Enterprise forms technology drives a more agile organization

Significantly improve user engagement and organizational agility by transitioning forms and documents to the enterprise level

Businesses and government agencies strive to efficiently connect people to both internal and external processes in order to meet objectives, provide products, and render services ranging from the simplest to the most complex. For many organizations, forms and documents represent the core engine that drives these processes. And the ability of individuals to easily access and interact with an organization at the forms level is crucial to achieving effective communications and maximizing operational results.

While organizations often see the value of using the latest technology in forms processing, they are challenged to find a solution in line with today's highly decentralized, mobile, security-conscious world. Yet the very nature of our rapidly changing world and technology dictates that businesses and government agencies embrace the automation of forms and documents to keep pace with societal trends. Organizations must look to capitalize on the opportunities of digital technology to connect people and forms.

Organizational agility

Something that is agile has a quick, resourceful, and adaptable character and is marked by the ready ability to move with quick, easy grace.[*] In relation to agile organizations, quick thinking and actions are standard modes of operation—adaptability is imperative and resourcefulness is key. Strategies are determined with flexibility and growth in mind. Agility produces success and pervades the most successful organizations.

To best meet the great demands constantly placed on organizations from internal and external sources, agility is necessary. Economic uncertainties cause changes in the market, while regulatory changes require government departments to quickly respond. Agile organizations must adapt to changes and new technologies more quickly than ever to capture the right information in the correct format.

Technology trends

Three distinct trends are quickly changing the way we work with and think about forms and documents. The agile organization will keep pace with these movements by embracing them and moving forward.

- **Mobile**—Sales and use of all types of mobile devices are sharply increasing across every income bracket. Smartphone sales have overtaken PC sales and will soon dwarf them.[†] This represents a new mass touchpoint in forms technology as more people than ever will have Internet access via mobile devices.

- **Web as the hub of discovery**—The world population increasingly views the Internet as a central point for discovering the right processes to use. We turn to the web to find information, services, and products across all business applications and government agencies. The rate of movement to the web as a discovery tool is astounding. Between 1998, its official first year of business, and 2011, Google saw its average searches per

[*] Merriam-Webster Dictionary. 2012. Definition of Agile. *www.merriam-webster.com/dictionaray/agile.*
[†] Blodget, H. and A. Cocotas. 2012. The State of the Internet. Business Insider. *www.businessinsider.com/state-of-internet-slides-2012-10?op=1.*

day go from 9,800 to over 4.7 trillion.[†] This change can streamline how organizations help users discover and take advantage of self-service channels via the Internet.

- **Big data/analytics**—Internet usage is one factor that led to the information explosion deemed "big data." Some experts say the Internet grows by an exabyte of data daily—that is equal to 250 million DVDs.[§] This new wave of data is highly distributed and hard to analyze. Yet those organizations effectively capturing and harnessing big data will have an unprecedented visibility into how to best understand and serve their users.

Interestingly, the very trends prompting changes in organizational operations are also opening up new opportunities and channels for improving the way we connect people to processes through forms. This means that solutions to the challenges presented by these trends lie within the trends themselves.

Evolution of forms technology

Before the advent of the Internet, mobile devices, and big data, paper forms were the primary means for connecting people to processes. The cost for organizations to operate included all the time needed to generate, distribute, and process paper forms. In a much less automated world, the time-intensive manual processing required by paper forms was necessary.

Paper forms transition to downloadable forms

As the world became more connected through the Internet, more forms processes could be taken to people as opposed to making people come to the process by going to a business or government office to fill out a paper form. Basic office productivity applications like word processors and spreadsheet programs were used for creating electronic downloadable forms (DLF) in largely ad hoc processes. Participation, though, was limited to users who had the native applications with which the forms were created. And process integration with organizational systems was generally low or nonexistent.

DLFs provided benefits over the sole use of paper forms. User satisfaction was improved in terms of upfront time and even privacy—users could download and print a form, fill it out at their convenience, and then fax, mail, or take it to the organization. On the organizational side, DLFs provided little advantage over paper forms because of their ad hoc nature and the lack of process integration. Rekeying was still required, and the primary inefficiencies of manually handling forms remained.

Emergence of enterprise forms

Effectively digitizing forms and offering self-service channels became more critical as Internet usage continued to rise. Users wanted better access to forms processes from their desktops. The initial offerings of web forms and enterprise forms solutions provided more online forms capabilities, although they were locked to desktops and desktop browsers. A variety of languages were created and used as online forms emerged.

