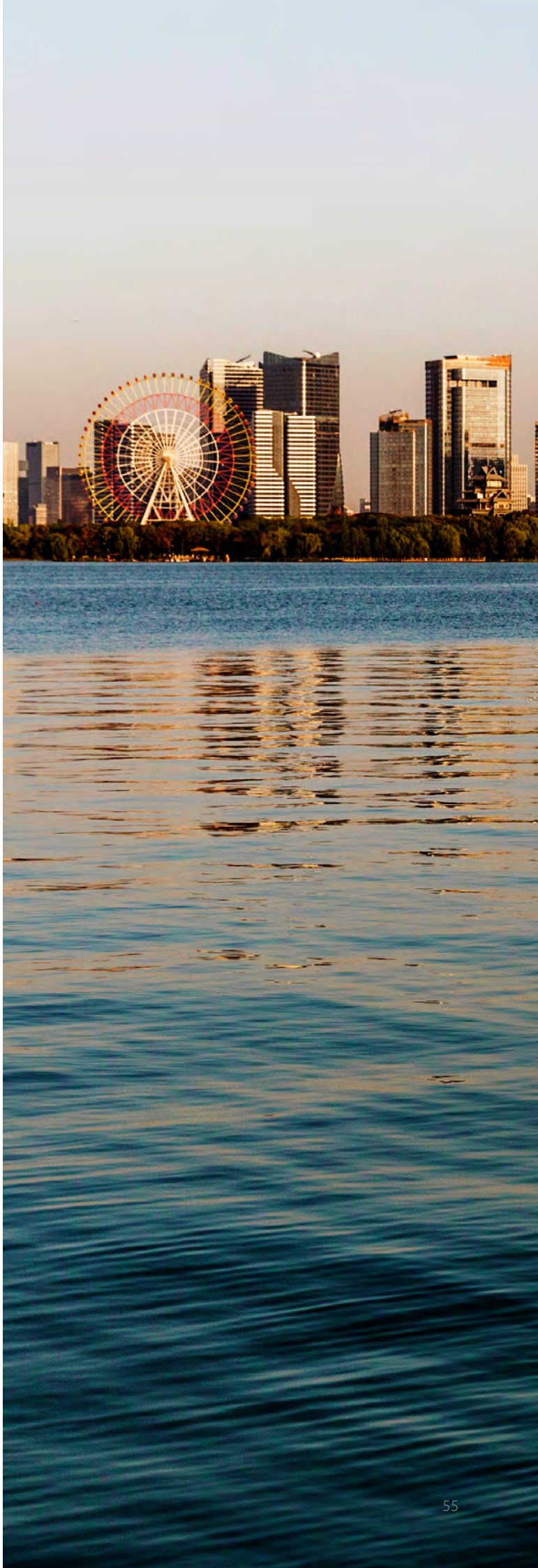
Next-generation society

It brings us all the way back to the tantalizing prospect of a "Society 5.0": a next-generation, smart society, perfectly enabled by innovative technology. On the journey to Society 5.0, the constant balance between innovation and caution, e.g., between hyper-personalization and data protection, turns out to be a core strength. Online accessibility makes us create new ways to reach out to literally everybody, nobody excluded. Sustainability guides us on how to reimagine our ways for the better and the substantial, reconciling the values of optimization and conservation.

Mission economy

Crucially, governments don't need to (and shouldn't) do it alone! In some cases, society may help in a crowdsourced manner, as we have seen with "WirvsVirus." Industry is also by the side of government to help, and by setting the rules of collaboration, governments can even influence industry's course as a whole, through standards, legislation, or sheer purchasing power. Once all sides have agreed on the mission to achieve, they can divide up the work, drawing on each other's strengths and combining the best of both worlds – that is what we mean by the "open arms" and the "we collaborate" paradigms. To play their respective parts in this mission, not only will industry have to adopt new standards and paradigms, but the public sector must also fundamentally reinvent itself, becoming more "entrepreneurial" and proactive. So, besides the external challenges of the health and climate crises and technological innovations, the public sector must take on a cultural and organizational transformation – a truly Herculean task!

Sitting on the dock of technology-driven government, the public sector offers us a societal mandate: there is an ocean of opportunities when it comes to the application of technology for a better and more sustainable, more inclusive world. Hopefully, TechnoVision helps you to set the right course on these waters, with, or without, all hands-on deck. Bon voyage!



