



# Public Goes AI

Activate data for citizen-centered public services



PRIVACY

TRUST

SECURITY

SUSTAINABILITY

## Perform AI

Activate data.  
Augment intelligence.  
Amplify outcomes.

# Introduction

At the crossroads between citizenship, political action and technology, artificial intelligence (AI) offers great potential for the public sector.

For both governments and public institutions in today's data-driven world, embracing AI is at once an opportunity and a duty. Mastering data is essential if we are to achieve the full potential of augmented government, intelligently automating administrative processes and gaining insights to enable better overviews and better decisions that have a positive impact on the citizen.

As part of this, embracing AI is essential to keep up with new societal and industrial standards that rely on complex sets of data.

In the move toward progress, public institutions and governments will be at the frontline of this technological journey while being guardians of its ethical and lawful use.

Whether it be detecting tax evasion, predicting crimes, or accelerating the attribution of social benefits, artificial intelligence is a powerful companion for all kinds of public services. We see four main fields in which AI will deeply impact the public sector:

**1 The intelligent automation of administrative processes** – by making end-to-end automation possible, AI will enhance the ability of public institutions to respond to the heavy burden of documentation and citizen case management, thereby reducing costs.

**2 The interaction with citizens and state employees** – with human-centered AI, technology will revolutionize the citizens' experience and the way they interact with public institutions.

**3 Detecting anomalies** – AI can monitor streams of transactions tirelessly day and night and alert law enforcement to potential fraud and other anomalies.

**4 Helping in the decision-making process** – based on insights gleaned from complex sets of data, AI can augment various state employees in their tasks and decisions.

This Point of View highlights these four main fields of the use of AI in the public sector based on several use cases across a wide range of fields: Welfare, Public Administration, Tax & Customs, Security & Defence, Healthcare. It furthermore provides insights on the bigger picture vision:

- Ability to **answer the ethical and regulatory requirements** around the use of AI.
- Propose an overview of various technology partners **to engage** within AI use cases (universities, startups, software partners).
- Ways of **transforming the organization's structures** via the use of AI and to **bring in the human** within this journey towards mastering data.

## Our Experts

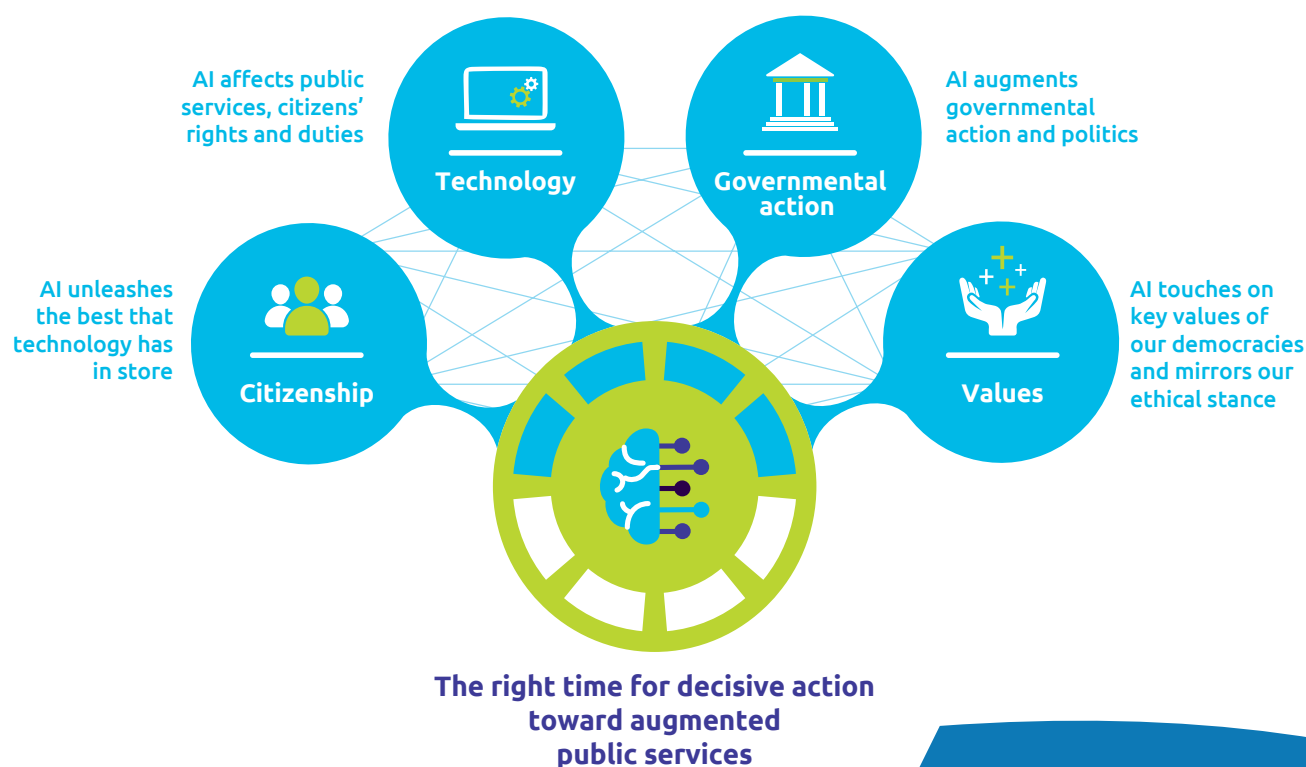


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**Graph 1: AI at the crossroad of several dimensions**



At the crossroads between citizenship, political action and technology, artificial intelligence offers great potential for the public sector.

