COLLABORATIVE OUTCOMES IN THE PUBLIC SECTOR

PROCESSES AND ARCHITECTURE

SAP White Paper
Public Sector

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EXECUTIVE SUMMARY

WORKING TOGETHER TO ACHIEVE MUTUAL BENEFITS

Governments around the world are recognizing the value of collaborative outcomes, a term that describes when two or more entities share responsibility for managing toward an outcome that is beneficial to all. Collaborating and sharing information in the public sector can occur interagency and intra-agency, as well as across organizational boundaries with the private and nonprofit sectors. Such collaboration helps both entities maximize the value they deliver to their internal and external stakeholders. At the outset, this collaboration is often manual, generally involving communicating in the form of phone calls and e-mails. But eventually, if the collaboration succeeds, it needs to be supported by more formal processes and an appropriate technology architecture. Informal methods can work for a time, but they typically depend on experienced staff members with continuity in their roles, and when they eventually move on, collaboration suffers a setback. This paper looks at the way these collaborative outcomes are achieved, along with the patterns starting to emerge around the processes, and how these processes can be automated and codified independent of individual employees.

In the companion paper *Collaborative Outcomes in the Public Sector – An Innovative Way for Delivering Public Value*, we defined and cited examples of collaborative outcomes and how a flexible business process platform serves as the enabling foundation. Here, we explore the ways that these platforms can evolve.

COLLABORATIVE PROCESSES

HOW TECHNOLOGY ENABLES INFORMATION SHARING

To understand collaborative outcomes and how they can be supported by technology requires insight into where collaborative processes come from, how they are designed, how they are implemented, and how they work in practice.

How Ideas for Collaborative Processes Are Generated

In the public sector, a collaborative process begins when a skilled staff person working within a particular agency realizes that help might be available from another agency to achieve an objective, task, or policy mandate. For example, a caseworker in one government agency often knows key people in other agencies and can expedite processing of constituent requests and information. Collaborative outcomes typically start as good ideas or reflect the best practices of skilled workers.

But as the public sector workforce ages and people take their experience along with them to retirement or simply change positions, capturing best practices and implementing them into a process flow is key. While informal collaboration relies on personal networks, a codified process can allow knowledge to be leveraged and reused over time to ensure that working toward collaborative outcomes can continue on a larger scale.

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How the Processes for Collaboration Become Automated

The essential concept behind collaborative outcomes involves working with someone from another department or outside your agency by exchanging information or performing an activity together. Typically, this starts out through informal channels (such as phone calls, e-mails, or spreadsheets). By beginning in "manual" mode, skilled staff members have to invent processes from scratch. For example, one type of interagency collaboration entails sharing lists of people who are in violation of a certain law. In effect, one agency is asking another agency for information or requesting help in applying enforcement. As the requests are executed over time, people will develop a great deal of knowledge about the steps they use to achieve the desired outcomes. Eventually, that knowledge can be embedded in an automated system that allows more people to participate in the process.

Automation of collaborative outcomes usually follows a sequence that begins when the process is recognized as important and worthwhile, and participants decide to document that process. A technology architecture may or may not be involved at this stage, but the informal methods are replaced by a defined procedure. For example, instead of just exchanging e-mail, participants may use any one of the following mechanisms:

- A structured spreadsheet
- A standard query that produces a report
- A Web service

Whatever form the information takes, transferring it in a well-defined and possibly machine-readable way allows one system to talk to another, making clear what one agency is requesting of another. Building on that, the process may incorporate services or information from additional departments or agencies within the enterprise or from entities outside the organization. The next phase is for an IT environment to be created to keep track of a particular collaborative process, perhaps one that provides a unified view of the process in a portal or composite application.

How Architecture Supporting Collaborative Outcomes Can Emerge

As more collaborative processes become automated, this multiplies the number of mechanisms that one entity

can use to request information from another. Another way to see these mechanisms is as a vehicle to standardize the use of software to support collaborative processes and information sharing. At some point, IT departments usually provide a way to create these mechanisms for information transfer, with Web services becoming the most common because they are standardized and widely supported.

Creating a suite of Web services allows applications to be formulated based on these services. Such applications, called composite applications, can use Web services from any location and any technology and combine them to support even more advanced forms of collaboration. For example, part of the flow of a composite application could involve invoking Web services that check to see if a citizen applying for a driver's license owes income taxes. The composite application could go on to use other Web services to check any number of sources to determine if that citizen has other unfulfilled obligations subject to government enforcement.

