



Streamlining the mortgage process with Adobe® LiveCycle® enterprise solutions

Using intelligent PDF documents to optimize mortgage data acquisition, authentication, and reuse

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Introduction

The mortgage lifecycle is a complex process involving numerous sources of information. Organizations in the mortgage industry create, use, and exchange a variety of documents based on information captured using paper forms, electronic forms, documents, and data files. Depending on the document media, the method of data transfer can vary from mail, courier service, and fax for paper documents to email, removable media, system-to-system interfaces, and web services for electronic documents. Regardless of the media and transfer method, at certain points in the process, information is repurposed.

Within electronic mortgages, information reuse generally encounters two primary obstacles: reentering data and the authentication of electronic data. In the first case, data extracted from one or more documents may be reformatted and rekeyed for use by another organization. In the case of authentication, the ability to verify the information in an electronic document frequently requires the validation of electronic data against a paper document with a “wet” signature. The business process can vary by organization and potentially within various departments of a single organization depending on the mortgage products, systems in use, partners involved, and regulatory requirements.

This white paper provides an industry-specific overview of the mortgage process from initiation to servicing to securitization in the secondary market. It includes some of the issues with data consumed throughout the process, as well as the source of that data. It describes how PDF documents integrating industry data standards proposed by the Mortgage Industry Standards Maintenance Organization (MISMO) as part of a total eMortgage package can help organizations avoid duplication in acquiring, keying, validating, and authenticating information or information sources. The paper concludes with description about how organizations using intelligent PDF documents in concert with Adobe LiveCycle enterprise solutions can provide the foundation for a repeatable, automated process, incorporating electronic signatures, as well as the management of policies and process workflow.

The current process

One of the most significant challenges in the lifecycle of a loan is the data itself. Data originates from many disparate sources using varied information media and processes. Information suppliers vary from borrowers filling out a loan application to credit repositories generating a credit score based on historical payment records. The media and methods of data collection, consolidation, and exchange vary by organization and potentially by department within a single organization depending on the systems used, partners involved, and regulatory requirements. For example, selected loan products or offerings can change the path the data takes through the process.

Information sourcing

Some examples of information contributors to the mortgage process are:

Borrowers—These participants provide a large amount of data for loan qualification. A significant amount of the data is confidential, and therefore, requires a reasonable effort on behalf of other organizations in the process to adhere to privacy regulations.

Lenders (primary market)—These holders of the note for the mortgage obligation generate substantial documentation packages with varying contents dependent on the terms of the agreement.

Credit repositories—The primary repositories, Equifax, Transunion, and Experian, provide payment and default history for the borrower, as well as a cumulative credit score. This information requires restricting access on an as-needed basis.

Property appraisers—These participants generate a report defining the market value of the property. Often the reports will contain photographs of the property, as well as comparable data regarding properties in the area.

Insurance companies—These organizations create insurance policies for hazards to the property such as fire and flood. Depending on the lender's terms of the mortgage, a Private Mortgage Insurance policy may also be required.

Closing agents—These agents generate documents using information from a number of parties in preparation for review and signing by the borrowers.

Local, regional, and national government agencies—These organizations record tax and title documents at local government levels.

Investors (secondary market government-sponsored enterprises (GSEs))—Freddie Mac and Fannie Mae consume and generate documentation during the purchasing evaluation and creation of mortgage-backed securities. They also consume information from multiple sources to ensure compliance with their government-mandated charters.

Servicers—As the party responsible for post-origination management of a loan, such as collection of payments, payment of taxes, insurance, and property inspections, servicers generate periodic statements for borrowers and the holders of the mortgage.

As illustrated in Table 1, a number of organizations in the mortgage lifecycle exchange various pieces of data. This requires them to reformat data, convert data codes (such as those used for product, occupancy, or loan purpose types), and map information from one data layout to another. All of these actions can introduce inaccuracies and potentially cause significant errors that could lead to costly business decisions.

Multiple information media

A further complication in gathering information from these disparate sources is the wide variety of formats in which the data is provided. In addition to information entered on paper documents, electronic data is captured directly from some sources. Organizations with previously coordinated partnerships may have defined system-to-system interfaces. In many instances, however, data from one source must be moved to another medium and mapped to another format many times for transfer or data authentication.

