

In Support of the Mission: PPQ Integrated Data Services Strategic Plan 2011 to 2015



The Roadmap to this Strategic Plan

This “PPQ Integrated Data Services Strategic Plan” contains the following elements:

1. **Forces for Strategic Change:** This section examines how the budget reality and new policies and approaches to Federal information technology (IT) management are serving as motivators to inform Plant Protection and Quarantine’s (PPQ’s) strategy—with PPQ’s strategy building on a foundation of recent accomplishments in information systems implementation.
2. **PPQ Integrated Data Services (PIDS) Strategy:** The goals, objectives and actionable strategies including a mission statement, a description of vision that states where PPQ information management will be in five years.
3. **Benefits and Implications of this Strategic Direction:** This section examines the strengths and weaknesses of PPQ, and the opportunities and threats PPQ faces. This section also examines some of the implications for the strategy, relating both required and implied changes in PPQ organizational culture, IT policy development, and structure, as well as the benefits of the strategy.
4. **Terminology and Definitions:** Definitions are provided and explanations are given for use of terminology. Relationships are provided for plain-language terms to more technical terms used in some contexts for their precision.
5. **References:** Electronic links (URLs) are provided to full texts of the documents referenced in this plan.

1. Forces for Strategic Change

The New Political and Budget Reality

In the current budget climate, it is imperative for PPQ to use the most efficient means to build the most effective IT systems possible. Efficient IT system development reduces budget outlay for IT systems costs. Effective IT systems reduce PPQ operating cost by increasing the efficiency of employees in carrying out the PPQ mission, and in creating systems that are agile and adaptable in cost effectively addressing new pest and disease situations.

Recent Policy Guidance

Two specific policy announcements must be acknowledged as game changing for IT management in USDA. In December 2010, White House CIO Vivek Kundra, rolled out the **25 Point Implementation Plan to Reform Federal Information Technology Management** which provides a new framework for IT procurement and management. It directs that large IT projects be developed in discrete modules with delivery time-frame no longer than twelve months. The intention is to create projects with manageable scope and provide IT services to end users in a more timely way. The **25 Point Plan** sounds the themes of the government using the best practices of industry to build integrated data services that are efficient and effective.

The second policy announcement of note was published in two memoranda, one from OMB (Kundra, 2010) and one from the USDA Office of the CIO (Smith, 2010, Aug 6). They set out the expectation that major government data systems will be hosted either at a few authorized, consolidated government Enterprise Data Centers or on government contracted web services, (“the cloud”). In response to CIO Smith’s memo, PPQ developed a migration plan for moving mission-critical systems to the USDA Enterprise Data Center, NITC at Kansas City.

New Focus

PPQ issued an **Information Systems Management Strategic Plan** in 2008. In 2009, the plan was updated by a **PPQ Information Systems Roadmap**. In implementing those plans, PPQ has built a record of accomplishment in IT. Because of the pace of change in the information technology arena and the significance of the new policy guidance that has been issued by the White House, the Office of Management and Budget, and the USDA Office of the CIO, we believe it is time to establish a new base line, and develop this new Strategic Plan building on those accomplishments.

Responding to the realities of our budgetary environment, the new plan will be driven by an intensified focus on achieving effective IT solutions for PPQ mission delivery, through the most efficient IT development and procurement practices available, modeled on the best practices of industry.

2. PPQ Integrated Data Services (PIDS) Strategic Plan

Mission

To provide quality customer-driven data and IT service to optimize PPQ's effectiveness and efficiency to carry out its mission.

Vision

PPQ has achieved its vision when PPQ's Integrated Data Services are:

Effective and Efficient

- All of PPQ's business functions (agricultural quarantine inspection(AQI), domestic programs, trade, emergency programs, smuggling interdiction, etc.) are fully supported with the data they need for analyses and decisionmaking
- New knowledge and information generated by PPQ (analyses, risk assessments, pathway studies, host ranges, and other studies) are managed efficiently with effective content management practices, to serve as a platform for learning.
- All PPQ employees are able to use the provided IT tools to the fullest extent possible for maximum efficiency and effectiveness in carrying out the PPQ mission.