Instead of solving each collaboration problem and each integration problem individually, a standardized architectural approach more easily supports collaborative outcomes and encourages reuse. Collaboration becomes easier to support, and additional collaborative outcomes can be fostered to meet the needs of additional constituencies.

Supporting Collaborative Outcomes on a Larger Scale

Governments with a vision to achieve collaborative outcomes typically face several technical challenges, including a heterogeneous system landscape, diverse data standards, and data privacy and protection issues. In most cases, governments have created systems to help a certain agency fulfill a particular mission. Some systems were built from scratch to perform a specific set of tasks, such as collecting taxes or analyzing statistics about road usage or maintenance. Rarely were they designed with an eye toward interoperability or to share information across agency boundaries. Part of the challenge of achieving collaborative outcomes lies in analyzing the existing system landscape to figure out how to minimize reworking.

Consider the number of different agencies, departments, and divisions that make up most governments, whether at the national, regional, or local level. Figure 1 illustrates the various service lines of business for most governments at all levels, many of which have systems that are not interoperable, even though some of their business processes are very similar.

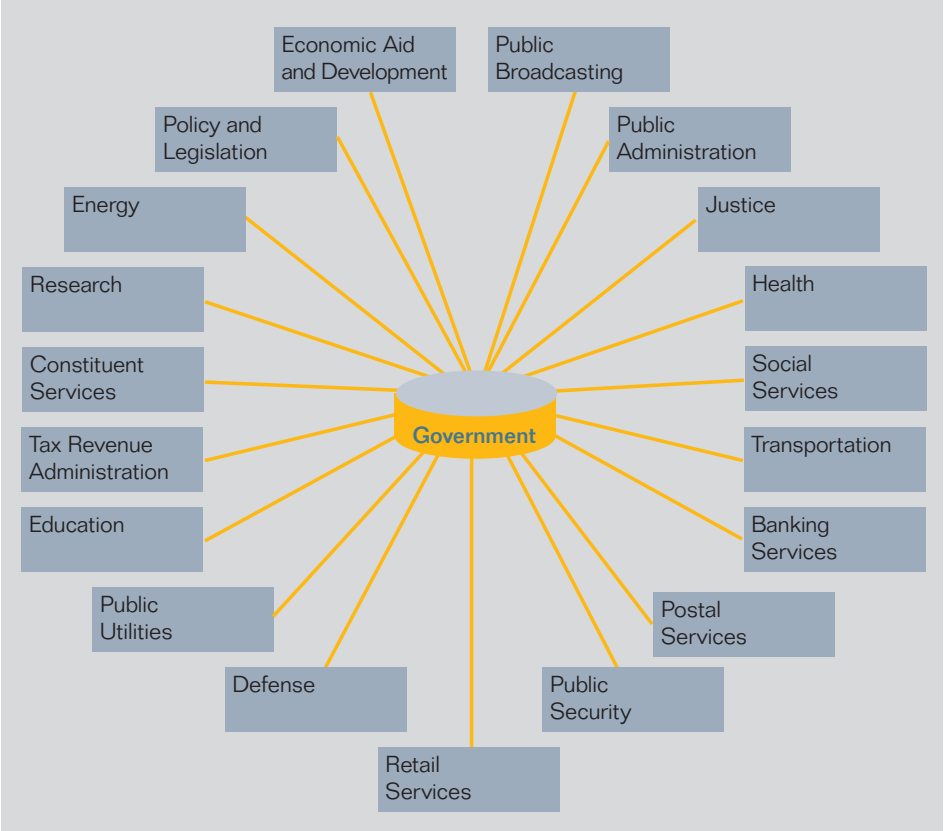

Figure 1: Typical Government Lines of Business

Although transactions from the tax and revenue management system in use by the tax administration must ultimately feed into the central general ledger system within the public administration office, those interactions are from the central hub to the spokes and back again. Considered as a whole, the existing landscape is made up of very different systems with organizational barriers and without, for example, established semantics about what information makes up a taxpayer record or constituent file.

