DOCULABS

Doculabs MarketFocus White Paper:

Review of the Adobe Intelligent Document Platform and Adobe LiveCycle

Adobe

Given that so many business-critical processes and operations are driven by documents and forms, it makes sense for IT organizations to consider the use of document services in their applications – especially in the wake of accounting scandals and new regulations and compliance mandates. Of course, IT organizations need to address document services in a manner that is consistent with the organization's overall architectural approach. For IT organizations that are standardizing on services-oriented architectures, there is a need for a common set of document services that can be used to develop document and forms applications for use across the enterprise. Such an approach minimizes the use of redundant systems and silo'd applications, while improving IT's flexibility to respond to changing business requirements.

Adobe's approach for providing services-oriented document and forms solutions to IT architects and developers is the Intelligent Document Platform. The platform consists of universal clients, document services, and intelligent documents. On the document services side, Adobe recently released Adobe LiveCycle, which includes a number of software products that provide core document services. These services are designed to align with services-oriented architectures (SOAs) that organizations are deploying, and to leverage open standards like J2EE and XML. This approach makes Adobe LiveCycle a good fit for the architectural directions and best practices of many organizations.

Adobe recently commissioned Doculabs to conduct a formal review of a number of products in the recently-shipped Adobe LiveCycle offering. This paper provides Doculabs' review of these server products, and provides IT architects and developers with perspective on how Adobe's offerings can be used to develop solutions for the enterprise.

What's Inside

At a Glance

Provides a snapshot of current background information on Adobe Systems, Inc.

The Business Case for Enterprise Reference Architectures

Describes why CIOs and their IT architects are interested in enterprise reference architectures, and how such architectures can address business drivers for reducing risk, improving business efficiency and flexibility, and rationalizing IT investments.

Where Document Services Fit

Explains the importance of document services within an enterprise reference architecture, and highlights the types of applications that such services can support (such as customer self-service, document processing automation, personalized correspondence, etc.).

Adobe's Approach: The Intelligent Document Platform

Describes the Adobe Intelligent Document Platform approach to delivering document services that can fit into enterprise reference architectures.

Adobe LiveCycle Solution Review

Provides Doculabs' review of some of the major server-based products and components within the Adobe Intelligent Document Platform, which are among the first Adobe LiveCycle products to ship.

Key Benefits

Highlights a number of key benefits that the Adobe Intelligent Document Platform and Adobe LiveCycle products can deliver, highlighting how IT organizations can take advantage of the technology to realize the value of their enterprise architecture strategies.

Final Word

Provides Doculabs' overall opinion of the Adobe Intelligent Document Platform approach.

At a Glance

Adobe Systems, Inc. ***345 Park Avenue*** ***San Jose, CA 95110-2704*** ***408-536-6000*** ***www.adobe.com***	
Founded:	1982
Stock Symbol:	ADBE
Revenues:	$1.2 billion
Employees:	3,700
Office Locations:	Headquartered in San Jose, California, with offices in numerous U.S. cities and more than 15 countries worldwide
Overview:	Adobe provides world-leading digital imaging, design, and document technology platforms for consumers, creative professionals, and enterprises. For enterprises, Adobe provides the Intelligent Document Platform, which enables organizations to connect employees, customers, and partners with information through the use of Adobe's PDF file format—the de facto standard for secure electronic document exchange.

Table 1: Adobe at a Glance

The Business Case for Services-Oriented Enterprise Reference Architectures

IT architects are faced with a multitude of challenges and pressures as they serve the needs of their businesses. Of course, IT architects must improve customer satisfaction and efficiency of their operations, while reducing overall risk. In addition, they need to rationalize their technology investments and optimize their existing environments. Finally, IT organizations need flexibility to add solutions or respond to business needs with technology solutions that can be deployed on a common environment.

More and more organizations are implementing service-oriented reference architectures, in which functionality is exposed as "services" that IT architects and developers can access using approaches such as Java interfaces or Web services. This approach provides IT with benefits including increased flexibility, reduced programming time, and ease of integration.

With this in mind, many IT architects are moving toward developing **reference architectures** for their enterprise technology environments. A reference architecture is a defined framework that identifies the key service layers and technology components required, and the overall standards that will be used in the environment. By using such an architectural model as a backdrop, IT architects can ensure that their IT investments are guided by a sound technology strategy that positions the organization for long-term agility and success.

