THE INTELLIGENT ENTERPRISE IN THE EXPERIENCE ECONOMY FOR THE PUBLIC SECTOR

Preparing for a government organization that is foresighted, citizen focused, and agile

THE BEST RUN SAP

"Public sector organizations are becoming intelligent enterprises by applying advanced technologies that include machine learning, the IoT, and analytics within integrated, agile business processes. Intelligent enterprises turn insight into action. In today's experience economy, it is vitally important that processes are driven by a clear understanding of the experiences that constituents expect."

Martin Klein
Global Vice President
Public Sector
SAP SE

WELCOME

The world is accelerating at a strikingly fast rate, while the core mission of the public sector – to protect the community, provide services, and help the economy prosper – remains firmly in place. The challenge of keeping up while still meeting your primary responsibilities is no simple task.

For public organizations, success is measured not only by the financial return on investment but even more so by the political and social return. Failure is expensive: unsafe or unhealthy communities, degraded citizen services or lack of services, economic or political irrelevance, and loss of power or reputation.

The public sector must undergo its own changes to keep up with rising constituent expectations for service, convenience, and data protection. People are experiencing innovative, personalized, and speedy digital business models such as Amazon and Uber and expect the same experience with government. To continue to fulfill its mission, government must embrace technical, cultural, and organizational change to be more responsive, adaptable, and transparent.

The path forward is challenging. Trust in government is at near-historic lows, while constituent needs continue to grow. A global trend toward nationalism is reversing the benefits of global policy frameworks. Cybersecurity is quickly moving to the top of the list of risks to manage.

Simultaneously, as citizen expectations climb, political differences have created an atmosphere of extreme skepticism, making cooperation between agencies – and the data sharing that could result – increasingly more difficult.

We have identified three strategic priorities that will keep governments moving forward:

- Put the citizen at the center
- Leverage data as an asset
- Reimagine business processes and models

By 2025, we expect the public sector will be more proactive, automated, data driven, and citizen focused.

Governments will adopt a data-driven culture to increase evidence-based policy and program decisions. Success requires building an internal culture that values sharing data and a communication strategy that shows both internal and external stakeholders the policy benefits that come from using data effectively. One by-product of evidence-based policy making will be an increase in constituent trust.

Governments at the federal, state, and local level will adopt new services models. They will become service orchestrators and information brokers rather than direct service providers.

To get there, governments must share data across agencies, embrace emerging technologies, and work directly with their constituents to rebuild trust. They can fuse human experience data with operational data to listen, understand, and take action; create a better citizen experience; and meet the expectations being set by the private sector.

The most successful public agencies will be those that reimagine their end-to-end business processes using technologies based on open standards. These agencies will shift routine tasks from humans to business systems using intelligent automation and, as a result, attract and retain talented employees. They will commit to their own transformation.

This paper takes a deep dive into the trends shaping the public sector over the next five years and the path to innovation. We propose a set of priorities that will drive transformation and the tools that will make it possible.

The mission of the public sector is resolute. When governments put their citizens at the center, they can honor this mission and inspire transformational thinking.

Sincerely yours,

Martin Klein
Global Vice President
Public Sector
SAP SE

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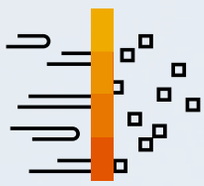
OUR PLACE IN THE NEW WORLD

While there is no one-size-fits-all solution for the transformation of government, there is a set of common challenges that they all must overcome. Principally, governments must win the trust of an increasingly skeptical constituency whose expectations are rising based on service they receive from the private sector. The need for sustainable solutions, exacerbated by the migration of populations to cities and the global trend toward protectionism, all ratchet up the pressure for governments to become more agile. And, of course, governments must guard against cyberattacks to earn and keep their constituents' faith.

In response, public organizations must include data and business intelligence as a strategic priority and a valuable asset. They must invest in emerging technologies, with a focus on open standards-based technologies that support the strategy.

Forward-thinking public organizations see a virtuous cycle in the transformation. Those who can leverage data to inform better policy decisions – and who are transparent about the process – will win the trust of their citizens and gain access to more and better data to inform policy making going forward. But to get there, government agencies must break down organizational silos that often restrict data sharing, and they must invest in new technology without undermining the legacy systems that are still the backbone of many public organizations.