Information reacquisition

In some cases, multiple organizations requiring the same information may be forced to reacquire the data directly from the source because the integrity and authenticity of the originally supplied information cannot be validated. Reacquisition of information may incur additional costs and cause versioning issues, since the majority of the data involved is dynamic.

Obstacles to an effective mortgage process

The following list summarizes the major challenges with the current mortgage process:

- Multiple industry information sources use different data standards.
- Various information providers, consumers, and maintainers use differing methods of acquiring, transferring, and storing data.
- There can be diverse processes depending on mortgage products/programs and organizations involved.
- There is no standard method for authenticating discrete data sets, which hinders confident data reuse.
- Information must be converted and reformatted for exchange between entities within the process.
- Conversion between diverse media introduces data redundancy, data synchronization issues between media, and potential data errors.
- Paper-based information must be transferred to a digital format by scanning or manually entering individual pieces of data such as names, contact numbers, or account identification.
- Documents must be printed anytime signatures are required. Paper forms must then be tracked and maintained concurrently with electronic data.

An integrated solution for streamlining mortgage processing

In order to satisfy the mortgage industry's diverse requirements, a mortgage processing solution should provide certain capabilities for specific user roles:

Information providers—Information must be able to be easily captured from multiple sources and media. The information should be validated and certified at the source.

Information consumers—The documents created should be stored in such a way as to make consumption dependable, consistent, and easily accessible. The documents must support the functionality required by the consumer's organization.

Information maintainers—The technologies used must be reliable and fulfill the providers' and consumers' requirements, as well as the requirements of any relevant regulatory agencies. Additionally, metadata for access, context, and maintenance should be available and searchable.

Benefits of the Adobe solution

In the demanding mortgage industry, any competitive advantage that removes the encumbrances of antiquated paper-based processes, while reducing operating costs and turnaround times, is a win-win scenario for service providers and consumers. Such a solution would provide the following benefits:

Support for industry standards—As illustrated in Table 1, a number of organizations in the mortgage lifecycle exchange various types of information. Adobe LiveCycle Forms software enables users to streamline the process by supporting industry data standards such as those proposed by the Mortgage Industry Standards Maintenance Organization (MISMO). By combining MISMO XML data standards and PDF, organizations within the mortgage industry can easily and confidently exchange information without transformation or conversion.

Reduced data entry costs—The same data bound to the industry-standard XML data within LiveCycle Forms is used for both data processing and form presentation, which helps ensure data synchronization throughout the mortgage process. When initially populating a form, LiveCycle Forms can automatically pre-fill the data from back-office applications such as a Loan Origination System (LOS). For a form like the Uniform Residential Loan Application, which is typically completed manually, LiveCycle Forms can provide field-level help, as well as execute embedded field validation and business logic during data entry.

With Adobe LiveCycle Reader® Extensions software, form creators can enable their target audiences to complete forms with free Adobe Reader software, which is available on most platforms. The PDF form is entirely self-contained, including the form's view, the business logic, and the XML structure for data storage, so it can be completed offline while maintaining data validation and integrity. By using PDF, organizations can be assured that the form will maintain a consistent look and feel regardless of the environment and media used for presentation. Documents will be preserved long-term thanks to Adobe Acrobat® software's support for the PDF/A archiving standard as well as its backward compatibility with previous versions of the PDF specification. The power and flexibility of LiveCycle Forms can significantly improve data processing quality, while decreasing the cost of data entry.

Reduced paper handling costs—Adobe LiveCycle enterprise solutions help reduce printing and copying costs by leveraging electronic document distribution and digital signatures. Electronic document transfer also simplifies data exchange and eliminates the costs of faxing, mailing, and courier services. Additional cost savings can be achieved by replacing the requirement for paper filing, storage space, and document retrieval with eDocuments, recorded in eRegistries and stored in eVaults. In the event that a hard copy is needed in support of Uniform Electronic Transactions Act (UETA) requirements, an intelligent PDF form can be printed with the assurance that the paper and digital versions will maintain a consistent look and feel.

Compliance with accessibility requirements—Government agencies, such as the Department of Housing and Urban Development (HUD), are subject to Section 508 of the U.S. Rehabilitation Act. Subsection 1194.21 has the following requirements for electronic forms:

“...When electronic forms are used, the form shall allow people using Assistive Technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.”