The modern reference architecture is **service-oriented**, providing a set of reusable and accessible services to deliver functionality to applications. This encompasses the need for event-driven processing, integration, and the ability to leverage existing applications and infrastructure. Ultimately, a sound services-oriented architecture (SOA) provides a number of benefits:

- The ability to adapt to changes in business conditions faster than has been possible in the past, and allow business users to be closely involved with (and in some cases, even own) changes in business processes
- The ability to reduce the amount of time spent developing custom code and complex applications, using business processes to assemble applications rather than requiring the use of declarative programming
- Significant cost savings over time, as more of an organization's existing investments in technology and systems are leveraged rather than replaced
- Ease of integration with other service-oriented offerings provided by other solution providers
- The ability to re-use and leverage utility services (such as security and document services) across a wide-variety of applications throughout an organization

Accordingly, organizations that are adopting services-oriented architectures are looking to technology solution providers that share the same vision and approach. Unfortunately for customers, many technology solution providers offer technology that is not yet services-oriented, and in some cases does not even support key standards. This makes the technology much harder to customize and integrate with existing systems and applications. Over time, we expect that organizations will insist that any technology solution that they include in their IT environments will be services-oriented and provide standards-based architectures.

Where Document Services Fit

There are many common infrastructure services provided by a good enterprise reference architecture, including security, presentation services, and data services. Such services must address two major types of data that exist in most organizations today: structured data (commonly found in the form of relational databases, XML, and other well-defined data structures), and unstructured data (such as documents, paper forms, e-mail, engineering documents, and other content).

Unstructured data typically makes up more than 80 percent of all data in an enterprise. This type of data is characterized by a lack of well-defined structure within the content, and an overall lack of meta-information related to the content. Therefore, in the modern reference architectures being designed and adopted today, document services play a significant role in the overall picture for enterprises looking to build valuable solutions that leverage their existing data.

Document services represent a key set of services to incorporate in a services-oriented architecture. With a good set of re-usable document services, IT developers and architects can access functionality for use across multiple applications, reducing development effort and reliance on disparate systems or point solutions.

Document services are critical because they can help the business improve its operational efficiencies. Documents drive many business processes, but traditional document processing approaches are inherently manual, error prone, and time consuming. Technology – in the form of document services – can be the catalyst to improve and automate such processes.

Document services can also help the business reduce its risk and help ensure regulatory compliance. And there is more focus on document services now than ever before, given the increased scrutiny on content due to existing and emerging regulatory requirements and stringent records management demands in the wake of corporate accounting scandals.

In most large organizations, multiple technologies or products have been deployed to deliver various document services – often at the departmental or business unit level – in order to address requirements for a business group or specific application. This creates a burden on IT organizations and budgets, as IT must maintain and support multiple heterogeneous and proprietary systems that offer redundant or overlapping capabilities.

The fact is, there are a number of baseline capabilities that are common to many types of document-centric applications for information presentation, as well as for electronic form applications that involve interactive documents in which users can enter data or perform other actions through interactive elements such as buttons or other graphical controls. These baseline capabilities include form and document generation, document distribution, document collaboration, document access control and security, and workflow for document- and form-driven processes. If all of these functions were available to IT developers as discrete services, they could be used as needed in building customer applications on a common platform.

Thus, for large IT organizations, it makes sense to consider the merits of standardizing on a "services" approach or service-oriented architecture for document services. In such an approach, **all relevant document and forms management functions are available as reusable services that IT architects and developers can use to develop multiple applications.** This approach is far more flexible than continuing to use and support silo'd solutions that each have their own duplicate services. This also means that IT organizations have only one set of services to learn, and it reduces IT and user training requirements.

By using a common set of services, IT organizations can effectively address their considerable breadth of document-centric applications, such as:

- New account origination and enrollment forms applications
- Policy generation applications
- Contract management applications
- Billing and statement generation and distribution applications
- Customer service correspondence applications
- Customer self-service applications
- Marketing applications
- Sales management applications
- Publishing applications
- Document retention for compliance and records management

As mentioned, IT architects often limit their technology options to solution providers that share the same architecture vision that they have adopted. This means that as services-oriented architectures become more widely accepted by IT organizations in general, so too will a services-oriented approach to addressing document-centric applications.

Adobe's Approach: The Intelligent Document Platform

Adobe's approach is to provide organizations with a platform to deliver a key set of document services that IT developers can use to develop solutions for document and forms applications throughout their organizations. The platform's services are designed around a services-oriented architecture, and they are based on open standards like J2EE and XML. This approach makes the platform a good fit with the architectural directions and best practices of many organizations.