It is no small task.



Digital strategies are disruptive and changing the rules of the public sector.

The City of Antibes in France monitors its water distribution infrastructure through sensors; securely transmits the mountains of data collected to SAP® Cloud Platform; and analyzes it using the SAP Leonardo® Internet of Things solution. The results are improved constituent services with water infrastructure breakdowns avoided, maintenance schedules optimized, and costs saved.

With intelligent technologies from SAP, the government of South Tyrol in Italy created a prototype to verify citizen data using blockchain, to eliminate the need for citizens to enter their information multiple times when working across government agencies.

With Experience Management solutions from SAP, the American Society of Health System Pharmacists (ASHSP) can "respond to all requests and make more of an impact on the organization, as well as think of new ways to use Qualtrics for data collection of all kinds. It makes a huge difference to have centralized data and an enterprise tool with advanced features and secure, role-based access. And the great customer service at Qualtrics makes them feel like a 'partner' rather than simply a vendor," says Colleen Bush, Manager of Market Research at ASHSP.[1]

BUILDING A MORE RESPONSIVE GOVERNMENT

In 2025, we expect the public sector will be more proactive, foresighted, and automated. It will be data driven and citizen focused.

The most successful government agencies in 2025 will manage a balancing act. They will meet their core responsibilities to provide security, economic opportunity, and services while reimagining the ways they serve. They will change their business models to become service orchestrators and information brokers rather than direct service providers, and they will adopt a data-driven culture to make better-informed decisions.

The most progressive public agencies will exhibit a new level of transparency, making data available to citizen developers to enable them to create new applications for their communities and providing increased visibility into how tax dollars are being invested. One such government is the State of Indiana, which provides data and analytics to citizens through its Management Performance Hub.

Responsive governments will open new channels of communication with their constituents to increase the flow of information. In 2025, the most open governments will have fully integrated, conversational user interfaces to help citizens with questions, in the same way the United States and Australia today assist their citizens with immigration services and taxes. They will use experience data – feedback from constituents, employees, and stakeholders – to better understand the people they serve, drive innovation, and improve government services. Government agencies will redefine their core processes for taxes, services, social protection, and public security. They will automate standard tasks to free employee time.

Agencies are putting predictive systems in place to allow them to be more proactive. One agency working toward this vision is the Queensland Office of State Revenue, which is using machine learning to predict which taxpayers may become debtors – with an accuracy level greater than 70%. (This accuracy will increase as more data sources are added.)

With governments becoming massive repositories of integrated data, the risk from cyberattacks will continue to grow. Public agencies have a special responsibility to guard their constituents' data.

We believe that business model innovation and process optimization are the by-products of government agencies that think first about their citizens' experiences. The governments that deliver the best experiences will reap the rewards – increased trust, increased access to data, and better, more efficient policy outcomes.

150 million

By 2022, 150 million people worldwide will have a blockchain-based digital identity tied to their mobile devices – offering access to government, healthcare, and financial services.[2]

45%

By 2023, 45% of national governments will deploy edge intelligence and perform initial data processing of the Internet of Things, networks, or other devices at the point of action to enable timely decision-making.[3]

>80%

Of public sector organizations show interest in adopting industry cloud for citizen engagement services, digital government, data-driven government, and smart cities.[4]

Only 29%

Of state government employees are fully engaged.[5]

THREE PRIORITIES FOR SUCCESS

We have identified three strategic priorities necessary for public institutions to transform:

- Put the citizen at the center
- Leverage data as an asset
- Reimagine business processes and models

PUT THE CITIZEN AT THE CENTER

We expect that by 2025, leading governments will simplify complicated processes and provide more personalized, self-managed services for citizens on all channels. Organizations will employ intelligent technologies with conversational UIs for better delivery of services. Agencies will become service orchestrators and information brokers and will deliver end-to-end customer journeys across departments (see Figure 1).

To achieve the 2025 vision, organizations must adopt machine learning, conversational UIs, and natural-language processing to simplify their processes and provide personalized service. One by-product of this approach is this: with automation and personalization of core services, government employees are free to focus on the more complex services needs of citizens.

