# An Overview of SMART Documents

Property Records Industry

Joint Task Force

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# Presented by

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# Background

Why Do We Need SMART Documents?

# Background

- Need: the ability to capture data in a trusted electronic document that reduces errors in current process
- Paradigm Change: electronic documents are the “original” and are passed downstream to other systems
- Technology: must guarantee the integrity of the data in an easily exchanged form

# Objectives

- An electronic document that binds information & presentation in a single, immutable file
- A package that is the logical “folder” of electronic documents
- Reduce the amount of human intervention (and costs) in the loan process

# Objectives, 2

- Maintain integrity and security of information … support legal and credit policy requirements
- Reuse existing technologies & standards
- Accommodate a wide range of documents, platforms, and computer systems

# Technology Needs

- Information that can be processed by software systems and have data values within narrative text
- Representation of the information that can be asked questions:
  - What kind of document is this?
  - Who are the grantors?
  - Has the document been notarized?

# Technology Needs, 2

- Information that survives changes and updates in technology
- Ability to locate relevant information
- View information in different ways and on different media: in print, as a web page
- XML is a solution…

# Technologies for SMART Documents

What is XML?

# Electronic Documents

- XML is a technology for describing information in electronic documents
- XML documents
  - carry and preserve knowledge
  - give order to information
  - have visual clues about information
- XML is eXtensible Markup Language

# Markup

- In printing, “markup” meant writing down the formatting information for the person who was setting the type

- Markup is extra information added to a document
- Markup is really everything that is in a document that isn’t the text or the content

# Markup Language

- A markup language is a set of commands for a word processor  or web browser to determine how to format the document such as “reveal codes” in WordPerfect

}\Pard\plain\s2\li270\fi-270\f1\fs36\ppscheme1 3108\lang1033 {\pntext\pard\f1\fs36 \'95\tab}{*\pn\pnlvlblt\pnf1\pnfs36\pnscheme13108{\pnt xtb \'95}}{\f1 A markup language is a set of commands for a word processor  or desktop publishing system to determine how to format a specific part of your document \par

# Separation

- XML is a Markup Language; it adds additional information to electronic documents
- XML separates the visual presentation of information from the content of the document
- With other technologies for electronic documents  this is not true; format and content are intermixed