Adobe's implementation of this vision is its Intelligent Document Platform, which consists of:

- **Universal clients** (the ubiquitous Adobe Reader or standard web browsers), which allow users to easily view documents and access functionality and services. The fact that universal clients are already on users' desktops offers numerous benefits. For example, user familiarity with the universal client leads to faster adoption, as users do not need additional training. In addition, there is no need for the installation and maintenance of proprietary client software.
- **Document services**, which provide key functions such as document generation, document control and security, document collaboration, and process management for electronic forms – extending functionality to users in a familiar document-based paradigm.
- **Intelligent documents**, which are represented in formats such as the ubiquitous PDF format and XML, and which can serve as a vehicle for collaboration, document security, and process automation. Intelligent documents encompass presentation, data, metadata, and business logic. Thus, intelligent documents provide all the user accessibility and readability of a traditional document, but also offer the power of being able to interact with a process without custom programming.

By providing universal clients, document services, and intelligent documents as part of an integrated platform, Adobe offers a compelling combination that can address a wide range of document-centric applications across the enterprise.

Adobe is well known for its universal clients, leveraging the company's widely accepted Adobe Reader, Adobe Acrobat, and PDF document technologies. By offering universal clients, document services, and intelligent documents as part of an integrated platform, Adobe provides IT architects and developers with a compelling set of technologies that can address a wide range of document-centric applications across the enterprise – all the way from the back-end servers in a data center to the user's desktop.

Adobe's Intelligent Document Platform approach and its document services differ from commonly-available content management systems in that they provide a higher level of services that can leverage and complement existing systems. Many organizations have existing investments in one or more content technologies, which make development of content-based applications a complex undertaking. Adobe's Intelligent Document Platform provides developers and architects with standardized document services that can be used to build solutions that leverage underlying content management systems, without worrying about the vagaries of the specific products.

As shown in the figure below, the Adobe Intelligent Document Platform approach is designed to leverage existing investments in repository, middleware, and content management technology to provide higher-value services upon which powerful content and process applications can be built. The services-oriented approach is designed to reduce application development effort while maximizing the value provided to users.

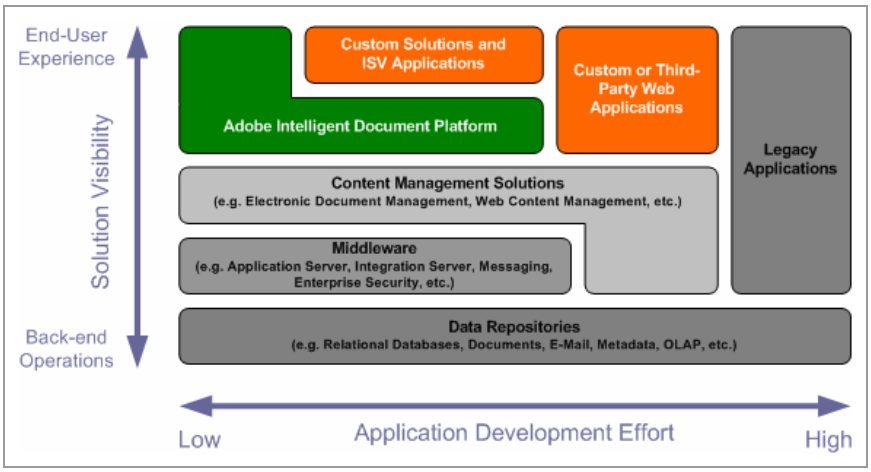

Figure 1: IDP Approach (Source: Doculabs)

Adobe Document Services

The key technologies that bring solutions together for customers are Adobe Document Services, delivered on the desktop through Adobe Reader and Acrobat, and delivered on the server through Adobe LiveCycle. The Adobe LiveCycle products work together to provide organizations with the services they need to configure robust applications for document processing, forms management, and document-based process management.

Specifically, Adobe LiveCycle is designed to provide services required at key stages of the document lifecycle, using a technology framework that fits into organizational architectures and makes sense for organizations embracing services-oriented approaches.