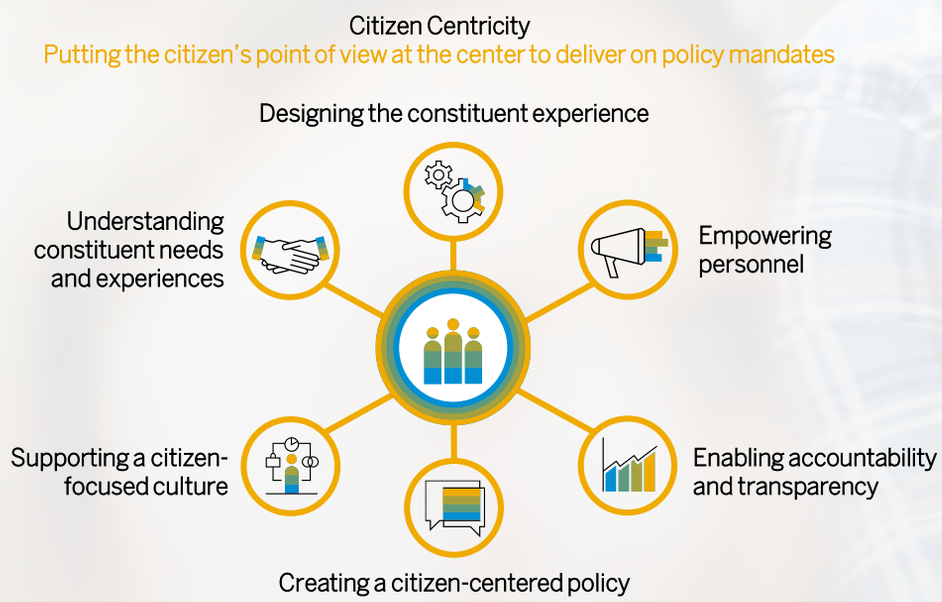
With this capability in place, the organization can begin delivering services proactively without compromising privacy and permission, rather than expecting the citizen to request services.

Government organizations can use two-way authentication, encryption, and blockchain technology to enable constituents to approve the use of their personal data.

Ultimately, governments must embrace an "only tell it once" approach, allowing citizens to own their own data and eliminating the need for citizens to provide the same data again and again.

Collecting experience data helps you better understand why things happen and the thoughts and emotions of all the stakeholders involved. Focusing on representative, real-time experience data makes it possible to get a much clearer picture of how citizens engage with government and to surface potential challenges. Combining insights from experience data with operational data explains both what is happening and why it is happening, which will help you deliver on your policy mandates. Also, shifting the paradigm from a taxpayer to a customer by enhancing the digital experience with personalized interactions and insights improves livability.

Figure 1: Put the Citizen at the Center



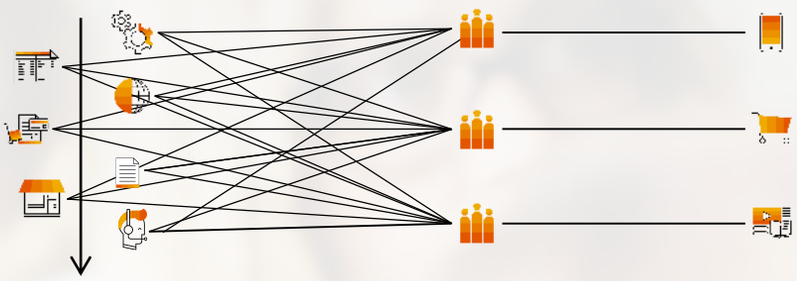
PUT THE CITIZEN AT THE CENTER

Improve Constituent Satisfaction

Radically simplify complicated processes for the citizen, providing personalized, self-managed, secure online engagement. Through this, government organizations can become anticipatory service orchestrators, information brokers, and networkers. To keep the promises you make to citizens, it is vital that you understand what their experience is.