# In data we trust – Taking the robot out of the human

## Augmenting, not replacing

In the quest to realize AI's promise of a digital twin, governments around the globe have been emphasizing one key aspect of the technology – the “democratic requirement”<sup>1</sup>, which mandates that AI should act “for humanity”<sup>2</sup>, “for all”<sup>3</sup>, and constitute an approach that “benefits people and society as a whole”<sup>4</sup>.

As a global player on the technological stage, Capgemini fully echoes this human-centered approach in its work for the public sector, committing to the leitmotiv of an AI for good, serving the citizen and augmenting public services. Indeed, this understanding of the relationship between AI and the human constitutes the foundation of our key AI framework, Perform AI (see Graph 2).

In contrast to the fantasy world of the *Terminator* movies, building a strong AI is actually about leveraging a technology that augments the human in a structural and functional way. Augmentation through AI means that the human and the machine must complete one another within given tasks, in full awareness, and with shared goals.

In this mission to augment governments, Capgemini's Perform AI relies on two triggers to launch the AI journey:

- First, leveraging AI as a technology to transform existing processes within the organization (AI Activate), thereby accelerating these processes and giving the human the ability to concentrate on more creative tasks.
- Second, using AI to open up new and unexpected fields of operation (AI Reimagine).



**Successful AI is an augmentation or “second me,” allowing humans to perform better. So, every engagement addresses the human dimension – proactively managing the impact of the initiative on your augmented workforce, seeking for the best interaction between human and machine, and transforming the corresponding human skills.**

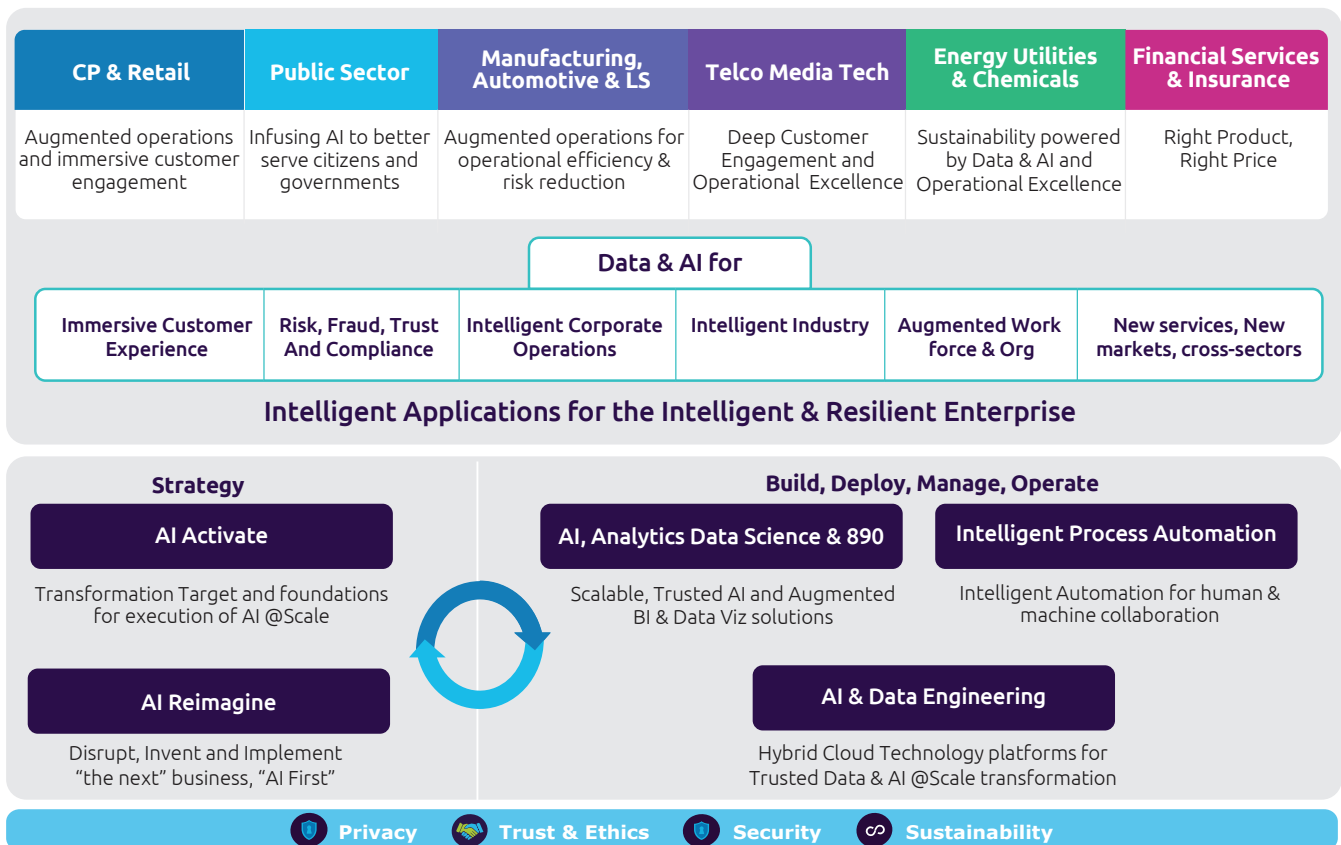
<sup>1</sup> See German AI strategy (2019), under: [www.ki-strategie-deutschland.de](http://www.ki-strategie-deutschland.de): Strategie Künstliche Intelligenz der Bundesregierung, p. 4.

<sup>2</sup> See “AI For humanity” (2019), under: [www.aiforhumanity.fr](http://www.aiforhumanity.fr).

<sup>3</sup> See Indian AI Strategy (2019), under: [www.niti.gov.in](http://www.niti.gov.in): National Strategy for Artificial Intelligence.