Integrated and Coordinated

- PPQ has integrated across all program activities, the knowledge and data necessary for making strategic and operational decisions at all levels.
- PPQ effectively coordinates/shares data across repositories and platforms, with effective content management tools not only in traditional IT services, but also in our shared information environment (SharePoint) and in GIS applications
- Data and data applications are modular, scalable, integrated, secure, stable, and reusable
- Data elements are entered once, with a single commonly accepted definition, maintained with quality control measures, and are available for all end-users who need them when they need them (one version of the truth)

Agile and Responsive

- PPQ IT is agile and adaptable to respond to new pest and disease threats quickly, with cost-effective IT solutions
- PPQ has acquired and developed capacity to reduced dependence on IT contractors for operation process management of its data, and for governance, change management, and coordination of knowledge repositories

Goals

To meet the challenges of the strategic forces of change and to fulfill the vision of the future, the following strategic goals were identified:

Goal 1: Enhance PPQ's business processes and increase PPQ's access to quality data in a useful format when and where it is needed based on an Enterprise Architecture Planning approach

Objectives:

1.1. Create and maintain a business model of PPQ as the basis for Enterprise Architecture planning

Actionable Strategies

1. Document organizational structure and the interactions among business functions
2. Identify and define business functions and map them against the organizational structure
3. Model and come to consensus on organization-wide business processes
4. Identify the organizational issues requiring Leadership Team decisions regarding opportunities for streamlining and business process improvements

1.2. Define current state systems & technology architecture

Actionable Strategies

1. Document all information using tools/software that allows for capturing complex information, showing linkages and allows for updates in multiple locations simultaneously.

1.3. Create a Data Architecture plan based on the functional business model that is integrated across organizational units.

Actionable Strategies:

1. Identify and document data entities and attributes that will serve as the backbone of all new IT solutions and are integrated across all program activities and functions in PPQ.

2. Plan for a data model with commonly accepted definitions across all program functions/activities, maintained with standardized quality control measures to ensure the highest quality data, including meta-data
3. Identify the data sets needed to support PPQ's decision framework and to inform and support the decisions that PPQ managers make both strategic and operational.
4. Support the creation of analytic models across programs such as AQI, domestic programs, and emergency programs to support pathway and trend analysis through integration of data sources

1.4. Create an Application Architecture plan that provides for modular, agile, scalable and re-usable application solutions.

Actionable Strategies:

1. Adopt a modular approach to IT solution development that provides for maximum agility in meeting unique and changing business or program data and information requirements, and is scalable to the size and scope of the project and will be reusable when program requirements change.
2. Define strategies to ensure customers can enter, edit, sort, change, analyze, summarize and archive and reference data.
3. Post real-time performance metrics (both of PPQ IT systems and PPQ programs) on easy to read and understand formats (such as dashboards) available for anyone who needs it.
4. Plan for applications where data are entered once to support the data needs of multiple programs, multiple times.

1.5. Create Technical Architecture plan that provides the infrastructure to fully support the operations of the Enterprise Architecture

Actionable Strategies:

1. Plan for PPQ IT solutions to be built on on virtualized servers (the newest generation available) to be "cloud ready" should more efficient government-approved, alternate hosting solutions become available.
2. Describe how to manage technology as one component of the overall Enterprise Architecture.

3. Implement real-time performance and security monitoring tools to assure optimum performance of the PPQ shared data environment

1.6. Develop and implement a strategy to move to the planned IT environment based on business and mission priorities.

Actionable Strategies:

1. Prioritize projects to move from the current state to the future architecture.
2. Develop an implementation plan to identify the activities, sequencing, resources, and schedule requirements to achieve the goals established in the Enterprise Architecture Plan.
3. Continue to develop and implement current IT investments (e.g., ARM, IPHIS, PCIT, SNICAS, etc) while incorporating, where practicable, principles and approaches being developed by the Enterprise Architecture planning, so these investments can be easily integrated into the new Enterprise Architecture.
4. Develop and implement strategies to transition from current legacy systems to a shared data environment, with the plan including support for legacy systems until service modules replace current functionality, and ensuring consistency of the PPQ user interface or portal so that service to frontline users is not negatively impacted