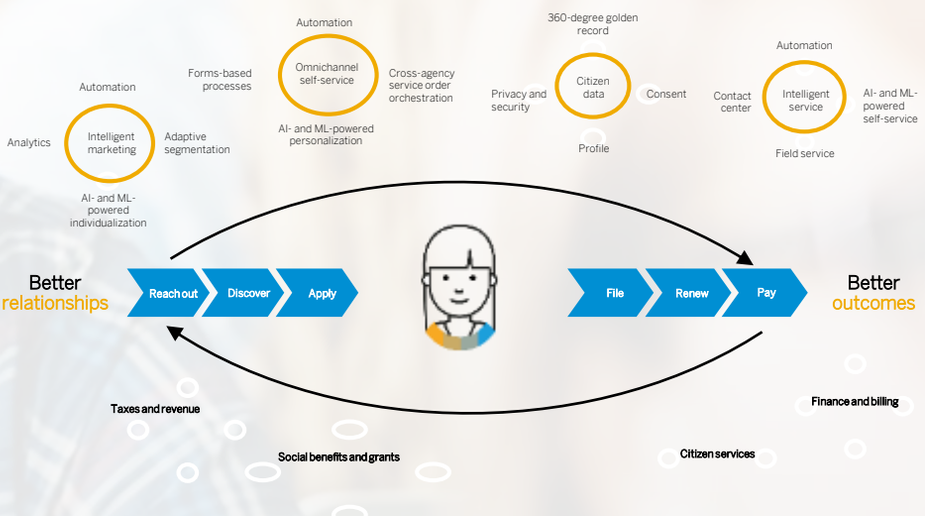
TRADITIONAL SCENARIO

- Disparate applications – such as Web content management, contact centers, and mobile apps – that do not allow for an agile response to citizen demands and may provide inconsistent information across channels
- Silos of data that create duplications for government and delays for the citizen
- Manual, disconnected processes that force citizens into bureaucratic service flows



NEW-WORLD SCENARIO

- Citizen experience is at the center of CRM.
- An integrated platform enables government to plug and play new services easily and efficiently.
- Connected data ensures a 360-degree view of the citizen and for the citizen.
- Seamless omnichannel digital services ensure personalized and convenient access.
- Operational data merges with feedback data and draws insights that are used to design even better experiences.



TOP VALUE DRIVERS

Improved constituent satisfaction

Reduced service costs

Personalized services

LEVERAGE DATA AS AN ASSET

We predict that by 2025, leading governments will integrate operational and experience data from internal and external sources to create a baseline set of facts that informs their decision-making. In addition, government organizations will make the data available to constituents, helping to build trust and foster a more fluid give and take of data (see Figure 2).

To meet this vision, organizations must start by sharing data across their own agencies to develop an integrated picture. Currently, the silos that bottle up data are perhaps the biggest barrier to meeting the vision. Once these silos are broken down, however, organizations will be able to share data and use predictive and simulation technologies to improve strategic planning and policy making.

Success in 2025 will be dependent on creating a culture that is open and transparent – one that values evidence over intuition, and one that is based on an organization-wide "single source of truth" that integrates interorganizational and external data. In addition, the most successful agencies will be those that prioritize the protection of data – at rest or in transit – from disclosure, modification, or destruction.

To better understand why outcomes and events happen and the thoughts and emotions of the people involved, you need to collect experience data. A key goal of collecting employee and citizen feedback is to empower frontline and management teams to improve performance and decision-making. Combining insights from experience data with operational data helps ensure that government employees can spend more time doing what they do best – serving the public. Delivering more effective services to citizens by adopting a data-driven strategy that enables real-time insight and analytics will drive greater public trust and engagement.

Figure 2: Create a Baseline Set of Facts

LEVERAGE DATA AS AN ASSET

Improve Constituent Satisfaction

At the heart of an intelligent enterprise is a new approach to data management. It requires the ability to do three things.

1. Integrate your diverse data sources. Data is the currency of digital transformation. Yet within most public sector organizations, data is scattered among multiple applications, files, data warehouses, data lakes, and public and private clouds.

2. Integrate your diverse data. Your data comes to you structured, semistructured, and unstructured. Data may be characterized as spatial, chart, numeric, geographic, time series, relational, or JavaScript Object Notation (JSON), for example. Integrating these different types of data is extremely complex. Yet, it's a prerequisite for becoming an intelligent enterprise.

3. Simplify your data landscape. Today, public sector organizations often lack a 360-degree view of their data and data landscape. With different databases and apps to support the organization, centralized solutions are not being used to manage it all. Public sector organizations that adopt an intelligent enterprise approach use process automation and a centralized, easy-to-use platform and interface to simplify access to data – so stakeholders at all levels can participate with data specialists in the development of creative initiatives and solutions.

TRADITIONAL SCENARIO

Departments use only their own historical data to develop policies.