TECHNOVISION 2022-23 : Public Sector Edition

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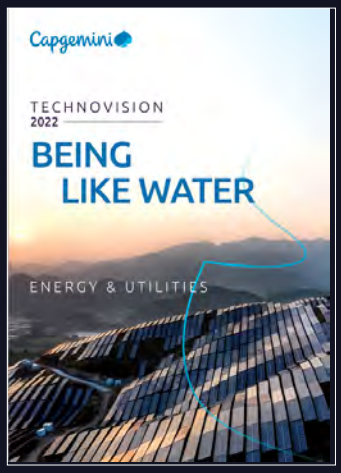

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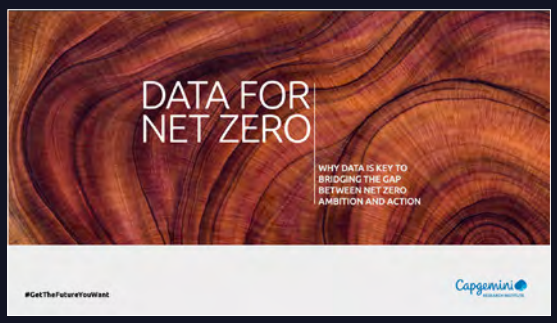

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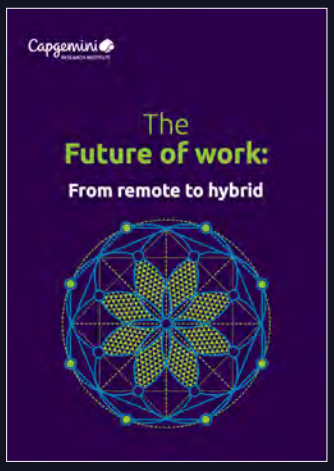

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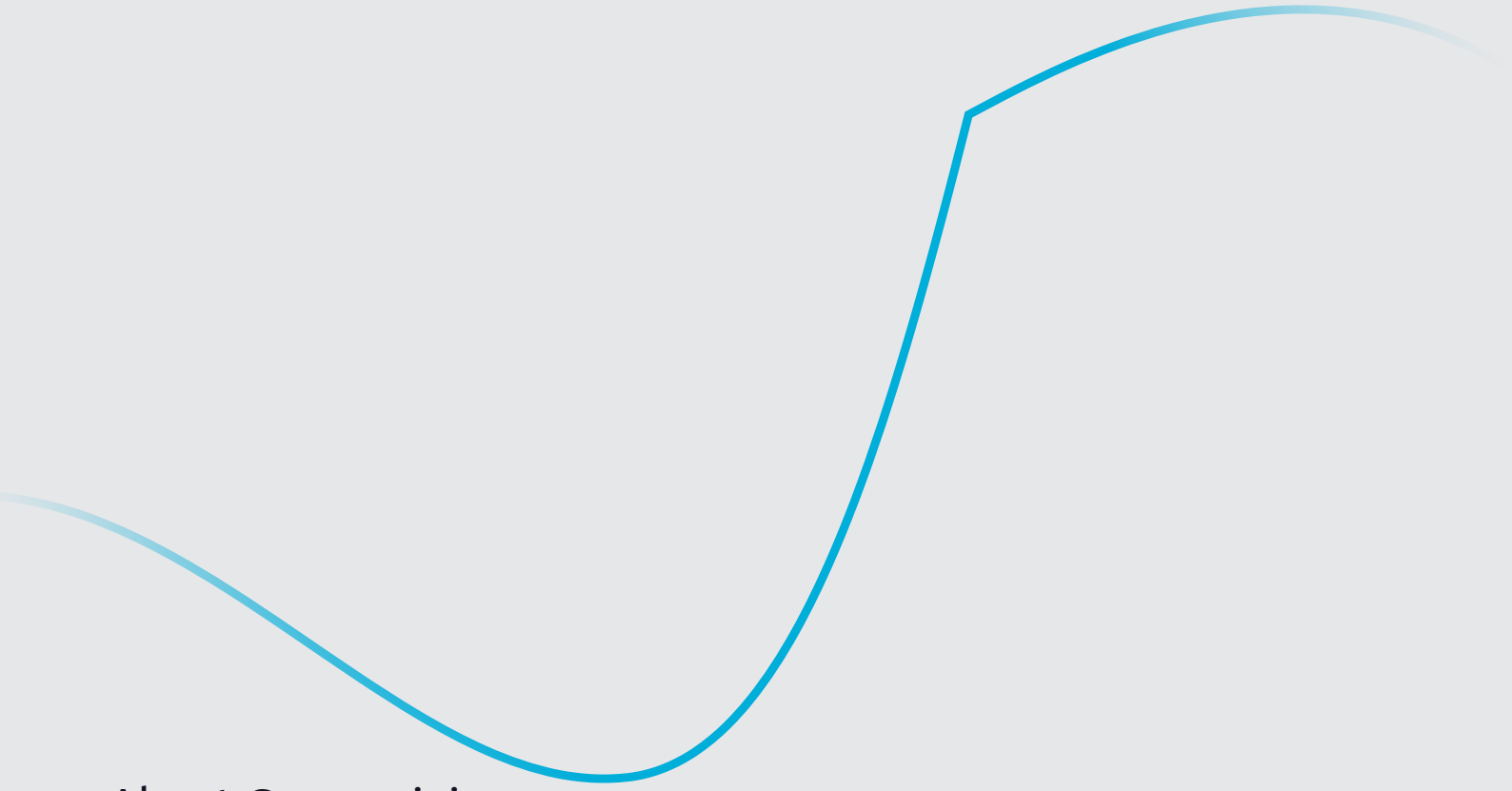

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