Goal 2: Create a quality customer-driven data and IT service organization

Objectives:

2.1: Ensure the Business Information Systems Strategy and Management (BISSM) Staff is equipped to support the customer-driven and quality data and IT service organization

Actionable Strategies:

1. Develop a staffing plan that addresses competencies and capabilities to address governance, day to day operation, process and change management, and coordination relative to ITD, as efficiently as possible;
2. Identify new competencies and functions necessary to support the data services environment;

3. Achieve and maintain certification levels that demonstrate “best in class” competence; and maintain the highest level of customer support for effective use of data services to carry out PPQ’s mission.
4. Clarify BISSM staff’s role and responsibilities and redefine where appropriate.
5. Build capacity in the Customer Service support function to identify and support delivery of training to end users on all aspects of new IT tools commonly used by most PPQ employees, including, Outlook, SharePoint, etc. so these tools can be used to their fullest capacity.

2.2: Establish and actively engage an IT governance structure to ensure active customer involvement in the entire life cycle of systems development and operations of data and IT solutions

Actionable Strategies:

1. Provide an IT governance process and structure for data architecture, data standards, and change management that takes into account data sharing needs within and with other organizations and ensures alignment and support for PPQ’s mission delivery.
2. Establish a policy and protocols to ensure data quality is maintained at the appropriate levels of the organization.
3. Develop and implement change management strategies, including end-user training, help desks, mechanisms for feedback from end-users to support the implementation of all new organization-wide IT solutions and to ensure quality of the solution developed.

2.3: Develop and implement a quality management program

Actionable Strategies:

1. Engage customers in developing and implementing a comprehensive quality management system to ensure quality is planned for, designed into and maintained in all IT products and services
2. Implement real-time performance and security monitoring tools to assure optimum performance of the PPQ shared data environment.
3. Develop automated tools to monitor PPQ program performance metrics

Goal 3: Decrease costs of IT investments and Service Delivery to sustainable levels***Actionable Strategies:***

1. Collaborate with other APHIS programs, such as VS, MRPBS, AC and WS, to adapt and leverage existing IT solutions to meet similar program needs in PPQ.
2. Reduce the number of IT investments requiring certification and accreditation by reducing the number of redundant systems requiring C&A.
3. Migrate all remaining IT systems to NITC, USDA's central data center....
4. Publish policies and create structures for effective governance for a shared data services environment, including content and records management
5. Continually, perform "build or buy" analysis to determine whether the competencies and capabilities are provided most efficiently and effectively by: hiring, re-training, as soon as the budget allows or contracting for service
6. Reduce dependence on contractors where appropriate
7. Develop technology standards across all systems to promote a single technical infrastructure for all PPQ systems in use.

3. Implications and Benefits of this Strategic Direction

This section examines some of the implications for the strategy that are set out in this plan, relating both to changes in organizational culture, IT policy development, and structure.

Strengths, Weaknesses, Threats, and Opportunities for PPQ Data Management

PPQ's has a history of recent accomplishments as a foundation for building its data management strategy. PPQ has elevated the organizational level of IT management and business systems management by realigning those functions to report directly to the Assistant Deputy Administrator for Business Information Systems Strategy and Management in the Office of the Deputy Administrator.

PPQ has implemented a number of IT governance changes based on the 2008 strategic plan to bring about greater accountability. All major systems have steering committees made up of executives and senior managers, professional project managers, and clearly identified business owners. Most have business systems managers. These changes have put mission delivery and functionality of systems to users and programs in the forefront.

PPQ has recently rolled out major systems based on the principles set out in the strategic plan.