Documents and forms designed for use with Adobe Acrobat 7.0 and Adobe Reader 7.0 can be optimized for use with Microsoft Active Accessibility (MSAA)-compliant screen readers and other assistive technologies to meet these accessibility needs for individuals with disabilities. Both Acrobat 7.0 and Reader 7.0 software for Microsoft® Windows® provide accommodation for a variety of conditions, including blindness, low vision, and limited mobility.

Adobe LiveCycle Forms helps ensure data integrity and consistency in the following manner:

- Helps provide a consistent look and feel between paper and digital versions of PDF documents
- Supports the use of mortgage industry-specific XML data standards such as those defined by MISMO
- Provides increased data integrity by merging structured data storage and validation with precise document presentation in a single container
- Enables automatic form pre-filling and data extraction by back-office systems
- Supports field-level help, embedded data validation, and business logic to help ensure data accuracy
- Enables accessibility for people with disabilities (Compliance with Section 508 guidelines)
- Provides long-term form availability through backward compatibility and the ability to “flatten” documents in support of archival standards such as PDF/A

Streamlined mortgage process

While Adobe LiveCycle software and PDF provide the framework to encapsulate the data, logic, and security of individual forms, the mortgage process involves myriad information that must be:

- Captured from many sources
- Extracted from many formats
- Combined into new documents
- Transferred to business partners
- Appropriately protected at every stage of the process

Adobe LiveCycle enterprise solutions provide a number of industrial-strength products to automate the acquisition, manipulation, distribution, and protection of information.

Managing business processes

Adobe LiveCycle Workflow software automates document-based business processes, handling virtually all facets including data access, exchange, and integration. Leveraging frequently implemented functionality in predefined Quick Process Action Components (QPACs), designers can visually implement their organization's workflows using a drag-and-drop interface. Developers can modify or create their own QPACs, enabling unlimited customization of their workflows and packaging of business rules. Since the QPACs are hot-swappable, users can change the workflow dynamically without server downtime. Business Activity Monitoring (BAM) enables the user to evaluate current workflows for potential optimization. This is particularly important in a dynamic market like the mortgage industry where partners and products change frequently.

More secure data assets

The data sets used in the mortgage industry contain personal information about borrowers, competitive product information from lenders, and asset information. As the mortgage industry becomes more diversified and distributed, it becomes more important to enable partners to protect this information throughout the mortgage lifecycle. Additionally, consumers of the information must be able to authenticate the information's origin and integrity using digital signatures whenever possible to preserve the fully electronic process. Adobe LiveCycle enterprise solutions provide security, authentication, and electronic signature services that travel with the documents, but can also be controlled from a central location.

Types of security

Data access and authorization—At the simplest level, a document can be protected by limiting access to particular functions using a document password. PDF documents support a password for opening a document and potentially another password for specific functions such as printing, form-filling, and data extraction. This solution requires users to share or distribute a password.

A document can also be protected by encrypting the contents using public key infrastructure (PKI). Encrypting the document with a key makes the document illegible to anyone who does not decrypt it with a compatible key. Adobe Acrobat, Reader, and LiveCycle software include robust PKI and document rights-management support. Adobe has also teamed up with security partners to provide a full range of security capabilities.

Authentication—Digital signatures provide a unique “stamp” of a document's current state and signify that the signer approves and trusts the document's contents. Digital signatures can have different levels of trust depending on how the signature is created. A trusted third-party signature allows a user receiving a digitally signed document to verify the credentials of the signing party in a certificate repository. Digital signatures can be used both by the generator of a document and by the transaction participants to approve and authenticate a document.

Adobe LiveCycle Workflow provides the following benefits:

- Automates information capture and processing using workflow components that incorporate validation checkpoints
- Enables the dynamic implementation of user-specific business rules packages
- Reduces complicated, hybrid processes requiring redundant, paper-based and digital information, as well as “wet” signatures
- Automates data access, exchange, and integration into business processes through automatic document generation, auto-filling forms, and immediate document delivery
- Automates downstream process branching and exception handling
- Provides the ability for further optimization through BAM

Data integrity—Certifying a document using a digital signature allows a consumer of the document to determine if changes have been made since certification, and what those changes were.

Accountability—By capturing the document state at each signing, Adobe LiveCycle enterprise solutions enable a document manager to review an authenticated audit trail of who performed certain actions and when the actions were performed.