A Multidisciplinary, Cross-Enterprise Approach

Collaborative outcomes are frequently supported by one-off integrations. But when IT people begin to see the value delivered from this singular approach, they often think about how to support collaborative outcomes systematically – which requires a multidisciplinary approach. To support collaborative outcomes on a broader level will require constructing an architecture that enables reuse. For example, if each agency has a view of a constituent or taxpayer with inconsistent information, this data could be consolidated to create a single view that can be shared by all agencies. With the right architecture, this data can be properly protected from the standpoint of data privacy and integrity. Such consolidation can simplify semantics and ensure that data updated in one place (an address change, for example) is propagated to all relevant systems. In the terms of enterprise computing, this challenge would be addressed through master-data management applications. One of the key challenges for automation of collaborative processes is to recognize which standard systems can be repurposed successfully to meet government requirements.

> Whatever form the information takes, transferring it in a well-defined and possibly machine-readable way allows one system to talk to another, making clear what one agency is requesting of another.

Discovering and Reusing Services

Indeed, reuse is key. Once a collaborative process creates a mechanism (usually a Web service) for reading information from a taxpayer's record, this mechanism can be reused repeatedly. Reuse is one of the primary goals of an enterprise service-oriented architecture (enterprise SOA) – the idea of building solutions on a foundation of Web services – and makes future integrations easier.

Reuse in part depends on letting others know what services are available. An agency moves from being an island to being part of a larger architecture and can make its services available to its peers to support inter-, intra-, and cross-agency processes.

An ideal approach to creating scalable support for collaborative outcomes employs the following types of flexible technologies and services:

- A business process platform that includes process-modeling technology so that opportunities for collaborative outcomes can be effectively analyzed, modeled, and implemented
- Enterprise application software that supports both the core public administrative "back-office" areas of government, along with the various "front-office," constituent-facing services lines of business shown in Figure 1, such as tax and revenue management, social services, and public security
- A partner ecosystem that allows different solutions to be integrated
- A service-oriented architecture to provide reuse and an incremental approach to development, providing faster results with less effort
- A means of cataloguing and discovering all available services through a repository
- Enterprise content management
- Enterprise search

This modular, reusable approach to developing software is fundamental for supporting collaboration on a large scale. Legacy systems must be integrated rather than replaced. A carefully thought-out business process approach allows governments to move toward an integrated and incrementally developed architecture. Further, the work involved in achieving one collaborative outcome can be leveraged to accomplish still others.

Example of a Collaborative Outcome

Figure 2 shows an example of a collaborative outcome among multiple agencies within a government – in this case, a provincial government and its licensing, tax, and public security agencies. This example achieves the following collaborative outcomes:

- The licensing agency issues and renews licenses only for eligible constituents
- The tax agency ensures taxpayer compliance
- The public security agency collects payments for outstanding tickets or citations

From a system perspective, the different agencies, each with a different system landscape, achieve these results by communicating with each other through automated means, usually involving standardized data files. In this example, we will assume Web services are used.

When a citizen applies to renew a license, the licensing agency sends a Web service call to the tax agency as part of the process flow to see if the citizen has unpaid taxes. The licensing agency also sends a Web service call to the public security agency to find out about any outstanding parking tickets or traffic citations. The tax agency and public security agency reply using Web services, and, if a citizen has debts or outstanding actions with either agency, the licensing process stops until the citizen clears up the other obligations. It is possible for this interaction to be completely automated by means of a secure Web site or kiosk, by an integrated composite application at the licensing agency, or by existing software through standards-based Web services interfaces.