<sup>4</sup> European Commission (2019), under: [www.ec.europa.eu](http://www.ec.europa.eu): Communication Artificial Intelligence for Europe.

**Graph 2: The Perform AI Framework**



## The public sector's mission

The use of AI in the public sector is a specific and significant undertaking. Indeed, the technology emphasizes both the opportunity to revolutionize public services, and our societal duty to embrace progressive values. By affecting so many aspects of the way people operate with technology and industry, AI becomes a highly relevant area that state employees will need to embrace, deploy, and regulate.

In parallel to the responsibility to enable a trustworthy and responsible AI, the public sector will be able to unleash the tremendous benefits of AI in its daily activities, thereby addressing the various pain points in today's public services, including:

- The number of processes constitutes a heavy burden for public administrations, creating a bureaucracy that is challenging to master.
- The profusion of complex tasks that must be addressed by state employees in ever-shorter time spans, and often with insufficient resources.
- Society's growing requirements regarding individual rights and personalization of public services require much effort.
- Organized crime, such as fraud, violent groups, or individual radicalization, uses channels that the government may not be able to tackle without intelligent digital assistance.

Capgemini sees four main fields where AI can help the public sector tackle these difficulties:

1. The intelligent automation of administrative processes
2. The interaction with the citizen and state employee
3. The detection of anomalies
4. Data-supported help in decision-making processes.

By realizing the potential of each of these areas, AI creates room for many potential benefits in the public sector. The **first** is to master the daily workload, so that there are fewer routine-based tasks being handled by humans, and with fewer resources. **Second**, the intelligent use of data enables better support for decision makers, who will benefit from greater insight. A **third** benefit is the ability the public sector will have to meet very individualized needs within the administration system, such as in a social benefit context, with AI connecting administration and society on a surprisingly high level of personalization. **Last but not least**, AI can provide the key to keeping up with the standards used in the private sector, thereby making the most of what current technology has to offer.



# Demystifying AI – Which technologies lie behind AI

Providing a definition of AI is never easy, as the concept lies at the crossroads of many pre-existing technologies. Nevertheless, it seems crucial to establish a reference of what Capgemini understands as AI, with a special focus on two aspects:

- **Intelligence** – underscores the self-learning aspect of the technology, which enables the highest level of automation and of knowledge gain in a given context
- **Artificiality** – points out the often-forgotten fact that AI is still not human; it is driven by machine learning rather than human learning processes.

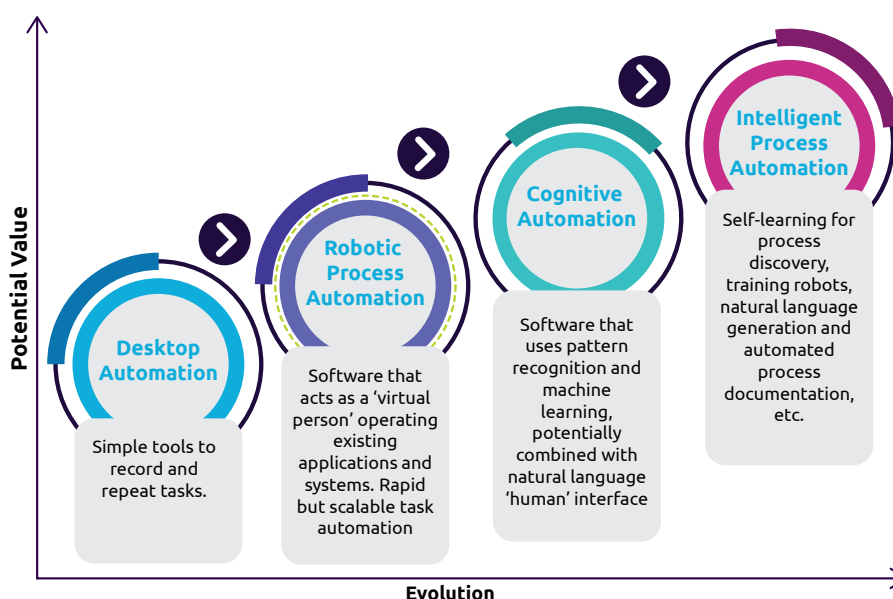
These artificially intelligent self-learning methods rely on pre-existing technologies to create a multi-layered AI-cocktail. For instance, by applying intelligent algorithms to automation, the golden triangle of

robotic process automation (RPA), artificial intelligence, and smart analytics can enable the move to intelligent process automation<sup>5</sup> (IPA, see Graph 3). Another instance of AI is the move from basic analytics to advanced analytics, unblocking prescriptive and predictive potential (see Graph 4).