Adobe's products provide services in the following categories:

- *Document generation* – Provides the ability to create unified documents from source material and commonly available productivity applications
- *Document collaboration* – Allows Adobe Acrobat and Reader users to interact to create documents in work groups; features include capabilities such as document annotation, commenting, highlighting, and much more
- *Document control and security* – Ability to integrate security into documents such as digital signatures, encryption, document control (setting rights on the ability to save, print, or manipulate the document in different ways); this includes digital rights management capabilities to ensure document security and control within and beyond the firewall
- *Process management* – Provides functionality to enable document driven processes and workflow (from intelligent data capture to forms management to dynamic and offline data capture)

This strategy allows IT architects, IT developers, and third-party solution providers and integrators to use Adobe's technology to build and deploy flexible, scalable applications to address a variety of document and forms application requirements. In addition, Adobe's services-oriented approach makes it easier for developers to integrate Adobe LiveCycle with line-of-business systems, enterprise content management (ECM) systems, and other back-end systems.

The following figure provides a conceptual architecture of Adobe's services-oriented Intelligent Document Platform offerings for document services.

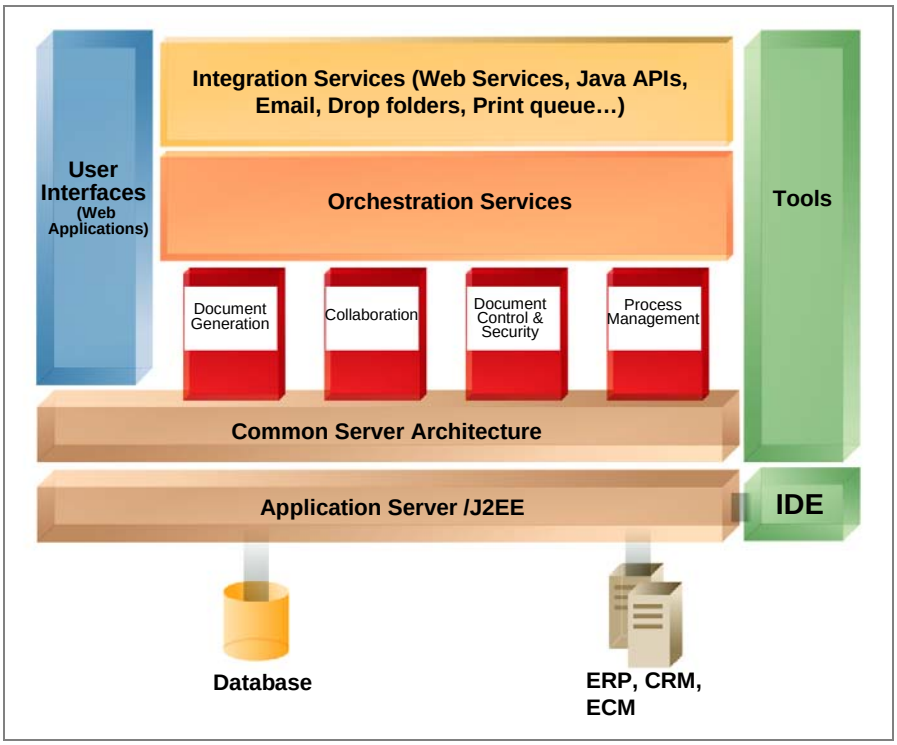

Figure 2: Conceptual Architecture of the Adobe Intelligent Document Platform and Adobe LiveCycle (Source: Adobe)

Adobe LiveCycle Review

Adobe commissioned Doculabs to perform an in-depth review of some of the key Adobe LiveCycle components in the Adobe Intelligent Document Platform. This section provides Doculabs' review of:

- **Adobe Designer** – the design environment for building intelligent XML form and document templates that can be rendered as HTML or PDF forms by the Adobe Form Server (which can then extract data from the forms as XML data for use in core business systems).
- **Adobe Form Server** – the deployment engine and runtime environment for rendering forms built in Adobe Designer, providing processing services (such as data pre-population, server-side validations and processing and structured XML data extraction) for form applications.
- **Adobe Form Manager** – provides a centralized repository for managing all your business forms (including those created in Adobe Designer and those created with other tools).
- **Adobe Document Security Server** – provides services document encryption and digital signature support on PDF forms and documents.
- **Adobe Reader Extensions Server** – provides advanced services and functionality for documents or forms accessed by Adobe Reader clients, extending users' capabilities (such as local save, digital signatures, collaboration, etc.) for participating in form applications or workflows without requiring full Adobe Acrobat software.

Adobe provides a number of other technologies, including Adobe Reader, Workflow Server, Document Server, and Elements Server. However, for this paper, Doculabs only reviewed the current versions of the products listed above (which are among the first Adobe LiveCycle products to ship).