Policies are made on gut feelings and stale, incomplete data.

Data in other agencies is not combined with internal data to improve insights.

New policies are difficult to embed in real-time business processes.

Customer outcomes are complicated and disorganized.

NEW-WORLD SCENARIO

A data-driven platform makes real-time data from all agencies available for policy design and decision-making.

Public policy is evidence based, leveraging multiagency data that is processed with machine learning and predictive algorithms.

Progress and outcomes can be reported in real time to make adjustments.

Citizen experiences and outcomes improve, and the new data collected feeds the agency's ability to optimize policy moving forward.

TOP VALUE DRIVERS

Improved outcomes – healthier, safer, and more prosperous citizens

Increased citizen trust

REIMAGINE BUSINESS PROCESSES AND MODELS

When customer needs are taken seriously, it becomes clear that one size seldom fits all.

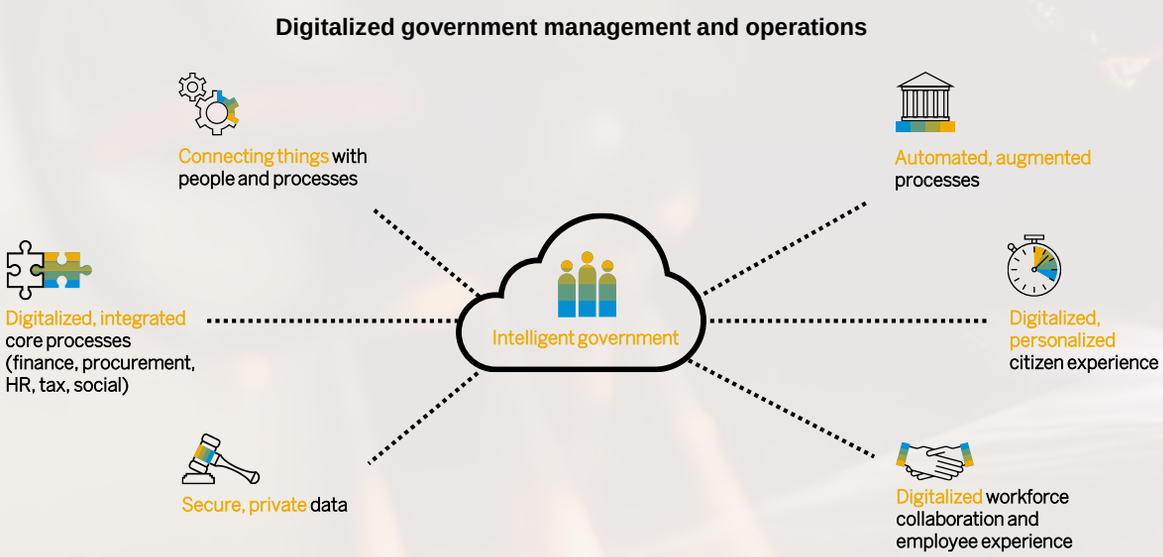
By 2025, we expect government agencies to redefine their core processes and service delivery models. With more efficient processes, governments can refocus their employees toward their specific mission. They will modernize legacy systems and lay a digital foundation for data-driven decision-making. They will automate everyday tasks so government workers can focus on the cases that require human engagement (see Figure 3).

As a big first step, organizations should automate constituent-facing services – social services, call centers, and automobile licensing and registration requests, for instance – as well as internal processes, such as invoice approvals and payment matching.

With this level of automation in place, the organization can use machine learning to personalize processes based on a 360-degree view of data – tax collection strategies based on the payment history of individuals, for example.

Once agencies are reorganized to provide higher-value services, they should establish networks of government and nongovernment stakeholders that use decentralized ledger technologies such as blockchain to power further process simplification. Gathering data from multiple sources and using advanced analytics will enable the government to intelligently deliver the right services to the right people at the right time.

Figure 3: Reimagine Business Processes and Models



REIMAGINE BUSINESS PROCESSES AND MODELS

Automate to Streamline Processes

Radically simplify complicated processes for the citizen, providing personalized, self-managed, secure online engagement. Through this, government organizations can become anticipatory service orchestrators, information brokers, and networkers. To keep the promises you make to citizens, it is vital to understand what their experience is.