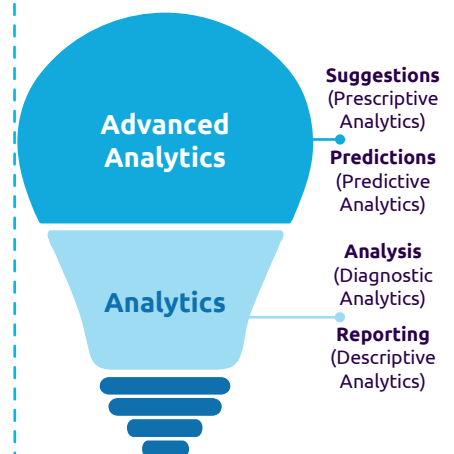


**AI is the collection of capabilities and behavior by learning systems that are perceived by humans as intelligence.**

**Graph 3: From RPA to IPA**



**Graph 4: From Analytics to Advanced Analytics**

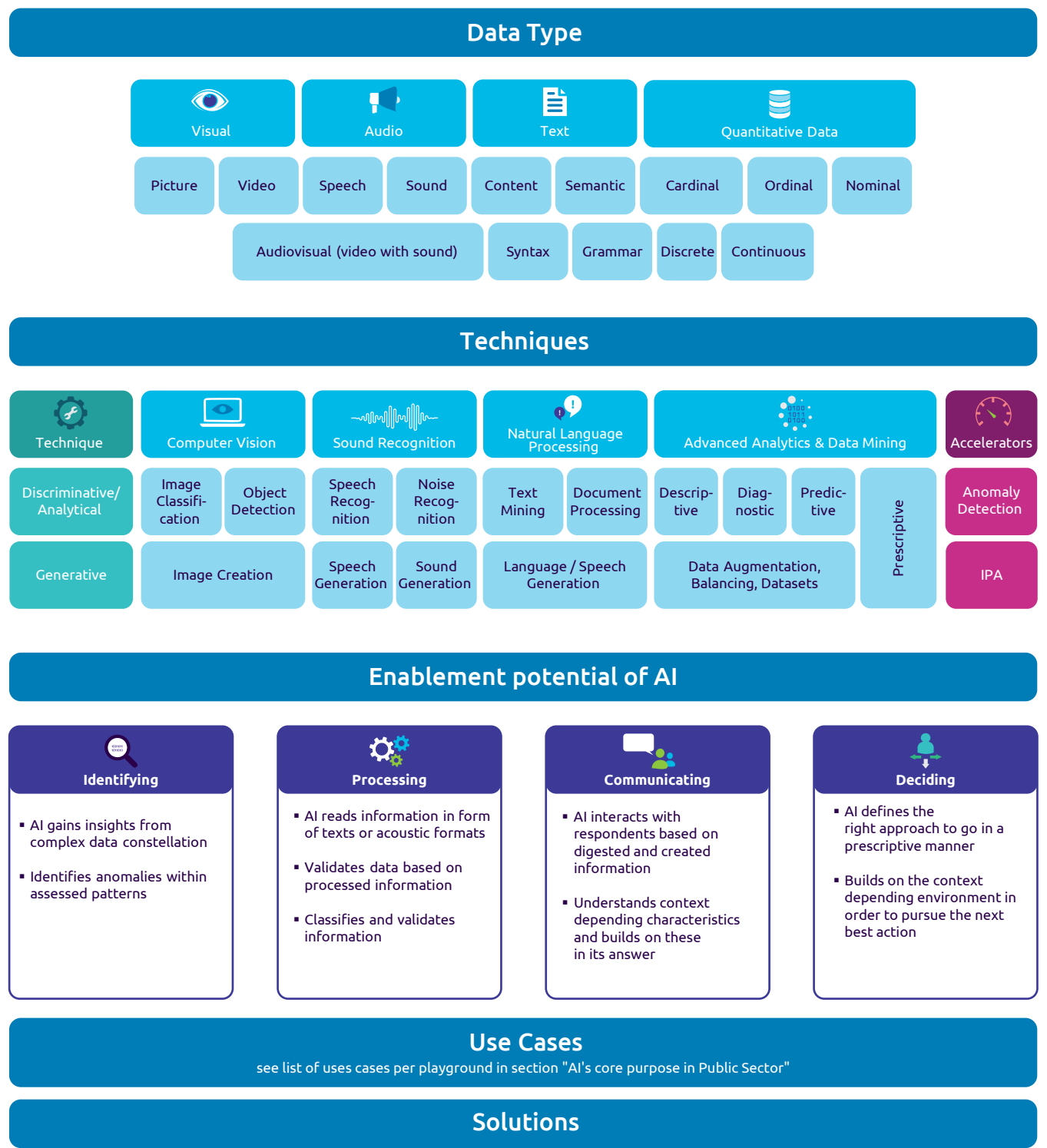


<sup>5</sup> See Capgemini's offering "Intelligent Process Automation" under: [www.capgemini.com](http://www.capgemini.com).

<sup>6</sup> Public Goes AI – Activate data for citizen-centered public services

Furthermore, the following AI-driven technologies are central to the technology’s potential: natural language processing (NLP), computer vision, sound recognition, advanced analytics, and anomaly detection.

Graph 5: The technological framework behind AI



# AI's core potential in the public sector

As stated above, Capgemini addresses four main fields in which AI enables an augmented public sector: intelligent automation of administrative processes, interaction with the citizen and state employee, detection of anomalies, and data-supported help in decision-making processes.

## 1. The intelligent automation of administrative processes



### Why is it a game changer?

Public authorities from nearly every sector are confronted with copious documentation tasks, and have to handle scores of administrative processes such as forms, complaints or requests. When dealing with these citizen cases, very often relevant information is spread across different documents, processes and with different formats, both structured and unstructured, which in turn must be managed within given deadlines and periods. Alongside these extensive levels of information, data analysis is complicated by the need to verify the authenticity of information and identities before it is further processed. What's more, data analysis is embedded in an overall process with various actors involved, which have to be consulted within pre-defined structures.



### How does AI enable a solution to the problem?

AI-based reading and automating tools can make administrative processes more efficient through intelligent automation, which in turn leads to cost reductions and time gains when handling administrative processes such as documentation and case management. Advantages for citizens are shorter processing times and location-independent communication with public authorities. AI enables the organizing, reading, validating, and allocating of requests and information to deliver intelligent end-to-end process automation. With routine tasks in particular, AI is predetermined to support the human in the task fulfillment, which enables the state employees to focus on cases that require specialist knowledge. Moreover, it helps the institution on its automation journey towards a Digital Public Organization Model<sup>6</sup>.