Key Underlying Technologies in the Adobe Intelligent Document Platform

Adobe's Intelligent Document Platform leverages a number of key underlying technologies, including:

- PDF – Adobe's Portable Document Format has become an open and well-defined document format for the common representation of high fidelity documents and electronic forms
- XDP – A new XML – based format that allows organizations to bundle documents and data in a single XML package. This allows documents to easily participate in XML-based workflows and processes while maintaining features such as document fidelity and transportability of multiple documents in a single package
- "Intelligent" documents – Documents that incorporate high-fidelity presentation with integrated data and business logic that can drive the behavior of the document or form (including the ability to embed processes or to participate in larger enterprise workflows)

General Architecture

From an architectural perspective, Adobe's goal is to provide a common server architecture for the products within the Adobe LiveCycle offering. This architecture has two major design goals:

- **To provide services that can fit into an organization's services-oriented architectures (SOAs).** That is, while Adobe's offerings are available as packaged products, they also comprise a set of services that developers can use to build custom applications using Java components or Web services. Adobe's stated direction is for its services to be exposed as Web services wherever appropriate. While the existing product set has not been fully transitioned to this model, many commonly used components are already Web services-enabled.
- **To run in a J2EE application server environment**. This provides Adobe's technology with portability and interoperability on multiple platforms, with the ability to leverage low-level services provided by the application server and enterprise middleware layer.

For IT architects and developers that are considering the Intelligent Document Platform and LiveCycle, it is important to understand how the various pieces will fit into an overall IT environment. The pieces are flexible, and can be deployed in many configurations depending on the application requirements. For example, the following figure depicts how the various Adobe LiveCycle technologies work together within an IT architecture in a workflow-centric scenario.

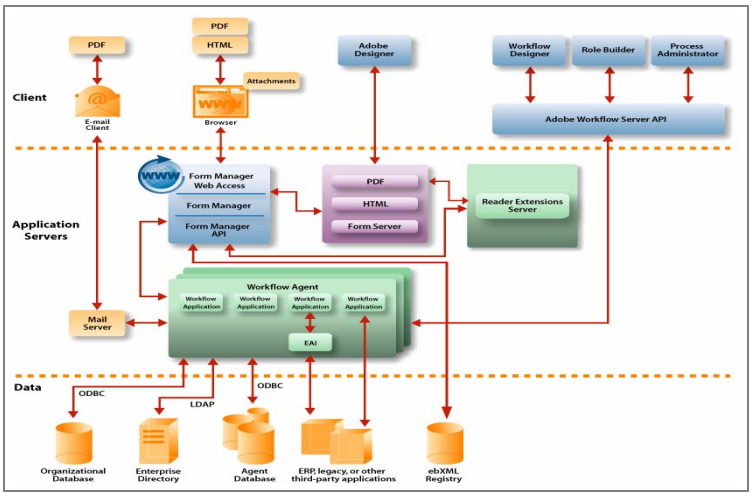

Figure 3: Workflow-centric LiveCycle Deployment Architecture example (Source: Adobe)

For IT architects and developers implementing services-oriented architectures, it is important to understand the types of discrete services provided by the Adobe Intelligent Document Platform and its server products. The following figure illustrates the capabilities and services that the Adobe Intelligent Document Platform offerings provide, within the larger context of document services that Doculabs believes organizations require. The figure shows where the Intelligent Document Platform provides full services, partial services, or no services in its current version.

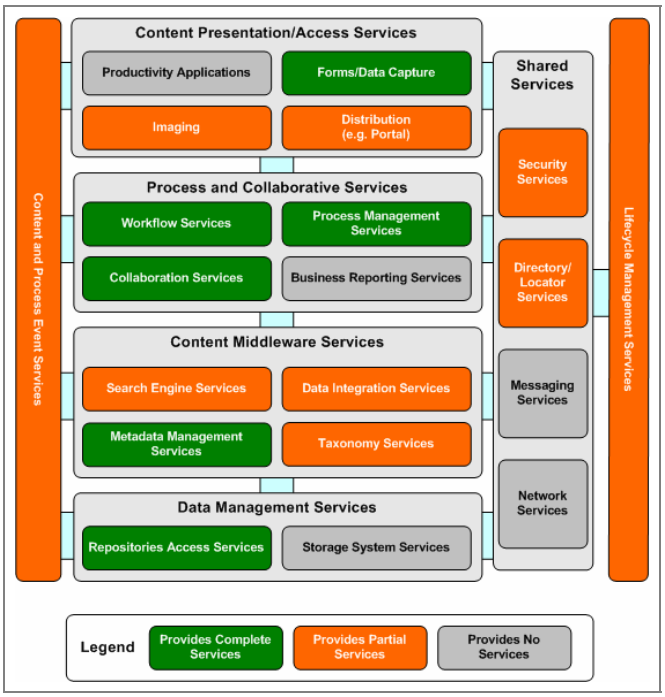

Figure 4: Document Services Available with the Adobe Intelligent Document Platform (Source: Doculabs)