Protecting documents with security policies

Adobe LiveCycle Policy Server software provides control of mortgage documents throughout the process by enabling security policies that travel with the document. This type of persistent security policy specifies who can access, modify, or extract information from specific documents. As a mortgage document moves through multiple organizations, a security policy controls access to confidential information, such as limiting access to a borrower's credit report to lenders or investors. Security must also be flexible, so LiveCycle Policy Server allows individuals to update security policies even after the document has been distributed. This allows the flexible transfer of documents to other organizations with confidence in the document's security regardless of where it resides.

Adobe LiveCycle enterprise software provides more security for all types of mortgage documents in numerous ways:

- Establishes flexible, document-based security policies for different individuals or organizations to provide information confidentiality
- Certifies and digitally signs documents of all types to help ensure authenticity and integrity, and to promote information reuse
- Leverages industry-standard public key infrastructure (PKI) and mortgage industry standard SISAC accreditation
- Maintains a document audit trail that details the actions taken, who initiated the actions, and when the actions occurred
- Supports all document types required for a business process (such as Microsoft Office or CAD files)
- Captures customer signatures digitally, keeping information electronic

Validating and certifying information at the source

When a mortgage document is created, the information contained in it must be validated and certified to enable confident reuse by information consumers downstream in the process. Adobe Acrobat, Reader, and Adobe LiveCycle Document Security software allow specific users or groups to digitally sign a document throughout the document's lifespan. Supporting mortgage industry-standard security and encryption regulations such as those governed by the Secure Identity Services Accreditation Corporation (SISAC) simplifies access to and authentication of protected data by industry partners. For example, a credit bureau providing a borrower's credit history can digitally sign the credit report. Now, regardless of who originally requested the credit information, authorized organizations within the workflow can authenticate the credit report and reuse the credit information with confidence.

Providing a detailed audit trail

In the lifespan of a mortgage, numerous decisions are made based on time-sensitive information provided by other individuals or groups. A lender may require a borrower to carry mortgage insurance based on the present loan-to-value (LTV) ratio during loan origination. Certification using digital signatures ensures that the current information is "locked down" at the time of signing, but what if something requires an adjustment? Because each digital signature takes a "snapshot" of the entire document state at the time of signing, changes made after the signing are stored on top of the previous data. This method of layering document changes provides a detailed audit trail of all the changes made to a document. It also enables a user to view the document state at any point in its history to determine when specific changes were made and who made them. By combining digital signatures with policy management, implementers can even create documents that both authenticate time-sensitive information and automatically make it expire on a given date and time.

Adobe LiveCycle enterprise solutions leverage existing infrastructure investments by utilizing valuable information from back-office applications and providing context-specific documents more securely. By maximizing process automation, immediate data validation, and partner authentication in a consistent and customizable document-based workflow that integrates mortgage industry standards, Adobe LiveCycle enterprise solutions provide a faster and more cost-effective way to originate, fund, and service a mortgage.

Table 1. Information providers, consumers, and maintainers

The following table identifies the major data sets used throughout the mortgage process and the respective providers, consumers, and maintainers.

Entity	Information Type												
	Information Type	Borrower Credit	Property Description	Property Appraisal	Property Demographic	Mortgage Product	Mortgage Note	Mortgage Insurance	Property Insurance	Title Insurance	Obligations (Closing)	Mortgage (Post-Closing)	Obligations (Post-Closing)
	Name, SSN, addresses, employers, salary, tax history	Credit score, foreclosure, bankruptcy, liens, delinquency, accounts, collections	Legal description, property type, property use	Property value, comparable properties	Area information, cultural concentrations, income levels	Product type, LTV	Interest rate, term, payment, prepayment	Mortgage insurance coverage	Coverage types, terms, exclusions	Coverage types, terms, exclusions	Payment schedule, fees, credits, terms, escrow information	Interest rate, LTV, unpaid balance	Principal and interest, taxes, insurance
Borrower	PP	SP				C	C				C		C
Broker			C	C		C	C				C		
Lender	C	C	C	C		PP	PP	C	C	C	C		
Credit Agency	C	PP											
Property Appraiser				PP							C		
Mortgage Insurance Provider						C	C	PP			C		
Property Insurance Provider			C	C					PP		C		
Title Insurance Provider			PP						PP	C			
Closing Agent	C		C			C	C	C	C	C	PP		
Document Custodian			C				M	M	M	M			
Servicer												PP	PP
Investor		C		C	PP	C	C	C			C	C	C

Legend
 PP = Primary Provider
 SP = Secondary Provider
 C = Consumer
 M = Maintainer

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