# Representing Structure

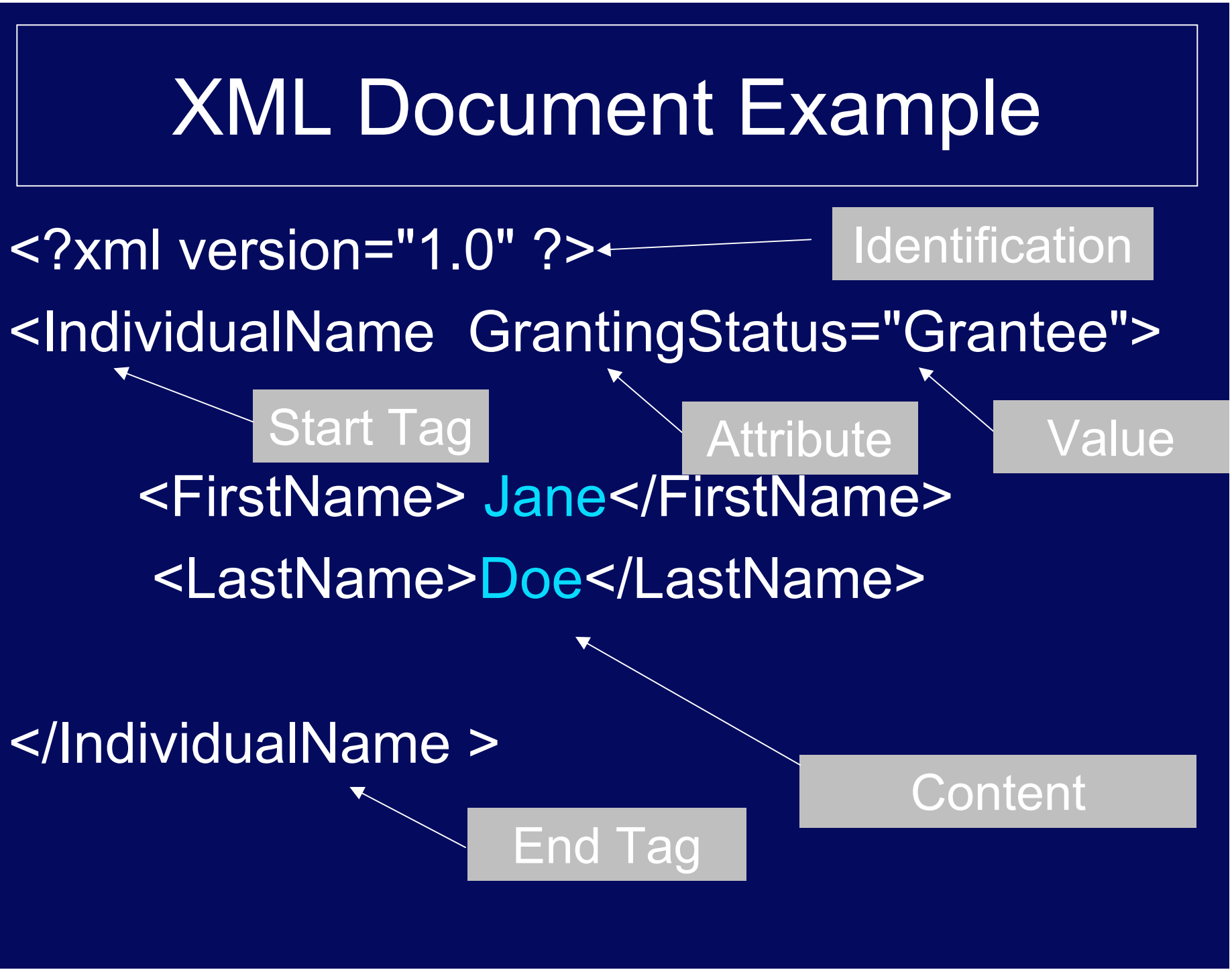
- XML allows for the natural structures or classifications to be added to the information content
- The structures which are implicit can be explicitly represented in XML
- Any structure can be represented in XML:

```
<IndividualName GrantingStatus="Grantee">
        <First>Rachael</First>
        <Last>Sokolowski</Last>
</IndividualName>
```

# XML

- Communicates information  to humans in a way that can be understood and read
- Communicates information to a computer so that a variety of applications including those of the future can use the information
- Facilitates the using the same information source to produce different forms: print, web, databases
- Allows for vendor-neutral interchange

# XML Document Example

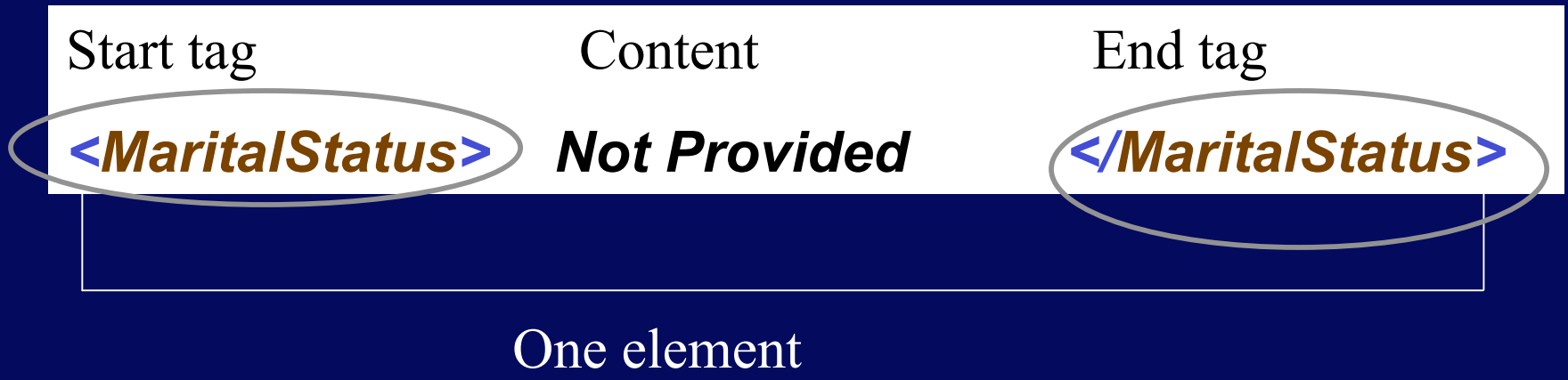


# XML Concepts

- Markup: Elements (Tags)
- Markup: Attributes (Modifiers)
- DTDs (Types of possible documents and allowable markup)
- Stylesheets (How to apply formatting)