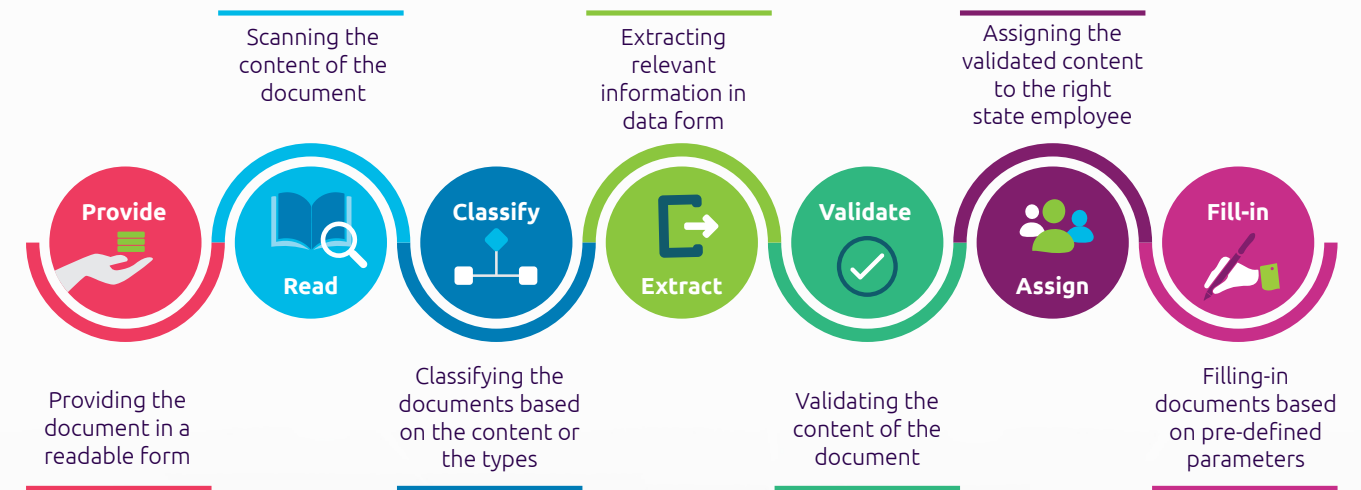
### Which technology comes into play?

- AI uses computer vision technologies to translate images into machine-readable text. These include optical character recognition (OCR) or ICR, text analytics, and IPA to automate administrative processes.
- Text analytics enables the processing of the document's content, using natural language processing, for example, and especially text mining and document processing technologies.
- Furthermore, IPA provides an end-to-end perspective of a sustainable and scalable automation of case management.

<sup>6</sup> See Capgemini's offering "Digital Global Enterprise Model" under: [www.capgemini.com](http://www.capgemini.com).



Graph 6: The six different stages of automizing documentation



**Graph 7: List of use cases for “The intelligent automation of administrative processes”**



## Real-life success story – Intelligent case management for citizen services



## 2. The interaction with the citizen and state employee



### Why is it a game changer?

In an ever-more individualized society, citizens increasingly reach out to their state employees to request public services. They expect the same kind of customer service they get from the private sector – in other words, channel-, location- and time-independent availability. This 24/7 expectation puts public authorities under pressure to manage processes efficiently and leverage resources for complex and important tasks all while ensuring data security, data privacy, and confidentiality.

In parallel, state employees often have burning questions arising from the complexity of some citizen cases they deal with, and often miss viable ways to address them at short notice.



### How does AI enable a solution to the problem?

Conversational AI improves the interaction with the citizen or state employee, functioning as a virtual assistant through a text- or voice-based dialog system. AI helps improve chatbots by making them more “human,” using natural language, and enabling continuous learning during the interaction process, thereby enhancing the citizen experience. When used in direct interaction with the citizen, chatbots facilitate the location- and time-independent availability of public services<sup>7</sup>.

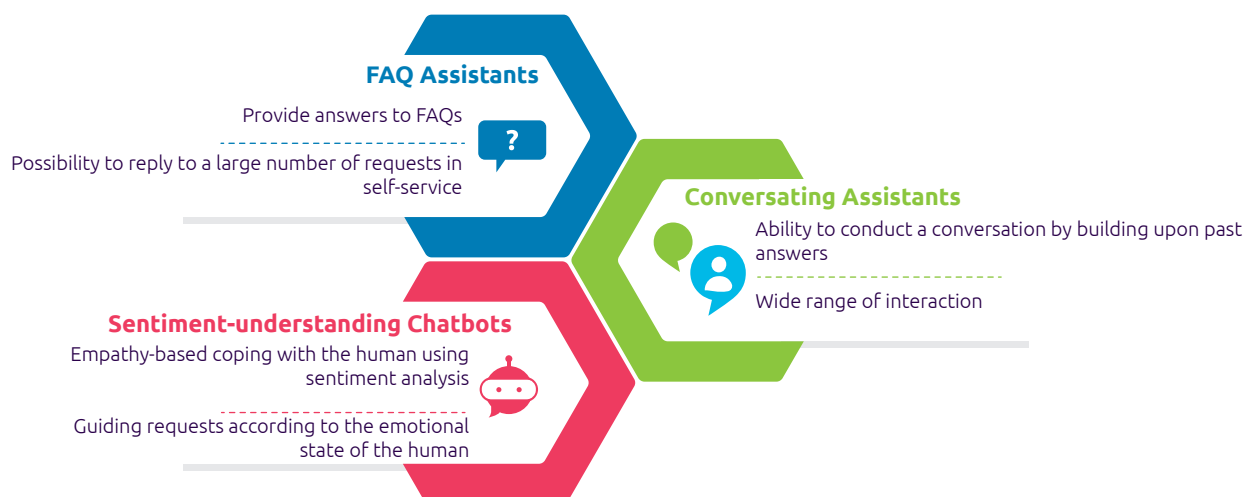
Further, additional features such as multilingual capabilities can be included. Within the public sector, chatbots can support state employees and citizens in other ways, such as finding relevant information.