Product Reviews

Adobe Designer

Adobe Designer allows authorized designers to define documents and electronic form templates based on XML, which generate PDF forms or XDP files (which can then be rendered in PDF or HTML format at runtime for presentation to the user). The Adobe Designer can be used to design form templates and data-driven or event-based dynamic document templates.

Templates created in Adobe Designer can be managed in Form Manager (or any content repository) and deployed via Form Server – thus providing a combination of services that comprise a complete electronic form solution. Designer not only converts existing PDFs, but also forms from Microsoft InfoPath and Word, and forms templates from legacy JetForm/Accelio products (the predecessors to Adobe Designer).

The Adobe Designer's interface is intuitive, providing a breadth of form authoring and layout features. It includes a library of standard form components (such as buttons, dropdown lists, and entry fields) that can easily be added to a form template in a drag-and-drop fashion.

Defining fields and data mapping for a form is a simple point-and-click exercise. Designers can map a form to data sources including XML data, XML schemas, OLE DB-compliant data sources, and Web services' WSDL files. This creates a schema and data view for the form, and specific fields in the schema can be mapped and bound to individual form fields. Designers can then preview the forms to see how they will look in deployment.

Adobe Designer also allows designers to create custom objects for use in a form. Object behavior and other form rules (such as database lookups, variable inserts, and calculations) can be defined using either JavaScript or FormCalc (an embedded scripting language for calculations), providing good flexibility. Adobe Designer's object library enables reuse of objects across form templates by multiple designers, but does not store all rules as reusable objects. Overall, form design processes are likely to involve both business users and IT; business users can handle layout tasks and some FormCalc scripting, while relying on a JavaScript programmer to complete the form design and a Java programmer for more complex integration or application development tasks. The system lacks wizards that would enable business users to take on more of the design process with less IT involvement.

A key strength of Adobe Designer is its ability to design dynamic forms. Such forms make life much simpler for users completing the forms; the form itself can display different fields and prompts based on data entered in the form, guiding the user to complete the form in an accurate manner.

Another strength of Adobe Designer is its ability to save form templates in XDP; at runtime, the Adobe Form Server can render the form for the user in PDF or HTML, providing true deployment flexibility. PDF forms resemble paper forms that are familiar to users, and PDF often makes sense for longer forms that may need to be completed offline. HTML makes sense for shorter forms that can be quickly completed in a web session. Both PDF and HTML make sense in cases where the user's desktop environment is unknown.

Adobe Form Server

Adobe Form Server is the deployment runtime engine for form and data capture applications. The system renders forms to users, and handles the processing required to transfer completed forms into business processes.

A key benefit of Adobe Form Server is its ability to detect the client's Web browser environment, and to deliver the optimal form format for that environment, from the same form definition. Adobe Form Server identifies the type of browser requesting a form, and the client features enabled (such as client-side JavaScript execution). Based on this identification, Adobe Form Server renders the form in the optimal format, which may include PDF, HTML, or Accessible HTML (aHTML) that provides additional application and graphical richness within the browser.

The Adobe Form Server runtime engine also handles all server-side processing defined within the form and driven by user data entry, including server-side calculations, field validations, and dynamic data processing. Rich text input fields can be used to support margins, tab, different fonts and attributes. Finally, Adobe Forms Server handles processing related to data pre-population and XML data extraction.

Adobe Form Server can be deployed on many platforms that use a J2EE application server, including IBM WebSphere and JBoss. SNMP and JMX will be used for system reporting in the future. Server-side scripting supports simple browser-based client environments, while client-side logic can be leveraged by users with Adobe Reader or Acrobat or even in Web browsers in some cases (such as client-side calculations in HTML). Regardless of the rendition of the form (PDF or HTML), the form object model used for scripting remains the same, so the same script will run whether the XDP is rendered as HTML or PDF.

Exposing additional features to Adobe Reader users (such as digital signatures and dynamic forms) can be activated through the use of Adobe Reader Extensions Server, which is discussed later in this paper.