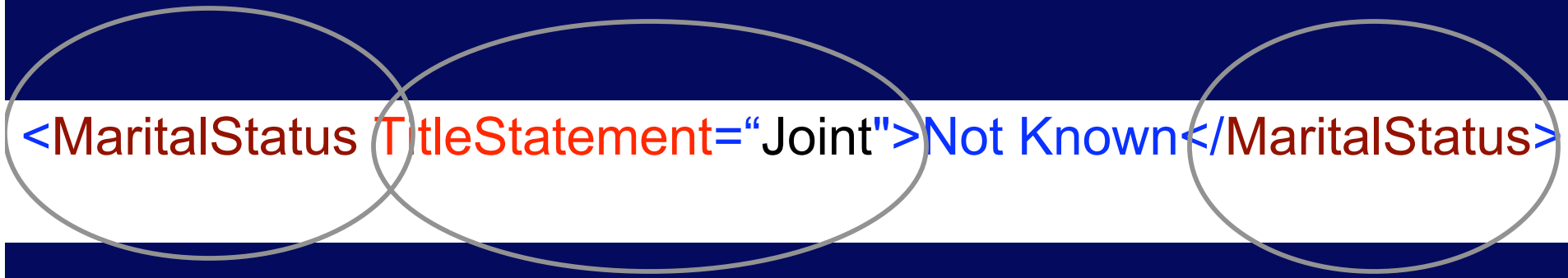
# Elements = Tags

- Elements are delimited with start “tags” and end “tags”
- Have unique names



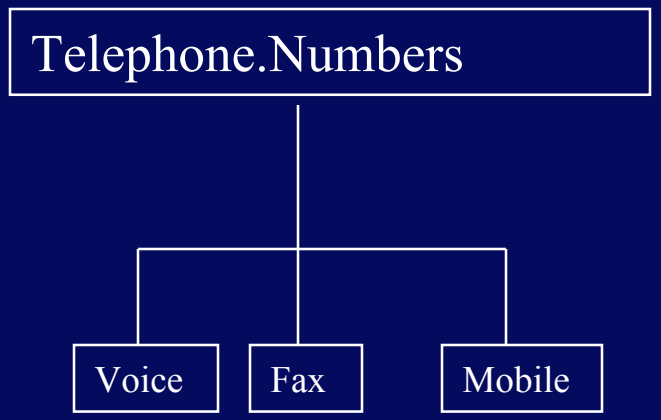
# Attribute = Modifier

Attributes immediately are specified after the element they are associated with and provide further information



# XML Represents Structure

- Classifications and hierarchies are maintained in XML markup:

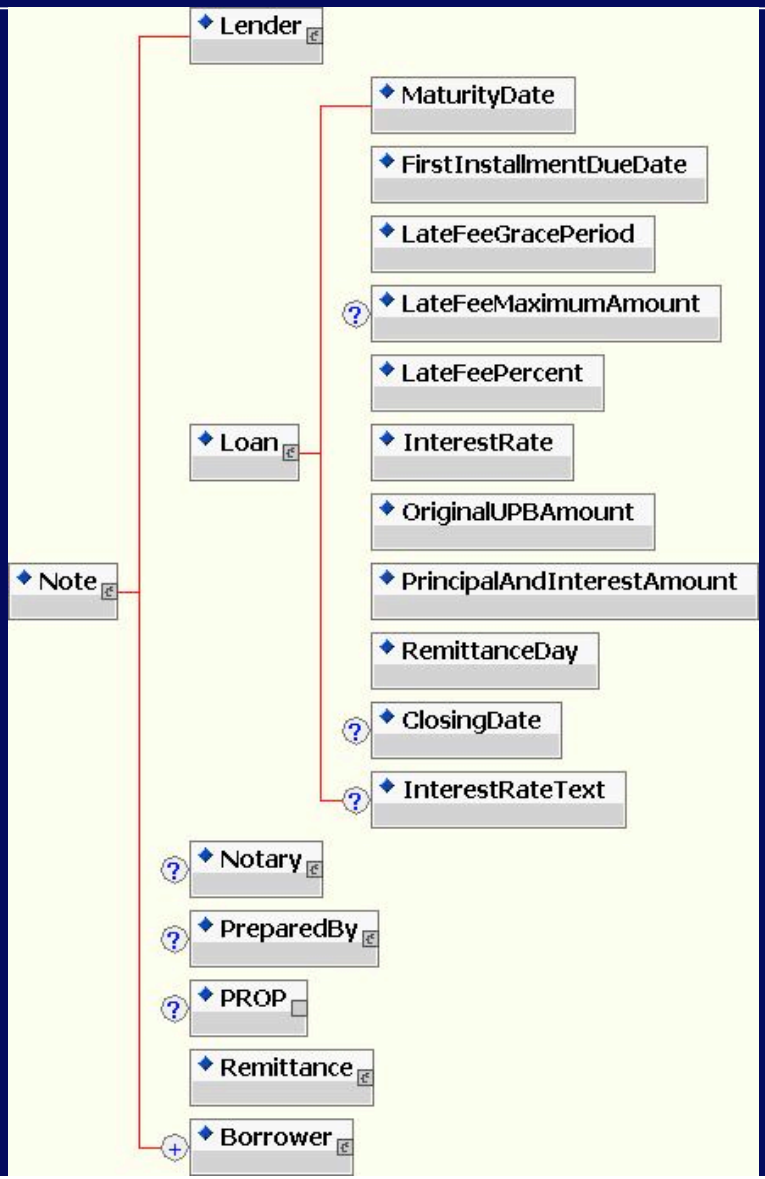



```
<Telephone.Numbers>
<Voice>781-646-8877</Voice>
<Fax>781-646-5377</Fax>
<Mobile>781-929-0182</Mobile>
</Telephone.Numbers>
```

# DTD

- Document Type Definition
- Describes the document structure
  - The names of allowable elements
  - The content of each element type
  - The structure of the document including
    - The order in which elements must appear
    - How often elements can appear
  - The properties of the elements (attributes)

# DTDs Define Structure



# Document Types

- A mortgage might have a DTD
  - Describes the mortgage
  - Defines borrowers and  a lender,
  - Provides  a legal description, etc.
- A deed may have a DTD that
  - describes the data as unique to a deed – seller, borrower, type of deed (warranty, fee simple, quit claim, etc.)

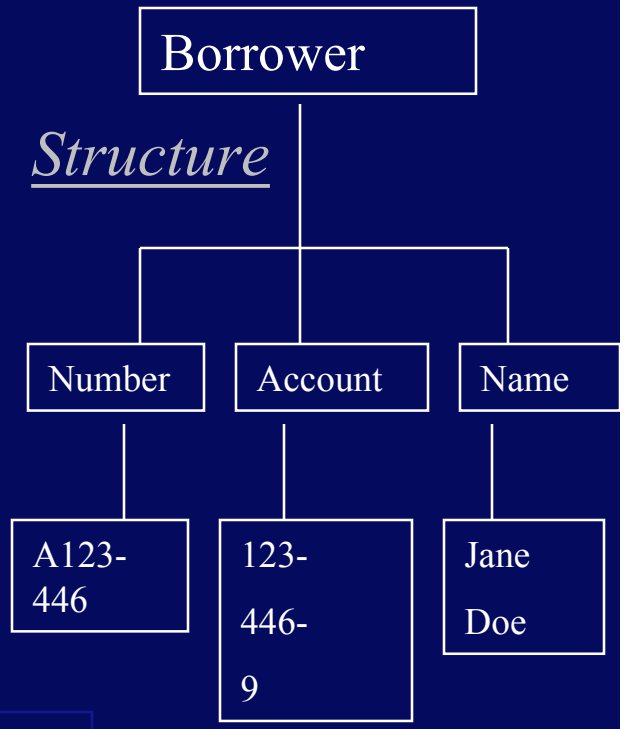
# XML DTDs are Important

- DTDs provide context for narrative text
- DTDs provide a document information model
- DTDs allow agreement on high level structures
- With DTDs, a facility for standardizing formats  can be created with stylesheets

# XML Structure & Style

*Document:*

```
<Borrower>
<Number>A123-446</Number>
<Account>123-446-9</Account>
<Name>Jane Doe</Name>
</Borrower>
```




*Stylesheet:*

Map Borrower and anything it contains to style:

Arial 10 pt Bold, Red

# XSL = Format

- eXtensible StyleSheet Language
- A standard stylesheet language for structured information
- matches styles to tags:

**Lender tag style is Times Roman Bold 24pt**

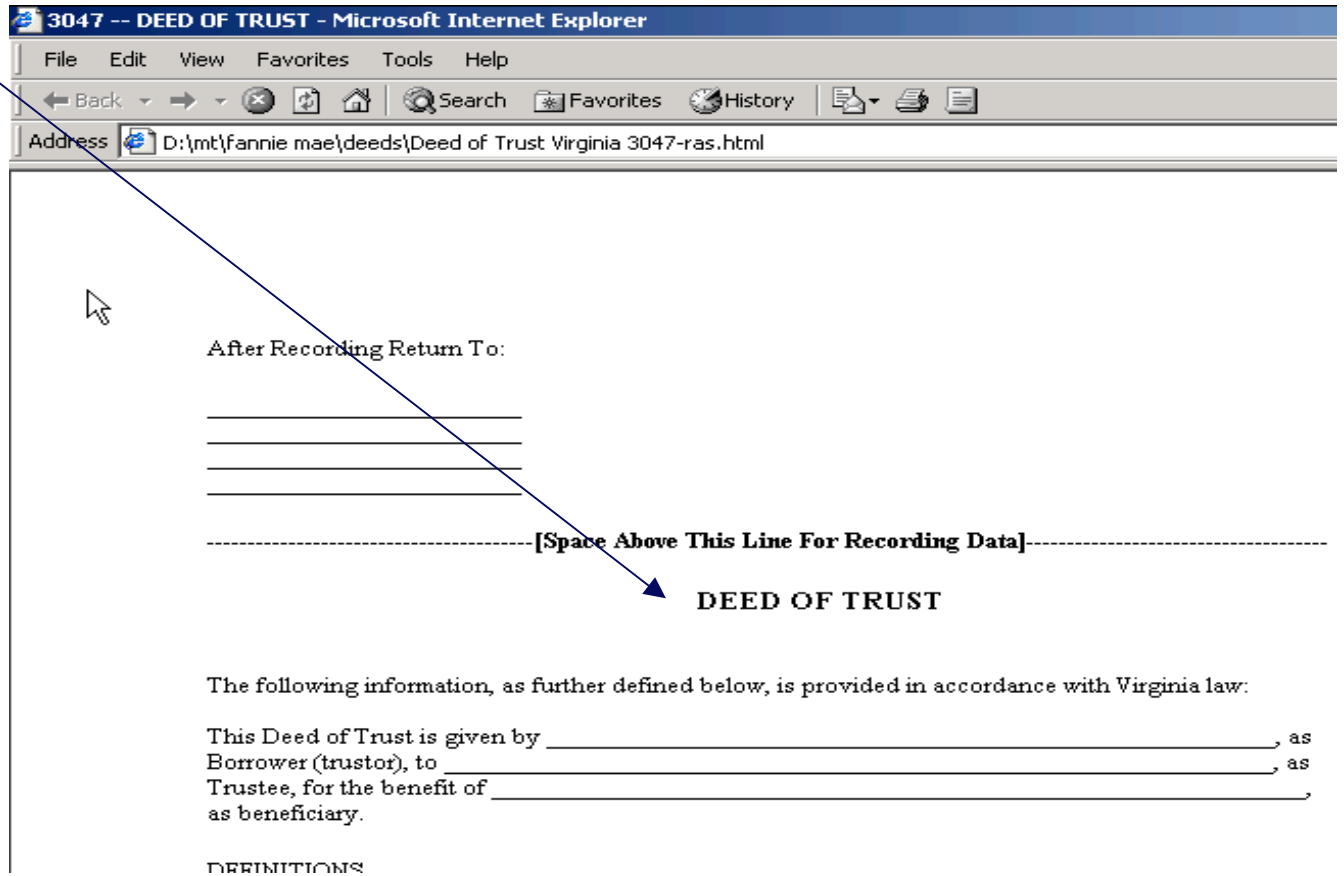
ExecutionDate style is Arial 28pt, indented 1 tab stop, red

# What is HTML

- HTML is a Mark-up Language
- HyperText Markup Language
- HTML is a mark-up language for describing web pages
- HTML contains tags that describe the format of information