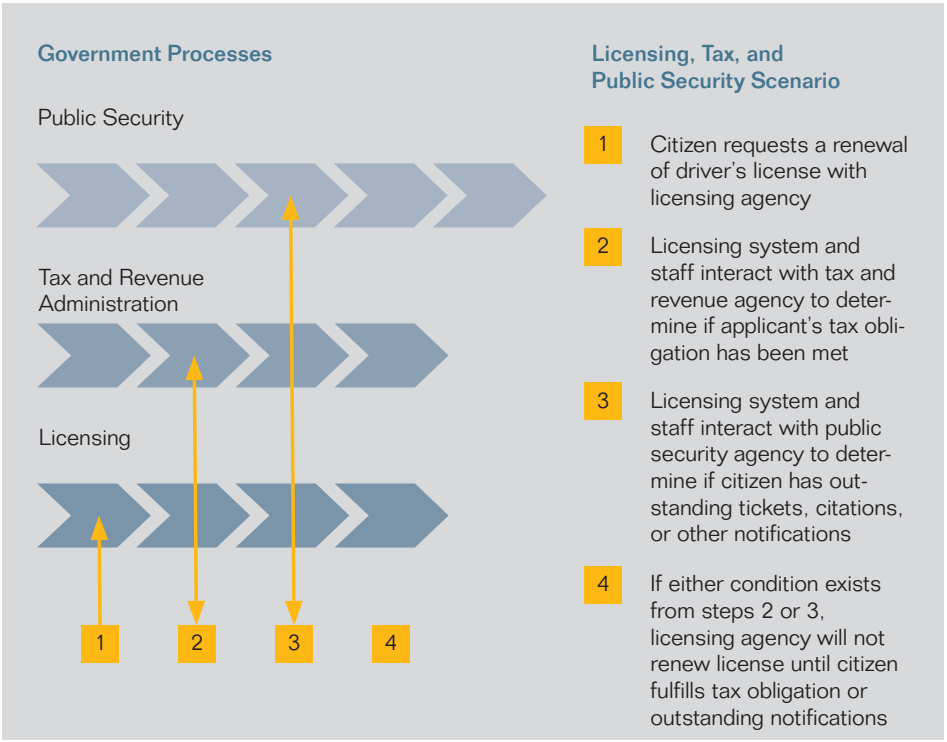

Figure 2: Example of a Collaborative Outcome in Government

How the Scope of Collaborative Outcomes Is Expanding

Increasingly, collaborative outcomes are becoming wider in scope and are expanding in the following dimensions:

- Within a government entity – Multiple agencies working peer-to-peer
- Up the government hierarchy – From a state or provincial government to the central government, for example
- Down the government hierarchy – From a state government to local governments, such as counties and cities
- Across the government hierarchy – From state to state, city to city, county to county, province to province
- Outside the government organization – From government to nonprofit organizations or the commercial sector

It is likely that as the scope of collaboration expands, standards for exchanging information across these dimensions and boundaries will expand as well.

COLLABORATIVE PROCESSES IN ACTION

HOW GOVERNMENTS ARE HARNESSING TECHNOLOGY

The best way to describe in detail how collaborative outcomes can be achieved from a technical point of view is to move from the abstract to the concrete. Let's explore four examples of what government entities can do to achieve a collaborative outcome.

> Part of the challenge of achieving collaborative outcomes lies in analyzing the existing system landscape to figure out how to minimize reworking.

Collaborating with Multiple Parties for Enforcement

In this example, a U.S. state government department of revenue comprises two agencies: general tax administration and child support enforcement. This state, like all others in the United States, is empowered by its own laws and that of the federal government to use a variety of means to ensure that noncustodial parents pay their child support. States are compelled to ensure that these payments are made, since many custodial parents rely on them as their sole source of income; delinquent payments often result in the need for public assistance. Federally sanctioned collection methods include:

- Suspending state-issued driver's licenses
- Intercepting federal tax refunds
- Taking state lottery winnings, unemployment compensation, and worker's compensation
- Requiring employers to deduct child support from noncustodial parents' wages (income deduction)
- Working with the court in the issuance of writs, also known as arrest warrants, which are put into the state's crime computer so police can use them statewide
- Placing liens on homes, land, and personal property such as cars and boats
- Reporting the child support debt to credit bureaus, which can affect the noncustodial parent's credit rating
- Placing a hold on bank accounts or taking money from bank accounts

Each of these processes is used to achieve a collaborative outcome. The automation of these mechanisms takes place through a program called enforcement tool selection. This tool analyzes the particular case in question and then decides which enforcement tool the state should use to attempt to collect the child support. The following sections provide representative samples of how the state government uses these processes to achieve specific collaborative outcomes.

Peer Agency: Revoking Drivers' Licenses

In this situation, the state sends a file of information to the state department of highway safety and motor vehicles, indicating which drivers should have their licenses suspended for nonpayment of child support.

Federal Government: Intercepting Tax Refunds

One of the primary ways that the state is able to collect child support is through its ability to intercept Internal Revenue Service (IRS) tax refunds. A file of collections is sent to the IRS, containing the social security information of the noncustodial parent. The IRS runs a batch program against that file to see whether the parent is receiving, or is likely to receive, a refund. If so, the refund will be intercepted and sent to the state for distribution to the custodial parent through direct deposit.

County Government: Placing Liens on Property

Liens on property, like property taxes, are the province of the county, which has the jurisdiction to place a lien on the property until the individual fulfills his legal obligation. The county outsources filing liens on property to various commercial sector service providers that file the liens on their behalf – another party in the collaborative process.