### Which technology comes into play?

The technology behind chatbots comprises language understanding, language creation, and processing techniques. In the overall interaction process, different components and techniques go hand in hand: when receiving requests from humans, NLP is essential for AI to pursue the request using analytics and text mining techniques. In interacting with the citizen, language creation techniques prepare the output of the AI in a comprehensible manner.

**Graph 8: The three stages of conversational AI for human-centered interaction with citizens and state employees**



<sup>7</sup> See Capgemini's Offering "AI in Customer Experience" under: [www.capgemini.com](http://www.capgemini.com).

**Graph 9: List of use cases for “The interaction with the citizen and state employee”**



## Real-life success story – Service-guiding chatbot for improved citizen experience



### 3. The detection of anomalies



#### Why is it a game changer?

In a poll, 61% of companies stated that AI is vital to identify critical threats<sup>8</sup>. This could also apply to the public sector, where various anomalies (structural or punctual, directly visible or otherwise) must be identified in real time in order to cope with potential threats. The challenge for the public sector is to identify a detection mechanism of anomalies that works in real time and with the best possible precision, while conforming to jurisdictional requirements.



#### How does AI enable a solution to the problem?

AI enables the identification of anomalies using various types of data that can be numerically-, image-, audio- or text-based. Based on the existing data pool, AI can, crucially, detect patterns suggesting immediate cases of danger or unlawfulness. Furthermore, AI can detect all kinds of anomaly stages, whether they are suspicions, an identified threat, or an incident occurring. The more data that is available, the better the quality of the AI in detecting anomalies or situations of danger.



#### Which technology comes into play?

- Computer vision and NLP in order to identify patterns in images, audio or texts.
- Anomaly detection applied to NLP or advanced analytics in order to accelerate the identification of outlier data.

<sup>8</sup> Capgemini Research Institute (2019), under: [www.capgemini.com](http://www.capgemini.com)  
Reinventing Cybersecurity with Artificial Intelligence, under: [www.capgemini.com](http://www.capgemini.com).



**Graph 10: List of use cases for “The detection of anomalies”**



## Real-life success story – AI to combat VAT carousel fraud





## 4. Data-supported help in decision-making processes



### Why is it a game changer?

There are many public sector institutions that need to take sensible decisions based on insights they must analyze and consider. Often, the number of relevant variables is immense, and relies on interdependences that are almost impossible to track by the human eye. This gets even more difficult when the decision-making process must be in real time, leaving no time for decision makers to study a given context in depth.

Considering the bigger picture, public service organizations often face an immense pool of internal and external data, without being completely able to harness its full potential.



### How does AI enable a solution to the problem?

AI can be used to intelligently build on available data to support the decision-making process by offering the political-administrative decision makers with advanced courses of action. The amount and accessibility of data, indeed increases the likelihood of data-driven or evidence-based policy-making. Employing AI in the decision-making process can help to identify changes and to enable long-term observation of phenomena.

AI can help to anticipate certain development trends, enhancing the long-term planning of political measures. Moreover, patterns in data can be detected, connections determined and processes depicted, which enables the fact-based assessment of circumstances created by certain changes. In short: AI can reduce uncertainties and complexities and deliver predictability, and can thus help find accurate solutions for the societal challenges of today and tomorrow. It is crucial to underline that AI here only gives prescriptive suggestions for decisions, with the human remaining sovereign in decision-making power.



### Which technology comes into play?

- The underlying technologies in the decision-making process are advanced and predictive analytics.
- Advanced analytics can function for decision makers as a source of information, as an instrument for the performance review of measures, as an instrument for predictions, and as a means of optimizing administrative processes.

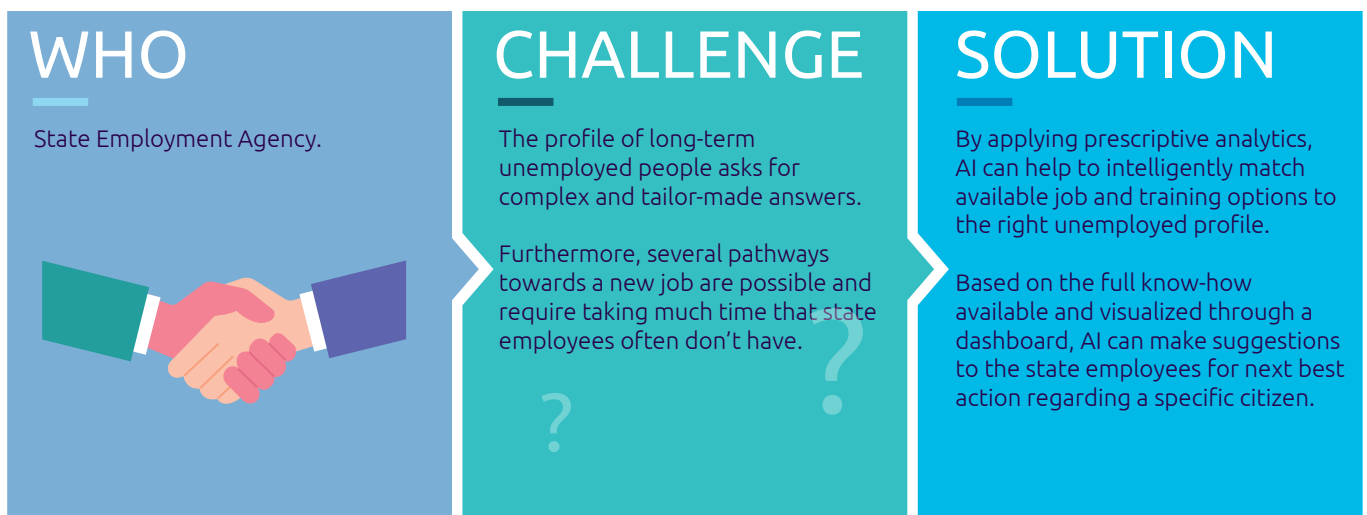


**AI can reduce uncertainties and complexities and deliver predictability, and can thus help public organizations to move from identifying issues to resolve these before they occur.**