# HTML Markup and View

```
<h1>DEED OF TRUST </h1><br/>
<p class="noindent">The following information, as further defined below,
  is provided in accordance with Virginia law: <br/><br/>
```



# What is XHTML?

- XHTML is a Mark-up Language
- Extensible HyperText Markup Language
- XHTML is a mark-up language for describing web pages
- XHTML contains tags that describe the format of information
- XHTML can be viewed in a browser and processed by XML soft; HTML cannot

# XML & XHTML

- XML is a technology for electronic documents
- XHTML is the next generation of web pages that can be processed by XML software and web browsers
- XML accommodates a wide range of documents, platforms, and computer systems

# XML, XHTML & XSL

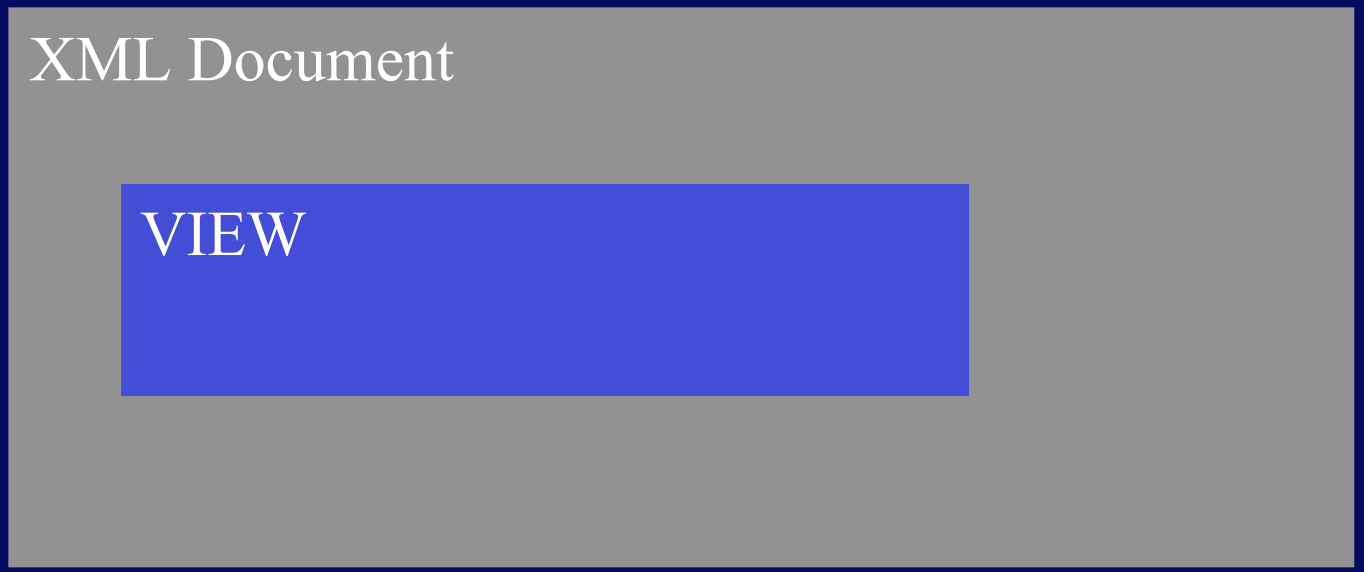
- XML “describes” the structure of information
- XHTML is the next generation of web pages that uses XML, not just browser, software
- XML + XSL generates a view, a web page of the information in XHTML

# SMART Documents

XML Design and Use

# SMART Documents

- XML Documents that contain a view in XHTML:



# SMART Documents,2

- Previously called eMortgage documents
- Any type of document that is:
  - Securable
  - Manageable
  - Archivable
  - Retrievable
  - Transferable