Adobe Form Manager

The Adobe Form Manager is a centralized server-based library or repository for form templates developed in Form Designer, and may be deployed with Form Server. Adobe Form Manager can also store any file type, providing version control and access control to the files it manages. The product is fully J2EE-compliant, and can be used with Oracle, IBM DB2, or MySQL as its underlying database.

Adobe Form Manager provides a Web-based interface that allows users and administrators to select particular forms for completion. The form library can be presented in an intuitive, categorized folder hierarchy, and users can also search for forms using fielded searches.

This approach makes great sense for scenarios in which users have to select from a large collection of form templates in order to complete their job functions. For example, customer service representatives that need to access and complete forms in response to customer inquiries have an easier way to locate the specific forms they need from a collection of hundreds or thousands of forms. Likewise, the Form Manager interface can be exposed through an intranet, providing employees with access to corporate forms for human resources or accounting and administration functions.

Form Manager can store user profile information. When a user selects a form for completion, Form Manager delivers it pre-populated with information drawn from the user's profile (such as name, employee ID number, etc.). The profile information (along with the form definitions and descriptions) is stored in a standards-based ebXML repository and managed by an ebXML registry.

The Form Manager interface also provides internal users with a "My Forms" tree that allows them to save drafts of forms they are in the process of completing. The My Forms view also allows users to archive completed forms, maintain lists of their favorite or frequently-used forms, and maintain a work list history of the forms they have initiated or to which they have contributed. This same interface provides users with an interface for Adobe WorkFlow Server (if deployed in the same environment).

From the administrator's perspective, Form Manager allows the definition of access permissions for form designers and form users, restricting users from either creating forms or completing certain form types. Form Manager also provides a Category Editor that allows administrators to create form categories and group forms into particular categories – organizing the forms into intuitive categories for users.

Overall, the Form Manager approach makes sense for organizations that simply want to improve their form template management and centralize their template control, without deploying a full-fledged enterprise content management (ECM) application. For organizations that already use an ECM, it may make sense to deploy Adobe's technologies without the Form Manager service, leveraging the existing repository infrastructure to manage form templates as well as completed form transactions.

Adobe Document Security Server

Adobe Document Security Server provides services to ensure trust, protection, integrity, confidentiality and non-repudiation of documents. The service is critical for document applications involving sensitive information or requiring high security to safeguard information.

Adobe Document Security Server includes APIs that can be called by other applications. The server applies security to the PDF document itself, prohibiting tampering.

The types of security services that Adobe Document Security Server delivers include:

- Document encryption and decryption with passwords or public keys
- PDF certification and certificate validation
- Digital signatures for PDFs
- Hardware security module (HSM) integration

Adobe Reader Extensions Server

Adobe Reader Extensions Server manages the provision of additional functionality to Adobe Reader clients. Organizations can use Adobe Reader Extensions Server to provide certain Adobe Acrobat functions to Adobe Reader users, without requiring them to have full Adobe Acrobat licenses. This approach makes great sense for organizations that want to extend their forms applications to users outside the firewall.

For example, a financial services firm that wants to allow customers or prospects to enroll for a new account or a loan can use Adobe forms technology and Reader Extensions Server to make the process easier for applicants. External Reader users can save a form locally to complete it offline at their convenience, add their digital signature, and submit it back to the financial services firm via e-mail.

The specific features (that are provided in Adobe Acrobat but not in the free Adobe Reader) that can be activated for Reader users via Adobe Reader Extensions Server include:

- Saving forms locally, so users can fill them out at their convenience without requiring a live connection
- Digitally signing a form
- Annotating a document using collaborative review and markup tools
- Submitting forms via e-mail or offline
- Using forms connected to a database
- Attaching files

Adobe Reader Extensions Server works by assigning usage rights to a PDF document or form. This can be done using Adobe Reader Extensions Server's interface, the Form Manager administrator's interface, or calls by other applications to Adobe Reader Extensions Server's API. At runtime, the Java-based Reader-extended document or form enables the specified features assigned to a form to be exposed in Adobe Reader.