**Graph 11: List of use cases for “Data-supported help in decision-making processes”**



## Real-life success story – Augmented job allocation



# Avoiding the Death Valley on the way to AI

In this early stage of public sector efforts to adopt AI, organizations must be very careful about seeing the bigger picture of their journey. Four common errors, in particular, still lead to many AI projects failing before they reach maturity:

## *Death reason I – AI without clear outcome:*

What is the concrete outcome expected from the use of AI in a particular use case? If the answer is unclear, it probably means that the project is going nowhere. AI projects need a clearly defined and real-life purpose, a measurable outcome that needs to be defined from the start (key success measures), if they are to avoid the trap of AI hype.

## *Death reason II – AI without scalability:*

AI needs to be thought on several dimensions, including data governance and structures, way beyond the sole technology to be applied. If this technological castle is built on sand, it won't survive for long. Too often, AI prototypes are built on technology modules that are

limited to their prototype environment and therefore cannot scale. They end up trapped by a highly complex context or a badly conceived engineering model, or they have to wait for too long for the IT landscape to be ready to have them run at scale.

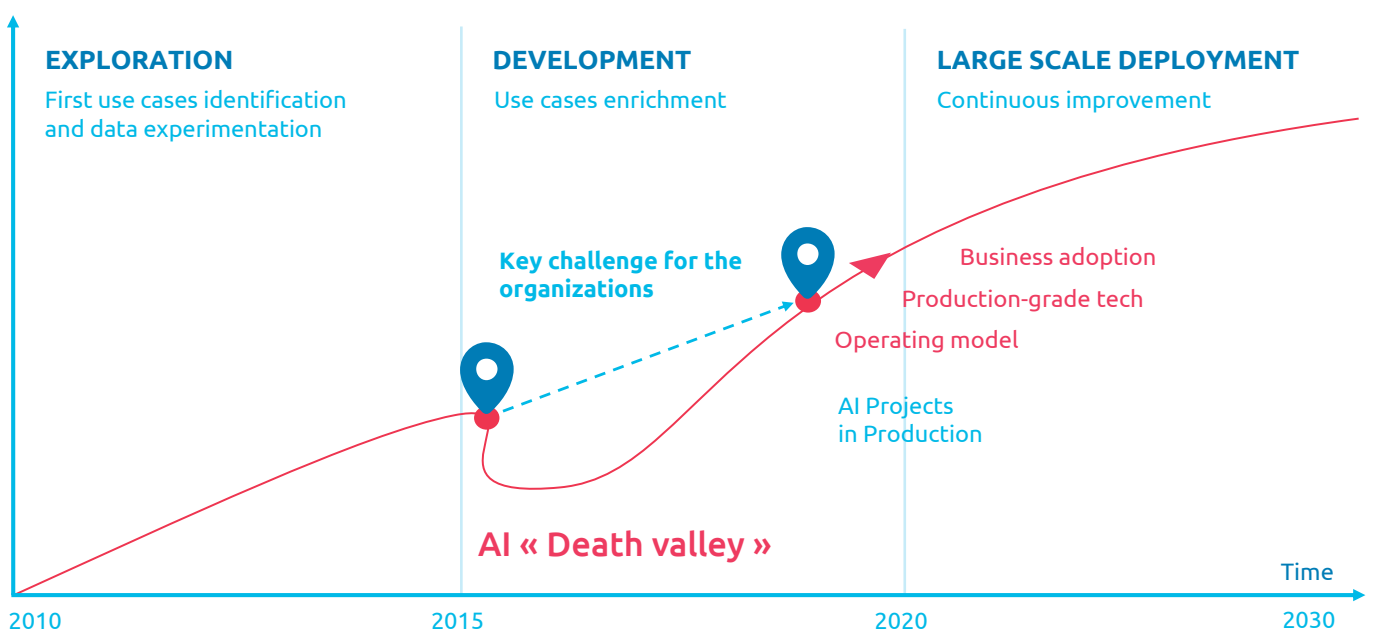
## *Death reason III – AI without data:*

Just as for the infrastructure, the data itself is also crucial to any AI project. An AI journey starts with qualified, trusted, available data on which the case efficiency depends. Especially for applications in the public sector, examining potential bias in training data sets will be key to success.

## *Death reason IV – AI without humans:*

A last trap into which AI projects can fall is to forget to define the human's place within this new, AI-enabled world. Humans must be at the center of this technological revolution, and any project that doesn't rely on their trust and acceptance will quickly be doomed to fail.

**Graph 12: AI needs EXECUTION to bridge the AI death Valley and SCALE**





**Capgemini ensures a clear impact and risk assessment, providing a code of conduct within the data scientist project roadmap. These setups further continuous governance, awareness, and oversight of ethical issues, depending on contextual aspects of a specific case.**

## 4.1. Defining and building an ethical and lawful AI

Building on trustworthy AI means organizations also need to consider the ethical and lawful dimension of the technology. This is an issue of quality, but also of trust for citizens and institutions – indeed, “62% of customers will trust more companies if AI is perceived as ethical,” while “41% of executives are likely to abandon the system altogether when ethical issues are raised<sup>9</sup>.” Capgemini addresses the matter in multiple ways.