TRADITIONAL SCENARIO

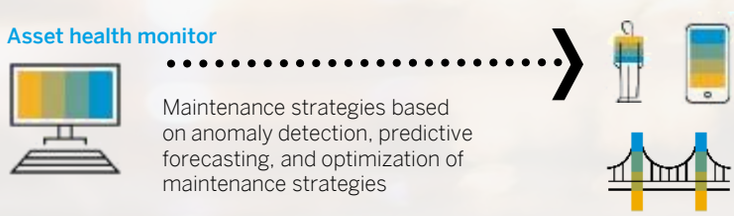
- Time- and usage-based inspection and maintenance
- Unknown real-time risk of failure and performance
- No optimization of cost, risk, and performance
- Lack of location intelligence information

Time-based inspection planning

Inspection-triggered maintenance

NEW-WORLD SCENARIO

- SAP Predictive Maintenance and Service solution for use in monitoring, scoring, and prediction of asset health based on machine learning algorithms
- Triggering of maintenance orders just in time to avoid unnecessary inspections and improve asset availability
- Combined enterprise and spatial data, creating location-aware business applications quickly and enabling critical, real-time decisions



Maintenance strategies based on anomaly detection, predictive forecasting, and optimization of maintenance strategies

POTENTIAL BENEFITS

Reduction in asset service and maintenance cost

Reduction in unplanned asset downtime

Source: SAP Performance Benchmarking

KEY TECHNOLOGIES

Artificial Intelligence and Machine Learning

Agencies can leverage machine learning to eliminate repetitive manual tasks for social services and immigration applications by automatically determining classifications, routing, and responses. Machine learning can also identify government fraud, waste, and abuse using historical and real-time data to uncover previously unseen correlations.

The Internet of Things

Connectivity, coupled with machine learning, can analyze data to manage and evaluate infrastructure, assets, traffic, and the environment. Remote condition monitoring provides real-time data from public infrastructure to predict maintenance needs. Data from sensors can help the government track water containment to reduce flooding, monitor soil for landslide risk, and help track endangered wildlife.

Advanced Analytics

Embedded analytics can provide real-time visibility into changing environments, simulate the impact to solve policy issues, and maximize the benefit of scarce public funds for everything from emergency management, transportation, crime prevention, and tax compliance to cybersecurity, emergency response, and public infrastructure.

Blockchain

Blockchain is based on distributed ledger technology, which securely records information across a peer-to-peer network. It creates a chain of unalterable transactional data that can secure almost anything of value, including land titles, constituent payments, voting records, business licenses, and customs manifests. In addition, blockchain can detect data tampering for specific transactions. An attacker will not be able to piece together the transaction, since it is dispersed among multiple ledgers and is encrypted.

Virtual and Augmented Reality

Already in use to help workers with public services activities and to train emergency management personnel, virtual and augmented reality will be used to improve transportation planning and healthcare and to provide simulated, self-guided tours to help citizens choose facilities that meet their needs.

Conversational AI

Voice interfaces will be the go-to technology for the next generation of applications. Virtual agents could help constituents with taxes, licenses, and public transportation needs as well as public safety and infrastructure issues.

Data Platform to Manage Experiences

Experience management platforms enable agencies to understand what citizens feel, think, and do every time they interact with government. This technology allows organizations to combine operational performance data from their systems with experience data from citizens and employees to get an accurate picture of each citizen's experience.

~50%

Of new mobile apps use voice as a primary interface, and 50% of the consumer-facing G2000 will use biometric sensors to personalize experiences by 2020.[6]

50%

Of servers will encrypt data at rest and in motion. Over 50% of security alerts will be handled by AI-powered automation, and 150 million people will have blockchain-based digital identities by 2022.[7]

57%

Increase, on average (from 2018), of the contribution of machines and algorithms to specific tasks by 2022.[8]

US$1.2 trillion

Worldwide technology spending on the Internet of Things (IoT) by 2022.[9]