# Design Philosophy

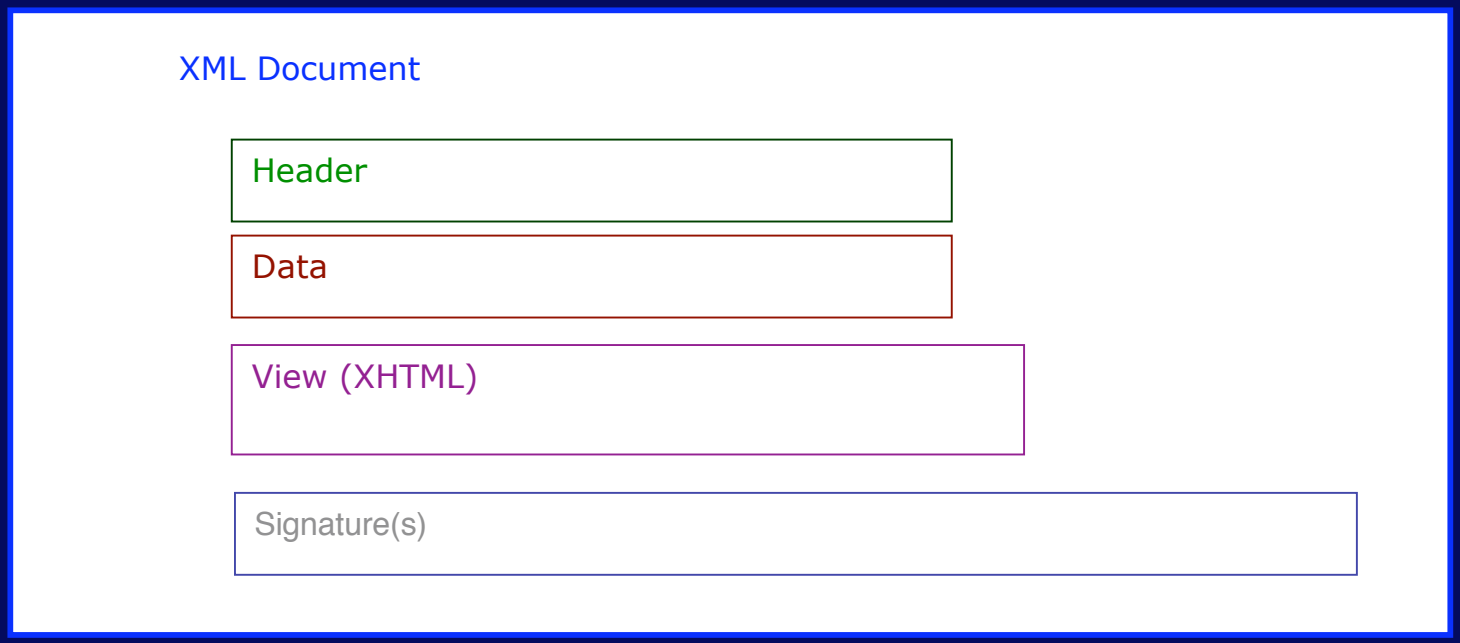
- A SMART Document contains:
  - the XML information or mortgage data
  - the view of the information
  - links between what was seen on the screen and what will be processed by computer systems
- A single file with both the data and view allows us to “trust” the electronic document as the “original”

# SMART DOC = Integrity

- What was seen on the computer screen by the person signing the document and what is used later by downstream processing systems is the same
- Conservative approach
- No legal precedent exists
- Electronic document is as valid as a paper document

# Parts of a SMART Document

- SMART Documents are XML documents
- 3 parts plus signatures that comply with ESIGN and UETA