The first is by leaning on the emerging regulatory framework and definition of concrete guidelines and principles edited by the High-Level Expert Group of the EU<sup>10</sup>. Indeed, following the Capgemini study inspired by the EU’s guidelines, projects must promote the transparent, auditable, explainable and fair use of AI<sup>11</sup>.

Two guiding principles are to be emphasized regarding the approach of these guidelines. First, the essence of this debate must be to raise general questions while providing case-specific answers. How accountable is

my AI? How fair is my case, based on which variables? Indeed, depending on the case, the answer can be different: while a self-driving car should have 100% efficiency, an AI-driven decision-tool in disease detection with just 35% additional efficiency might represent huge progress when compared to previous, non-AI methods.

Second, organizations need to keep in mind the data centrality of the AI debate. Nurturing public services with correct, big, open, and fair data will be crucial in order to ensure a healthy AI. This is particularly important for the public sector, as personal and citizen data will be at the core of AI processes.

Beyond the ethical dimension of AI, the lawful dimension also plays a decisive role within the overall approach. With laws and regulations such as the General Data Protection Regulation (GDPR), a regulatory framework is given to AI, providing clear guidelines but also enabling a better approach towards data: “The principle of accountability enshrined in the GDPR is set to foster the accuracy of data. [...] Data quality, as fostered by the GDPR, is crucial<sup>12</sup>.”

Also, while promoting AI ethics is essential, implementation is just as important. Hence, the tooling of ethics should be practicably considered during the AI whole lifecycle, and should be addressed through a wide range of operational setups and technical assets. This applies to both aspects of ethical and lawful AI, and is of great importance for any public service dealing with the population in all its pluralism.

With the embedding of operational setups, Capgemini ensures a clear impact and risk assessment, providing a code of conduct within the data scientist project roadmap. These setups aim at guiding toward a continuous governance, awareness, and oversight of ethical issues, depending on contextual aspects of a specific case.

With the use of technical assets, Capgemini implements a governance of trust through assessment tools. For instance, algorithm maturity tools can analyze whether a certain data set contains a bias based, for example, on identified minorities.

Read more on Ethics in AI under:  
[www.capgemini.com/service/trusted-ai/](http://www.capgemini.com/service/trusted-ai/)

<sup>9</sup> Capgemini Research Institute (2019), under: [www.capgemini.com](http://www.capgemini.com): Ethics in AI executive and consumer survey.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> European Commission (2018), under: [ec.europa.eu](http://ec.europa.eu): The Age of Artificial Intelligence, in: EPSC Strategic Notes, Issue 29.



An AI-driven public sector must always following one central idea – to place and take the human in the heart of this data journey.

Graph 13: Trusted AI - Operationalization aspects



## 4.2. Building on a strong data governance

Ensuring a robust AI starts with the fundamentals, with sustainability that is dependent on a strong data infrastructure. For this to happen, Capgemini has conceived its AI & Data Engineering solutions, which consist of foundation services that provide the right data and AI-managed platforms to deliver trusted AI solutions in production and at scale. This modern enterprise data and AI platform relies on the following layers, all fed by internal and external data:

- Platform Foundation
- Data Centricity Foundation
- AI & Analytics Foundation
- AI & Analytics Execution
- Data Governance Strategy and Process

In the public services' pursuit of pragmatic and scalable AI cases, AI & Data Engineering will empower organizations in the public sector to move from a process-driven model to a data-first model.

Read more on the "AI & Data Engineering" offering under: [www.capgemini.com/service/perform-ai/](https://www.capgemini.com/service/perform-ai/).

## 4.3. Beyond the technological race – bring in the human

We must never forget who stands behind and benefits from AI-driven solutions for the public sector – the human, and indeed society as a whole. AI projects therefore need to embed a change management component at the core of the client's organization. This must happen on two fronts:

- The first is by combining the technology with the client's organizational governance. AI cases must fit AI-friendly structures within the organization, in order to adapt the institution's decision-making processes with accelerating solutions such as AI. Without that effort, the new technology's potential gets lost, trapped by the absence of crucial change management.

- The second is by assuring that AI is trusted and embraced, not only by the decision makers, but also by those using it, be it a state employee in his/her work, or a citizen seeking guidance. For this to happen, awareness must be created and nurtured over time, bringing the human and the digital twin together to provide greater public services.

## 4.4. Co-creating the AI journey – building on a strong partner ecosystem

AI work environments "should offer collaboration between researchers and startups, larger companies and organizations, as well as society at large, encouraging researchers in academia to collaborate with industry and the public sector." Capgemini embraces this idea, and sees the AI roadmap as a collaborative journey bringing several key players onto the pitch:

- Startups – at the peak of innovation waves, Capgemini builds on a strong relationship with startups through the Capgemini Applied Innovation Exchange network as well as through Capgemini Ventures, mixing their agility with a goal for implementation at scale.
- Universities – as living lab infrastructures, universities are at the crossroads between technology, research, and a tech-savvy population. Their involvement in the AI journey brings a highly valuable academic perspective.
- Technology partners – With the richness of their offerings and solutions in the field of AI, software and hardware partners are long-term companions Capgemini sees as essential actors in the fulfillment of the AI mission in the public sector.

There is no doubt that artificial intelligence will be a key to public services in an ever more digitalized world. Embracing its disruptive potential will require clear goals, principles, foundations and partners. In this process, an AI-driven public sector must always follow one central idea – **to place and take the human in the heart of this data journey.**



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## About Capgemini

Capgemini is a global leader in consulting, digital transformation, technology and engineering services. The Group is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year+ heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. Today, it is a multicultural company of 270,000 team members in almost 50 countries. With Altran, the Group reported 2019 combined revenues of €17 billion.

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