40%

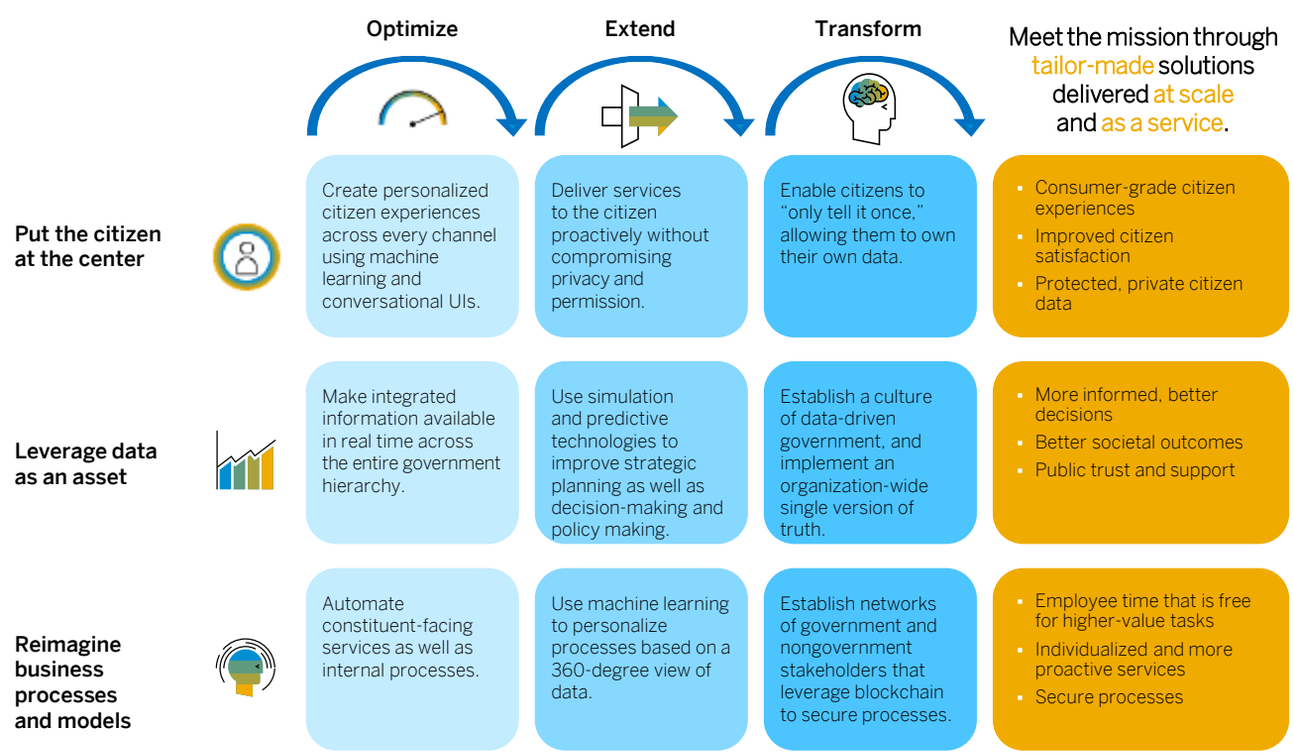
Of digital transformation initiatives will use AI services by 2019.[10]

GETTING THERE: A PHASED APPROACH

Public agencies will become intelligent enterprises on three distinct tracks as they evolve their strategic priorities. They will:

- Optimize what they already do by implementing a stable and scalable digital core to make processes more transparent and integrated.
- Extend their current processes by connecting them to the real world using IoT technologies.
- Transform their business using a constant stream of data, enabling new service-driven business models (see Figure 4).

Figure 4: Evolve Strategic Priorities



SAP'S FRAMEWORK FOR THE INTELLIGENT ENTERPRISE IN THE EXPERIENCE ECONOMY

Most organizations understand what is happening in their business, but they may not always know why.

They know what's happening because they have systems that capture operational data – about their customer transactions, operations, services, spending, and the activities of their workforce. They can see that data through reports and dashboards. They can see trends and predict what will happen next.

But to influence what happens next, public sector organizations need data about the interactions that people have with them. Experience data captures beliefs, emotions, opinions, and perceptions – the "why" something is happening. And when organizations know why something is happening, they can make an informed decision about the best way to respond.

To win in this experience economy, intelligent enterprises connect experiences with operations. They use both experience and operational data to guide their decision-making. Intelligent enterprises collect insights from customers, employees, operations, and services at every touch point. They use powerful technologies to automate and integrate their data, processes, and applications, enabling them to sense risks, trends, and opportunities. And they act on this intelligence across every part of their organization (see Figure 5).