Hypertext Markup Language (HTML) was used for data-entry forms, especially in web browsers. HTML web forms were adept at creating electronic forms for online-only usage when the look-and-feel fidelity of a form was not important to the process or dictated by industry standards.

Portable Document Format (PDF) forms are a type of PDF file that contains form data, logic, and presentation information to render high-fidelity business forms, especially those requiring the same look and feel on screen as well as on paper. While most forms technologies provided a data layer and some level of business logic (either on a server or locally), PDF forms provided the additional strength of a very precise presentation layer. This has driven PDF to become a global standard for the accurate and consistent rendition of business forms.

Enterprise forms gain device independence

The latest enterprise forms software provides end users with more capabilities and device independence. At their best, enterprise forms optimize the user experience by detecting the device type and delivering the right interface experience to that device. With device use shifting from the desktop and rapidly expanding to tablets and smart mobile devices, today's enterprise forms solutions can very effectively connect more people and devices to organizations.

[†] Statistic Brain. 2012. Google Annual Search Statistics. *www.statisticbrain.com/google-searches*.

[§] Bort, J. 2012. 10 Fun Facts About How the Internet REALLY Works. Business Insider. *www.businessinsider.com/how-the-internet-really-works-2012-11*.

Today's forms processing alternatives

Now that you have a basic understanding of forms evolution, let's look at some different ways organizations address forms and document processing today. A few common approaches include ad hoc data collection, build-it-yourself solutions, and point solution combinations.

Ad hoc data collection

As organizations grow, data capture mechanisms tend to develop in a spontaneous rather than planned manner. Information is often collected through various paper forms, unstructured electronic documents, email, spreadsheets, and assorted user interfaces. These data capture mechanisms are initially expedient since they are quickly created by users throughout the organizations with a variety of familiar and accessible tools. Over time, organizations come to realize that these ad hoc mechanisms have hidden efficiency costs and problems.

- Capturing data from paper forms by rekeying is time-consuming, error prone, and likely to introduce delays in processing.

- Unstructured documents and spreadsheets provide electronic data, but they cannot be easily transferred to enterprise systems for processing. The electronic data has to be laboriously copied and pasted or otherwise transformed into a format accepted by these systems. Automating data transformation is difficult and fragile as changes are made to the documents or spreadsheets.

- Access to enterprise systems is seldom provided to external participants. Without access, these users must go through high-cost channels to obtain needed forms and documents.

- User interfaces are often defined by underlying data structures rather than with end-user needs in mind. This results in higher costs and poor adoption rates as users and organizations often revert to more familiar, more expensive mechanisms like paper forms.

- Users can have difficulty discovering the right person, form, or tool needed to initiate a process, ultimately leading to wasted search time or high-cost time with customer support.

Build-it-yourself solutions

To avoid the pitfalls of ad hoc data collection mechanisms, organizations often gravitate toward building their own applications to capture data and transfer it to enterprise systems. These organizations quickly find that the complexities of developing applications for a variety of web browsers, mobile devices, languages, locales, and currencies can bog down the projects. Document generation and archiving requirements add more complexity and rapidly expand the project scope. IT organizations find themselves spending considerable resources developing, maintaining, and upgrading these custom forms applications. The organization as a whole moves further away from its core competencies and finds itself managing software development projects instead.

Point solution combinations

Tackling forms and document processing problems by combining point solutions from best-of-breed vendors is often an attractive alternative for organizations that realize they can't live with the status quo or build out their own software solutions. Point solutions are tempting because they address discreet problems, allowing the most urgent pain points to be addressed quickly. One solution can target data capture, a second documentation and communications, another process management, and yet another document security.

Once these systems are in place, it becomes apparent that integrating them in a consistent and manageable way is a major undertaking, if not completely impossible. Since the different vendors of these point solutions did not develop them with other best-of-breed vendors in mind, the assets for the various solutions are difficult to share and reuse. The disparate solutions often compete or conflict in some aspects. While each individual solution may perform well, the solutions don't necessarily integrate as a whole to meet the needs of an entire organization.