Employers: Informing the State Government of New Hires

When companies hire new employees, by law they must inform the state accordingly. Using this input, the state checks to ensure that none of these employees owes child support. If so, the state agency contacts the business to garnish the employee's wages.

Encouraging Economic Development While Ensuring Tax Compliance

This example comes from the Gauteng Shared Service Centre (GSSC) in Johannesburg, South Africa. The center provides shared services for the entire Gauteng provincial government across financials, procurement, and call center processes, delivering these services across all 13 government agencies and serving over 120,000 government employees.

As part of its mission, the GSSC works with emerging local businesses that are targeted for development. But this is a labor-intensive process, requiring the new business to register as a vendor and file documentation, including a tax clearance certificate, to prove that it's a viable entity with its taxes paid up. Specifically, the center must verify:

- That the vendor has paid its business tax obligations for the current year
- That the vendor has registered to do business with the government through the center

The staff must confirm all this information by contacting the South African Revenue Service (SARS) and checking all the details. Staffers must then enter the vendor in its database and verify it every 12 months – and with 16,000 vendors, that's a considerable task.

A vendor responding to an RFP or tender for a government project includes its tax number, which the GSSC verifies with SARS. Should tax obligations not be up-to-date, the center will disqualify the vendor for further evaluation on the bid until the tax payment is made. In other instances, when a vendor does business with the government outside a formal bidding cycle, the same tax verification is conducted; if taxes are delinquent, payment is withheld. Clearly, the two agencies are excellent candidates for collaborative outcomes.

The GSSC stands to gain:

- **Greater efficiency** – The agency could greatly compress the time it takes to check tax status information, a painstaking process that now takes between 14 and 21 days per vendor. A Web service could be used to verify information electronically at points in the process where it makes sense. The GSSC has already implemented such a system with vendor banks, enabling automatic verification of accounts and direct deposit into those accounts.
- **Improved constituent satisfaction** – Vendor information could be processed more quickly and fewer payments held up pending verification. The administrative burden on vendors is decreased, which serves to encourage emerging businesses rather than overwhelm them.

SARS stands to gain:

- An increased tax base
- Increased and automated collection, as the GSSC collects taxes before paying vendors
- Greater tax compliance, as the center essentially flags delinquent businesses that are bidding to become government vendors

By changing their business process flows to achieve these collaborative outcomes, both entities benefit. Since both agencies run the same enterprise resource planning application, the integration should be straightforward from a technical point of view, as enterprise SOA and guided procedures can be deployed to insert the necessary checks and automate the results.

Blocking Passport Issuance: Intergovernment Collaborative Outcomes

A third example of collaborative outcomes between levels of government is an existing U.S. federal government regulation that blocks the issuance of a passport from the Department of State if a noncustodial parent owes more than US$2,500 in child support. In this case, a federal agency is using information provided by the child support enforcement agency in the parent's state of residence. The collaborative outcome achieved is that the Department of State issues passports only to

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eligible citizens, while the state collects court-ordered child support payments. According to recent media reports, enforcement of this regulation has resulted in substantially increased collections of child support payments, estimated at $50 million per year.

Collaborative Outcomes in Coordinated Emergency Response

Analyzing the response to Hurricane Katrina in the United States in 2005 provides a final example of how to develop collaborative processes to handle such emergencies more effectively. Areas ripe for collaborative outcomes include:

- Logistics to handle the movement of personnel and material during emergencies
- Communication to ensure proper planning and response before, during, and after the event
- Sharing of information among different public and private entities and throughout the emergency response community about available services, needs, and volunteers and skilled workers

A simple example relates to providing emergency power and supporting first responders. Tasks that must be accomplished include:

- Assessing the most critical regions or entities that need power restored
- Sourcing and transporting generators
- Coordinating with health and safety agencies to ensure safe entry for first responders
- Coordinating with private industries to provide water, supplies, and building materials to predesignated locations
- Alerting and dispatching qualified drivers, delivery personnel, and people with expertise in safely setting up generators
- Providing status updates and situation reports among emergency operations centers, medical facilities, police stations, fire stations, and military or national guard for improved decision making for optimum disaster management responses

The collaborative outcome in this scenario is effective emergency response while ensuring the safety of first responders in a hazardous environment. This outcome was achieved by the coordinated information sharing and actions among the various service providers, spanning private and public organizations, working together to plan, deliver, and manage emergency supplies. This scenario was fulfilled by connecting the point of need to the point of the emergency response, and it was accomplished via a flexible technology that allows these entities to provide information in real time.