- The Phytosanitary Certificate Issuance and Tracking (PCIT) system has become the international "gold standard" for phytosanitary certificate issuance. It is collecting State government as well as Federal fees and reimbursing State governments, saving States hundreds of thousands of dollars in administrative costs annually.
- PPQ is working closely with other APHIS programs as new technology is being planned to support e-Permits to maintain the high level of customer satisfaction through the technology changes.
- The Integrated Plant Health Information System (IPHIS) has been pilot tested in 2010 and rolled out in 2011 and is being implemented for domestic and emergency programs. It is being widely adopted as a system by a number of State Cooperators as well as supporting a wide range of PPQ domestic and emergency programs.
- PPQ not only has reengineered Agriculture Quarantine Inspection (AQI) business process in advance of automating them in the Agriculture Risk Management (ARM), but has done so with the input of a large number of its front line employees (including Plant Inspection Station personnel), and also a significant number of Custom and Border Protection Agriculture Specialists with port experience.
- PPQ is developing the assessments and documentation to fully support the SITC National Information Communication and Activities System (SNICAS) as an integral

component of its official information portfolio, and is beginning the planning process to migrate SNICAS to NITC.

- PPQ has begun discussions with CPHST management to migrate mission-critical databases to NITC, and is collaborating on concepts and vehicles to support methods development and discovery much more comprehensively from servers at NITC.

Implications of Implementation of PPQ Integrated Data Services

On the road to a more effective and efficient shared data services environment, there are some upfront costs in building the infrastructure and re-training and/or hiring staff with additional skills to govern and maintain a data environment with this level of integration.

Some current PPQ organizational structures are likely to become redundant or counterproductive. For instance, the maintenance of systems developers and systems operators reporting to the regional offices or CPHST would no longer fit the critical requirement of centralized or at least closely coordinated governance necessary for an enterprise-wide (PPQ-wide) data environment. The regional IT staffs in the regional offices that have included a significant number of staff that were not engaged in direct customer service, such as those personnel that supported ISIS, e-Traps, SNICAS, ALBES, and other systems and applications whose functionality will reside in PIDS. PPQ will need to determine how best to refocus the work of those employees. If those staff members and positions were realigned they could augment the staffing of the maintenance and governance of the PIDS. Realignment of those personnel into a unified IT staff could hasten the ability of PPQ to achieve its goal of reducing reliance on IT contractors for systems development.

The administration in PPQ of data servers, software applications, SharePoint and data management must be governed as part of the overall IT governance process, or pockets of data will reside outside the PPQ-wide environment. If not brought under governance, such isolated data will become divergent from the PPQ's managed data and lead to inefficiency and potential conflicts.

Geographic information system (GIS) functions and specialists need close coordination with PIDS to ensure that the most recent program data are available to inform GIS program maps and that the best GIS tools are implemented in PPQ IT solutions for mapping data for interpretation and decisionmaking. IT specialists, program data managers, and GIS specialists need a robust forum for coordination and exchange of data and services to provide agile solutions to PPQ and to maintain data integrity. It is important that PPQ not maintain redundant functionality in the GIS environment and the IT or data management environment; instead, they should be seamless and interactive. To accomplish this PPQ will need to establish coordination structures and appropriate policies to enable effective exchange of information between the GIS and IT communities.

The systems that CPHST has administered have been maintained under cooperative agreement with university partners. That has provided CPHST a certain amount of flexibility in establishing new functionality. Until recently, systems that were operated by cooperators were often not required to meet the same levels of scrutiny and documentation as was required of contractor developed systems, but that is no longer the case. As mission-critical data are migrated to Enterprise Data Centers such as NITC, and further migration of other CPHST data systems is mandated, there is a need to maintain the functional flexibility CPHST requires, while meeting the new mandates. When PPQ has fully addressed this impact by developing environments at NITC for data and information support for CPHST cooperative methods development, there is the very positive impact to PPQ of facilitating the adoption much more readily of CPHST innovations into the main PPQ computing environment.

Benefits of Implementation of PPQ Integrated Data Services

The benefits of developing shared-data services (or a PPQ-wide service-oriented architecture (SOA)) can be extrapolated from wide experience in U.S. industry, where well over half of medium to large companies have implemented SOA for part or all of their data management.