Enterprise forms—the best solution

While each of the three forms processing alternatives attempt to improve an organization's agility, they lack the cohesion needed for maximum utility and performance over the long term. An enterprise forms solution provides the multichannel capture and organizational integration not available with ad hoc data collection. Extensive IT-level maintenance and enhancements are not required by an enterprise forms solution. And the

duplication and integration costs typically experienced in point solution combinations do not exist in a unified enterprise forms solution.

To address the need to connect people to forms processes, organizations should first look to fulfill a core set of functional capabilities, with each capability satisfying a set of requirements centered on agility. And, the enterprise forms solution is firmly anchored in architectural principles to help future proof the organization.

Core functional capabilities

The core functional capabilities to be fulfilled by an enterprise forms solution include the ability to capture and process information, effective mechanisms to communicate to users, and robust mechanisms to secure sensitive information for the process—regardless of where the forms and documents travel.

First, an enterprise forms solution must intuitively capture and process data and information from users. An often-overlooked step in the capture phase is ensuring discoverability of forms to customers. A common approach is the centralization of all forms in an online marketplace, directory, or portal to aid discoverability and initiation of the forms process. Once a form is located, the user should be able to fill it out in an intuitive manner regardless of the chosen channel. And the solution should personalize the content with data known about the user. Upon submission, the form information is integrated into back-end systems, and a document-based workflow is initiated to service the user's process or request.

Second, the solution needs to view these interactions as conversations and must communicate to users. Two-way communication is essential. After users submit requests, the enterprise forms solution responds with some type of correspondence. An organization might also send correspondence to users requiring a response in the form of a signature or completion of a form.

Third, an enterprise forms solution needs to secure sensitive information captured and communicated by the enterprise. This includes personally identifiable information (PII) as well as sensitive corporate information. By securing at the content layer rather than the system level, organizations can capture and communicate content in a manner that reduces the risk of malicious or intentional document leakage.

Enterprise forms solution requirements

Each of the three functional capabilities—capture, communicate, and secure—must satisfy several requirements for an effective enterprise forms installation. The central requirement is agility that encompasses scalability, mobility, integrability, reusability, discoverability, and expandability.

- **Agility**—The overall requirement from which all others stem is agility. An agile enterprise forms solution can quickly adapt and respond to market or regulatory changes, embrace new technologies, and ensure consistency to the end user. To accomplish this, templates are used to provide a base level of enforcement or guidance without impeding the speed with which forms are provided. Forms designers can add desired components to these templates and apply government- or corporate-sanctioned styles. Enterprise-level forms solutions provide designers with access to complex functionality through wizards, sparing IT staff involvement, which allows them to focus on deeper technical issues.

- **Scalability**—Large organizations aim to expose hundreds (or thousands) of forms to users. Yet they often aren't able to capitalize on opportunities to use digital forms and documents as a strategy to effectively connect people to processes. Why? In a nutshell, the sheer magnitude of forms processes used by many organizations makes it hard to do this effectively at scale. What does scale mean in the context of forms processes? As an example, a state or province social services agency might deliver dozens of benefit programs for its citizen population—each benefit program may require hundreds of forms to support processes around applications, account changes, reporting, and working with providers. The forms workflow through these processes would be enormous, but the appropriate enterprise forms solution can meet the challenge.

- **Mobility**—For forms mobility, the goal is to create forms once and use them everywhere. Given constant and rapid technology changes, enterprise forms solutions must be able to accommodate the full breadth of existing technologies and adapt to new ones. Your solution should have the broadest possible reach, from paper forms to the latest mobile devices to future technologies.

To take this a step further, effective enterprise forms will provide an accessible, offline, compliant set of forms that utilize the specific functionality of all devices like various user interface elements including date picker, geolocator, camera support, and others. From the mobile viewpoint, multiple subchannels would be provided, browser-based forms (like a driver's license form) for infrequent users versus application-based forms for captive users like field workers.

From the perspective of forms designers, multiple templates would not be required for each delivery channel. Optimally, a single template would be used for all device types to provide users with a consistent experience.