Key Benefits

Based on our review, Doculabs finds that Adobe LiveCycle offers IT organizations a number of key benefits. For example, Adobe LiveCycle:

- **Provides IT architects and developers with a flexible set of services and a framework for building out solutions.** Adobe's server products provide services for document generation, document collaboration, document security, and process management. Developers can leverage these services in building solutions for their organizations.
- **Is designed to work well in services-oriented IT architectures.** By providing a set of flexible document services, Adobe provides an approach that enables IT architects and developers to access these common services across applications using Web services or Java components. This approach also aligns with IT strategies focusing on services-oriented architectures (SOAs) for the enterprise.
- **Leverages standards.** Many of Adobe's server-based products are generally based on Java and compatible with J2EE application servers, making them an ideal fit for organizations that have standardized on these technology approaches. In cases where product components are not yet Java-based, Adobe provides documented interfaces to which developers can program.
- **Leverage standard document and data formats.** Overall, all of Adobe's server products make extensive use of XML standards, promoting interoperability and standards-based information exchange and access.
- **Enable business users to play a larger role in developing and modifying applications.** Adobe's tools provide features that are intended to make the application design process more intuitive for business users, reducing IT involvement for certain aspects of the development process (such as making an initial design of a form template).
- **Take advantage of the ubiquity and user acceptance of PDF.** Adobe's solutions make extensive use of PDF, presenting an intuitive and familiar paradigm for users. In addition, this approach means that IT organizations will not have to deploy and maintain additional client software to support users that need to participate in document-centric processes.

Final Word

With its Intelligent Document Platform, Adobe is firmly moving in the direction of providing organizations with a platform and a set of services that can be used to create applications that run within a common reference architecture. Key to this strategy is Adobe's portfolio of document services products, which provide functionality that applies to wide range of document applications. This includes services for document generation, document collaboration, document security and control, and process management.

Overall, Doculabs found that Adobe's key LiveCycle offerings (Adobe Designer, Adobe Form Server, Adobe Form Manager, Adobe Document Security Server, and Adobe Reader Extensions Server) will provide IT architects and developers with the flexibility they need to create applications to address a diverse set of business requirements. The technologies reviewed for this report are all based on Java and J2EE in the current version, and Adobe has a clear roadmap to evolve its entire product set in this direction. In addition, the server products make extensive use of standards such as XML, which helps organizations ensure information accessibility.

The strengths of the Adobe server products, coupled with the ubiquity and acceptance of Adobe Reader and the PDF format, create a compelling case for organizations that want to evolve to a services-oriented approach for document and forms management and automation.

Strengths	Challenges
▪ Strong mix of services that can be brought together in a common platform for document services, with good flexibility ▪ Ubiquity of Adobe Reader fuels accessibility and user adoption ▪ Flexible use of XML as a core underlying technology; XDP documents can be readily integrated into XML workflows ▪ Adobe Designer allows design of data-driven and event-based documents and forms ▪ Adobe Designer can get to data through multiple methods (databases, XML, existing XML schemas, etc.); data mapping is a simple drag-and-drop exercise ▪ Ability to write code in both JavaScript and FormCalc (expression syntax) gives designers flexibility ▪ Forms can be rendered in PDF and in HTML (using the same data) appropriate for user's client type ▪ Allows creation of dynamic forms ▪ Automatically converts existing PDF, Word, and InfoPath forms ▪ Uses can save forms offline to work on them in separate sessions (for forms enabled with Adobe Reader Extension Server) ▪ Reader Extension Server makes great sense for extending functionality to unknown constituencies	▪ Large number of server product pieces can confuse developers as they try to determine what they need ▪ Adobe Designer provides a library to store objects for reuse, but it does not store all business rules as objects ▪ Reader Extensions Server APIs are not automatically available in Form Server ▪ Designer lacks rules wizards to simplify the design process for business users; improvements here would reduce the level of involvement for IT ▪ Some components still in C++ code base (full solution is not yet 100% Java, but integration with C++ code base is well designed and should scale well)

Table 2: Strengths and Challenges of Adobe Intelligent Document Platform

About Doculabs

DOCULABS

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Doculabs, Inc., is a technology consulting firm backed by research and extensive client experience. Our services lower the business risk of technology decisions through client specific recommendations, objective analysis, and in-depth research. Founded in 1993, Chicago-based Doculabs provides consulting services that are based on our fundamental belief that in order to protect a client's long-term interest, technology advisors should not be implementers.

Doculabs helps clients deliver on their business objectives through customized services that address technology initiatives related to business challenges in areas such as strategy development, technology acquisition, and go-to-market initiatives. Doculabs' consulting services are completely objective because the firm does not sell software or integration services. For more than 10 years, our research methodology has provided customers facing mission-critical challenges with the information and advice they need to make confident and well informed decisions.

Hundreds of leading organizations within the Fortune 1000 – from financial services companies to major technology software providers – have turned to Doculabs for assistance with their technology strategies.

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