Only SAP has the strategy, expertise, and solutions to deliver on this vision, enabling intelligent enterprises to turn insight into action.

Figure 5: SAP® Intelligent Enterprise Framework

HOW TO PLAN YOUR PATH TO THE INTELLIGENT ENTERPRISE

In the digital economy, intelligent technologies and integrated business processes are now driving digital transformation.

To do this effectively requires an end-to-end plan for becoming an intelligent enterprise. This includes creating an intelligent enterprise road map and implementation plan with proven best practices and deployment options that optimize for continuous innovation with a focus on intelligent outcomes.

The End-to-End Journey to Becoming an Intelligent Enterprise

Plan
well to manage expectations

Simplify and innovate

- Reimagine business models, business processes, and work
- SAP Intelligent Enterprise Framework methodology as a guide for digital transformation
- Value-based innovation road maps

Build and launch
with proven best practices

Standardize and innovate

- Design thinking and rapid, tangible prototypes
- Coengineered industry innovations delivered with agility

Run
all deployment models

Run with one global support

- One global, consistent experience
- End-to-end support – on premise, in the cloud, or with a hybrid approach

Optimize
for continuous innovation

Optimize to realize value
Continuously captured and realized benefits of digital transformation

COMPREHENSIVE SAP ECOSYSTEM: ORCHESTRATING THE PARTNER ECOSYSTEM TO DELIVER VALUE FASTER

Our comprehensive ecosystem for the public sector offers:

- The Intelligent Enterprise as the overarching strategy to meet future requirements, providing:
  - SAP S/4HANA co-development programs for customers and partners
  - Industry co-innovation programs for industry-specific use cases
  - Delivery of enterprise-to-enterprise industry clouds
  - Thought leadership, evangelism, and enablement by industry through events, councils, and regular customer exchange
- Integration into a wide range of business services (OEMs, suppliers, key vendors, and more)
- Open architecture, with a choice of hardware and software specifically designed to meet requirements
- Complementary and innovative third-party solutions to provide leading-edge and state-of-the-art technology

Our partner ecosystem includes, among others:

accenture, Capgemini, celonis, Deloitte, DXC.technology, EOH, esri, EPI-USE LABS, EY, here, IBM, invenio, INFORMÁTICA, El Corte Inglés, lsi, itelligence, NTT DATA Business Solutions, L&T Infotech, Microsoft, NTT DATA Trusted Global Innovator, opentext™, PHOENIX BUSINESS CONSULTING, Signify

SAP IS COMMITTED TO INNOVATION

10-Year Innovation Vision

SAP delivers fully intelligent business solutions and networks that span across organization boundaries and promote purpose-driven businesses. These solutions will be the most empathic symbiosis between machine intelligence and human ingenuity.

- Self-running enterprise systems
- Self-organizing business ecosystems
- New markets and business models

Comprehensive Industry Coverage

SAP enables comprehensive coverage of the complete public sector value chain across the enterprise. With its clear industry road map, SAP is the partner of choice for the public sector industry.

- More than 13,000 public sector organizations in 97 countries innovating with SAP solutions
- Support for all lines of business on a single platform
- Helping government organizations improve the citizen experience, increase employee engagement, and boost public trust with an experience management platform

Proven Services Offering

By bringing together world-class innovators, industry and emerging technology expertise, proven use cases, and design thinking methods, we help public sector organizations develop innovations that deliver impact at scale.

- Proven methodologies to drive innovation, from reimagining customer experiences to enhancing operations
- Innovation that is fueled through a managed innovation ecosystem from SAP
- Ability to build your own innovation capability and culture

SAP supports public sector organizations in becoming intelligent enterprises – providing integrated business applications that use intelligent technologies and can be extended on SAP Cloud Platform to deliver breakthrough business value.

Learn more

- SAP.com for Public Sector
- SAP Services and Support

RESOURCES

Outlined below is external research that was used as supporting material for this paper.

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9. "IDC Forecasts Worldwide Technology Spending on the Internet of Things to Reach $1.2 Trillion in 2022," IDC, June 18, 2018.
10. "IDC FutureScape: Worldwide IT Industry 2018 Predictions," IDC, Doc. #US43171317, October 2017.

Note: All sources cited as "SAP" or "SAP Performance Benchmarking" are based on our research with customers through our benchmarking program and other direct interactions with customers.

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