- **Integrability**—Enterprise forms software captures, processes, and stores data. A solution must provide for integration into other transactional systems or systems of record. Every organization has simple processes that use simple forms (such as a survey) requiring no back-end integration; an easy-to-use tool with basic functionality (like spreadsheet export capability) could be used. Most organizations also have many complex processes with multiple system touchpoints, forms, delivery channels, formats, and decision points. The form is merely the user interface layered over an application. Critical forms process from three perspectives:

  1. Design time
     - Ability to bind to an Extensible Markup Language (XML) schema
     - Web service integration that is supported across the target user devices
     - Support for multiple submission methods
  2. Back-end integration
     - Support for process initiation via a variety of end points like web services, email, and watch folder
     - Back-end processes are extensible, allowing for custom integration
     - Out-of-the box support for common systems, such as a content management system
     - Extensive integration protocols like web services, Java™ Database Connectivity (JDBC), File Transfer Protocol (FTP), and Lightweight Directory Access Protocol (LDAP)
  3. End user
     - Seamless support for authentication such as single sign-on (SSO)
     - Ability to protect personal information

When design time, back-end integration, and end user perspectives are properly addressed by an enterprise forms solution, the resulting integration provides for smoother, more efficient operations.

- **Reusability**—One objective is to create common elements and use them across as many forms as possible. An enterprise forms implementation typically has a cross section of elements that are common to multiple, if not all, forms and documents being produced. By taking a holistic approach to an implementation, these common elements can be uncovered. Forms designers can share objects in a global manner and add to these elements over time as new forms are built. Common shared elements should include:
  - Scripts
  - Atomic form elements, like data capture fields with a custom pattern for formatting/validating
  - Common form segments, like a forms header
  - Library of templates as a starting point to allow for consistency in the look of associated template types

By sharing elements, it is possible to update one form, and then rapidly reflect the changes across hundreds or even thousands of other forms. This might be needed when an organization changes corporate logos or when new legal boilerplate text must be updated across a swath of forms. And shared asset repositories make it easy to discover library elements, conduct dependency or impact analysis on potential changes, and streamline publishing version changes.

- **Discoverability**—Discoverability breeds self-service, and the user experience has become key to the success of any application. If users can't find what they need on the Internet, they'll abandon the request. To avoid this, the portal of choice should allow for easy selection and rendering of forms. When forms are added to the repository, they should be versioned and published as specified. Non-IT personnel should be able to easily drag and drop form components onto the website editing interface to optimize the end user's ability to find, fill in, and submit forms via a website or portal.

- **Expandability**—Complete forms processing requires expandability to meet growing organizational needs. In most enterprise forms implementations, the forms capture requirement is only part of a complete system. In many cases, additional document processing is required. What starts as a forms data capture solution is likely to expand to encompass outbound communication to users, content security, and signature components. For example, a form submission might have a variety of attachments that need to be combined and watermarked for further processing. Or a heightened sense of security might prompt a user to verify that a document originated from a trusted source and that the content being sent is secure. Often, a form submission results in correspondence—either human-customized or system-generated. Regardless, a comprehensive forms and document platform provides the capabilities to capture, communicate, and secure. And the solution must be fully capable of expanding as needed by the organization.

Architectural considerations

Delivering enterprise forms capabilities to meet organizational requirements is easier when a platform adheres to certain architectural principles. These include separation of data and presentation, standards, and fidelity and compliance.

Separation of presentation and data

Separating the presentation of a form or document from its data allows the presentation to adapt to the user's context while the data adapts to the process context. A user's context may change based on the client software, device, location, or activity. For example, a user may require rapid data collection on a simplified user interface while working out of the office but need to produce a more formal document that complies with an organization's regulations at the end of the day. The separation of presentation and data allows content, structures, and logic from the presentation template to be used in both environments. Similarly, the data can then be used in other process contexts that may be transparent to the user of the form. The user does not necessarily require knowledge of the larger organizational process beyond the requirement to enter data. Data can flow between enterprise systems to enable other organizational processes to spawn new activities or augment the data with new information before it appears in a form or document.

Use of standards

The use of recognized standards within a form and document processing platform allows an organization to both integrate with other systems of record and future proof against industry or software vendor changes. It's important to note that platforms incorporating standards with broad industry adoption are the goal here. Standards like XML, HTML, PDF, Simple Object Access Protocol (SOAP), Representational State Transfer (REST), and Java Enterprise Edition (Java EE), along with design principles such as Service Oriented Architecture (SOA), have stood the test of time and are unlikely to fall out of favor like some more recent standards that have unknown futures. A platform that uses these standards ensures that assets remain interoperable and usable while the platform itself is able to connect to and exchange data with other systems for many years to come.