The benefits that others have demonstrated in implementing enterprise-wide data services solution such as PIDS are much more efficient and accurate automated processes. Some of those efficiencies have been shown to be:

- Timely access to data and information
- No duplicate data entry
- Increased agility: Timely response to new functionality or necessary fixes
- Availability: Systems availability is transparent and policies clearly articulate when they should be used
- Reduced cost to maintain
- Reduced system redundancy
- Reusability: Adaptation or reuse of data, templates, modules, and systems components

PPQ believes that we can also reduce our dependence on contractors by training some additional staff to maintain a style of architecture that promotes reuse at the macro level and establishes data services in one conceptual model. The simplification for interconnection to and usage of existing IT assets should allow for a seamless evolution from the current systems environment to the fully actualized service-oriented environment.

Perhaps the greatest benefit to be derived from a fully integrated, service-oriented data environment such as PIDS is that the ability to be agile in creating new IT functionality should result in greater agility in PPQ responding to new mission challenges. The ability to reuse and repurpose data and services quickly will allow PPQ to be “light on its feet” to respond rapidly to address new pest or disease outbreaks.

5. Terminology and Definitions

In this section we define or describe the meaning of terms used in this strategic plan. Analogies (and the limits of the similarities) between plain language terms and technical terms are discussed.

Content management -- The set of processes and technologies that support the collection, managing, and publishing of information in any form or medium, including digital content. Digital content may take the form of text, such as documents, multimedia files, such as audio or video files, or any other file type which follows a content lifecycle which requires management. Content management includes the process called records management. (from Wikipedia, http://en.wikipedia.org/wiki/Content_management .)

Enterprise Architecture- is a rigorous description of the structure of an enterprise, which comprises enterprise components (business entities), the externally visible properties of those components, and the relationships (e.g. the behavior) between them. EA describes the terminology, the composition of enterprise components, and their relationships with the external environment, and the guiding principles for the requirement (analysis), design, and evolution of an enterprise.^{[1][2]} This description is comprehensive, including enterprise goals, business process, roles, organizational structures, organizational behaviors, business information, software applications and computer systems.

(from Wikipedia, http://en.wikipedia.org/wiki/Enterprise_architecture)

Integrated data services – establishes a (commonly or communally or jointly) shared data platform with a common set of data standards that support a wide variety of data and information needs of multiple organizational programs and activities. This approach is a departure from the current “stove-pipe” stand-alone systems set-up.

PPQ Integrated Data Services (PIDS) – The name PPQ has given to the new computing environment that will result from implementation of this strategic plan. It will be comprised of: Enterprise Architecture data standards and integration across the organization; application development that is modular, scalable, flexible and reusable and technical solutions that are secure and “cloud ready. “

Service-oriented architecture (SOA) – A technical term that summarizes a set of design principles for systems integration in computing that packages functionality as a suite of interoperable services. It is generally seen as a way of moving beyond nonintegrated systems to an integrated continuum of information services across an enterprise such as PPQ. [Compare this definition with Wikipedia, http://en.wikipedia.org/wiki/Service-oriented_architecture .] See the discussion in section 3 of this plan for a more complete description of the components of SOA.

Shared-data services – A term PPQ is using in this plan as plain-language descriptor of the outcome of service-oriented architecture (SOA) as it relates to data. Shared-data services are contrasted with a traditional data systems approach where data is captured by individual systems and potentially replicated in other systems. In a SOA, data are ideally captured once for the entire enterprise and shared as a service to any data application that requires that data element--an ideal characterized as “one version of the truth.”

Shared-information environment – A plain-language term PPQ is using in this plan to describe the full range of information shared in both the shared-data services environment for those services hosted at NITC, and also those shared information services (such as SharePoint and Enterprise Messaging) hosted on USDA contracted “cloud services.”

6. Reference Documents

PPQ Documents

2011. Road Map to 2015: A Strategic Plan for Plant Protection & Quarantine.

http://www.aphis.usda.gov/plant_health/downloads/DRAFT-PPQStrategicPlanver%203.1.pdf

2009. Information Technology Roadmap.

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Guiding Policy Documents

Smith, Christopher L. 2010. USDA Enterprise Data Center Efforts. Memorandum to Agency Chief Information Officers. USDA OCIO. [need URL]

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