PROCESS PATTERNS IN COLLABORATIVE OUTCOMES

HOW THE TECHNOLOGY INFRASTRUCTURE MIGHT EVOLVE

To begin deploying a technology infrastructure that supports effective collaborative outcomes requires a look at some of the patterns that might be followed.

Point-to-Point or Batch Request

In terms of enforcement, sending a list of noncustodial parents who have not paid their child support to the IRS is an example of a point-to-point request, where one government entity requests information from another. This process may be as formal as nightly delivery of a file or an instantaneous Web service check, or as informal as making a phone call. The more such processes are automated, the easier it is for both parties to achieve their goals.

Shared-Service Centers

A shared-service center is an entity that consolidates and delivers uniform services to different groups within an organization, typically following a governance model. These services are usually administrative in nature, and the shared-service center helps the enterprise achieve economies of scale. One example may be a center that takes care of the payroll needs of several agencies within a government. By adopting a shared-service approach, a government can optimize resources in traditional "back-office" public administrative areas, increase efficiency, and lower costs. These resources can be reallocated to constituent-facing, "front-office" areas, helping governments improve service quality and deliver social and political value.

A shared-service center typically uses systems that are designed to work only within the center's needed framework. As shared-service centers begin to achieve collaborative outcomes, they will become engaged in an evolutionary process that moves them toward the model of a service-oriented government.

Many governments have designed systems that work well within contained environments but are now moving toward sharing services between entities to increase efficiency, offer better value to their constituents, and increase the likelihood of better knowledge capture.

Reusable-Services Model

When a government adopts a reusable-services model, each agency offers services to one another, speeding the creation of and support for collaborative outcomes. Such services can be supported by Web services or can simply be an offer for one government to perform a task for another. Many governments have designed systems that work well within contained environments but are now moving toward sharing services between entities to increase efficiency, offer better value to their constituents, and increase the likelihood of better knowledge capture.

For services to be reused effectively, it is vital to provide a clearinghouse that publicizes their availability, with lists of services in a standard format. Reusable services are not useful unless someone knows about them. Making it easy to discover available services offered to constituents by the government or through government agencies is a key to achieving collaborative outcomes.

ARCHITECTURAL EVOLUTION INSPIRED BY COLLABORATIVE OUTCOMES

DESIRE FOR PARTICIPATION LEADS TO SYSTEMATIC SUPPORT

The technical implementation supporting collaborative outcomes usually involves a bidirectional transfer of information. Sometimes this communication takes place through exchanging electronic files, sometimes through XML messages, and other times through Web services, which form the basis of a service-oriented architecture. Business process modeling can be used to construct new processes using the core services provided by various government entities. As collaborative outcomes grow in importance, they will require a platform for supporting integration and creation of Web services and composite applications. And as one agency's systems increasingly enable collaboration, other agencies will want to work together more consistently. That will lead to the development of rules and a software architecture for connecting systems to achieve collaborative outcomes.

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CONCLUSION

CREATING AND LEVERAGING A BUSINESS PROCESS PLATFORM

Collaborative outcomes are becoming an important trend in increasing government efficiency and effectiveness and helping governments worldwide maximize their public value. Increasingly, governments are fulfilling their missions through collaboration within and across organizational boundaries. By working together, government agencies can boost service quality and better leverage taxpayer dollars while delivering improved social and political value. As more collaborative outcomes are realized, the need to support them on an architectural level will take on added urgency.

In the scenarios cited above, the organizations involved can leverage a business process platform to help them manage their respective missions and achieve successful collaborative outcomes. SAP® software supports a business process platform for the public sector, enabling standardization, innovation, and collaboration on one common, open platform. Public sector organizations can leverage natively integrated SAP solutions supporting public sector industry processes. These solutions support public administration processes across accounting, workforce management, and procurement to constituent-facing service lines of business, such as tax and revenue management, public security, social services, and constituent services, to name a few. The SAP NetWeaver® technology platform serves as the foundation of this business process platform, which can easily change and orchestrate new processes driven by citizen demands, legislative actions, or regulatory reform. For governments that have invested in proprietary, legacy, or best-in-class third-party applications – and want to protect those investments – SAP NetWeaver can integrate these solutions into the business process platform and still support collaborative outcomes.

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