Fidelity and compliance support

Forms and documents are at the core of government agencies and industries including financial services, insurance, pharmaceutical, health care, life sciences, and manufacturing. Organizations like these require sophisticated forms automation to ensure that review and approval processes are completed in a timely and accurate manner, forms adhere to required details, and regulatory compliance can be assured and verified.

For example, in the financial services and insurance industries, process standards like those from the Association for Cooperative Operations Research and Development (ACORD) or Mortgage Industry Standards Maintenance Organization (MISMO) often dictate business form structure and content. Similarly, manufacturing organizations employ forms across the entire product lifecycle, from idea generation to engineering and design, to manufacturing, delivery, and servicing. The industry is also a heavy user of forms for maintenance, repair, and operations (MRO) activities, with the forms often becoming the official archived record used to ensure and verify regulatory compliance. And privacy regulations create significant challenges

for forms automation in the healthcare industry. Regulations like the Health Insurance Portability and Accountability Act (HIPAA) stipulate what information can and cannot be shared and when patient permission is required before information can be shared. This creates an additional approval layer in many processes and also requires protection of information so that only authorized personnel can access it. Electronic forms and documents must frequently support both electronic signatures and encryption when employed in the healthcare industry. While privacy regulations must be accounted for in an enterprise forms solution, so too must accessibility mandates. Building accessibility into forms is a requirement when supplying documents in regions where compliance with accessibility standards is mandated. In the United States, for example, accessibility standards such as Section 508 of the Rehabilitation Act exist to ensure that information technology is available to all users, including government employees with disabilities and members of the public with disabilities that use government services.

A consistent presentation of form elements across processes and organizations is required to ensure compliance with standards and regulations. The enterprise forms solution must comply with these requirements by providing pixel perfect forms in document layout and information security—no matter where the information is stored or how it is used.
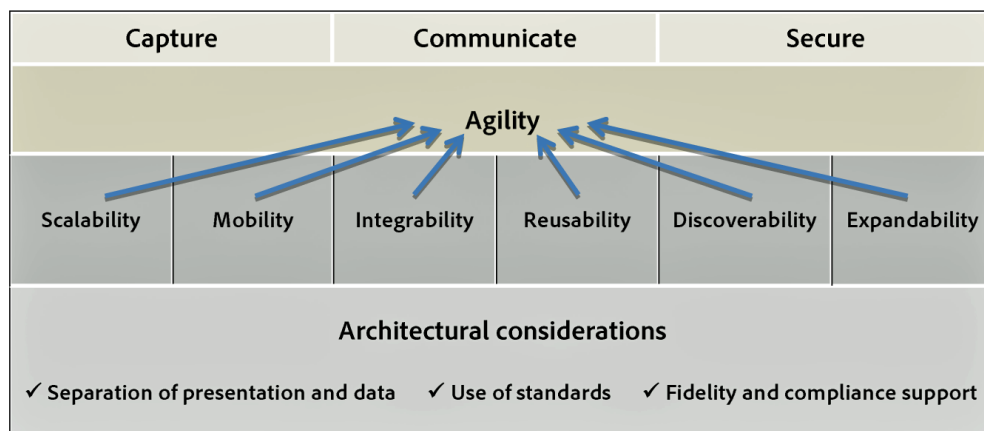
Enterprise forms successes

The benefits of investing in an enterprise forms solution are immense and varied. Here are a few highlights to illustrate how businesses and government agencies alike are vastly improving their operations:

- The State of Illinois, Department of Human Services—Reduced administrative costs by $6 million annually.
- Dickinson Financial—Streamlined processing of up to 20,000 service requests weekly, translating into annual savings of hundreds of thousands of dollars.
- Illinois Municipal Retirement Fund—Accelerated the generation of member statements by 68% for over 260,000 members.
- U.S. Government Printing Office—Saved $1 million and 20 tons of paper over five years by delivering the U.S. Budget digitally.

Next step toward an enterprise forms solution

As evidenced in the preceding list of successes, transitioning forms to the enterprise level can significantly improve operations. The following chart summarizes the functions and requirements to consider as you evaluate enterprise forms solutions for your organization.

Summary

The obsolescence of paper forms is approaching as technology and common trends begin to demand more efficient handling of forms and documents. Organizations can move forward with confidence in evaluating enterprise forms solutions given the vast capabilities currently available and the operational benefits to be had. Today's robust enterprise forms technology will work hard to improve the agility of your organization.

For more information

Solution details: *www.adobe.com/solutions/government.html*