# “Unsigned” SMART XML Document

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SMARTDOC SYSTEM "smartdoc_V1.dtd">
<SMARTDOC DocId="">
    <HEADER Id="HeaderID">
1       <!-- Information about the document .. its type Note, Assignment and an Audit Trail -->
    </HEADER>
    <DATA Id="DataID">
        <MAIN>
 2      <!-- Mortgage Information Here -->
        </MAIN>
    </DATA>
    <VIEW Id="ViewID" MimeType="text/xml">
3       <!-- HTML view or other view such as PDF here -->
    </VIEW>
</SMARTDOC>
```

# SMARTDOC DTD

- The SMART Document specification is a DTD
- The DTD  defines the structure of the SMART Document
- The DTD defines the tags in the XML SMART Document

# HEADER

- The header contains information about the document
  - The type of the document: Note, Assignment, Deed, Timely Payment Rewards, Addenda, etc.
  - Audit Trail
  - Signature information
  - Area for tag customization

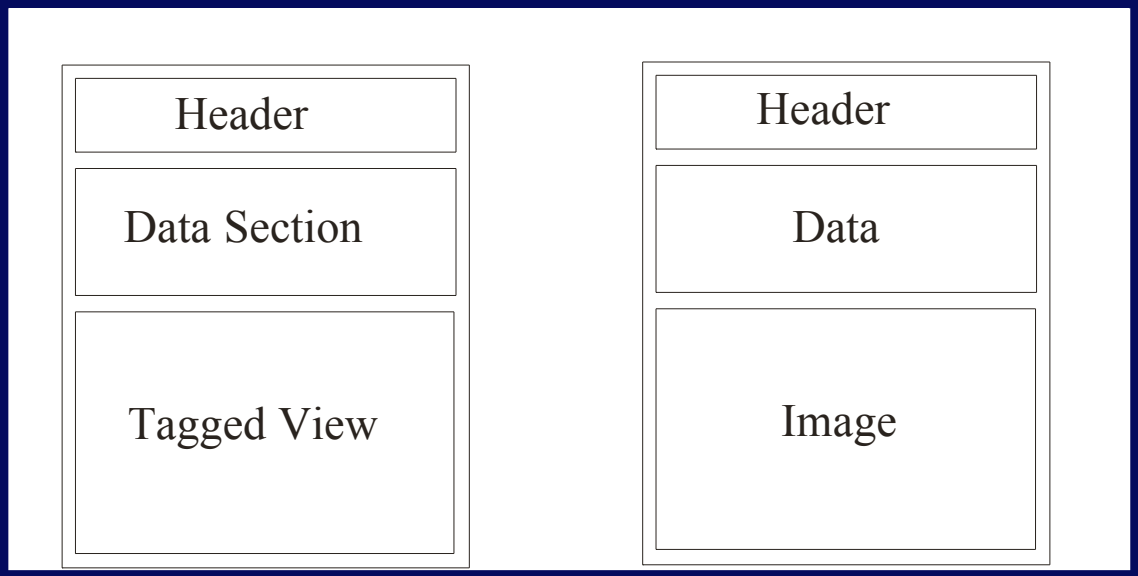
# DATA

- AUS mortgage data for all types of documents: Note, Assignment, etc.

```
<DATA> <MAIN>
   <LOAN>
    <LOAN_PRODUCT_DATA>
     <LOAN_FEATURES LoanActualClosingDay="14” LoanActualClosingYear="2001"
                    LoanActualClosingDateMonth="August"/>
     <RATE_ADJUSTMENT RateReductionForTimelyPaymentAsText="one“
                      RateReductionForTimelyPayment="1.0000“
    </LOAN_PRODUCT_DATA>
   </LOAN>
   <BORROWER _FirstName="Richard" _MiddleName="R" _LastName="Bradely"/>
   <LENDER _Name=“America National Incorporated"/>
   <EXECUTION _Month="August" _Day="14" _Year="2001"/>
  </MAIN></DATA>
```

# VIEW

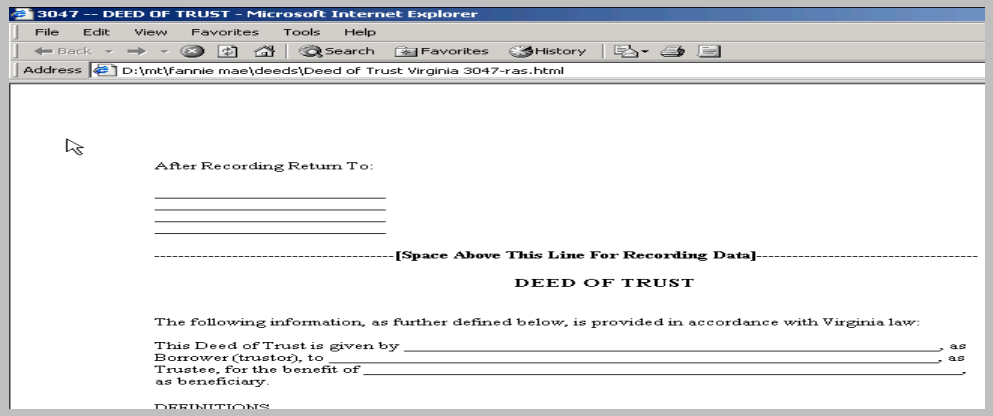
- 2 types of views: tagged and image
- A tagged view is XHTML
- An image view is an electronic representation of a paper document (pdf, jpg, tiff etc.)



# XHTML View

## SMART XML DOCUMENT

```
<SMARTDOC DocId="DocumentID" Version="1.0">
        <HEADER Id="HeaderID"><!-- Header Information Here --></HEADER>
        <DATA Id="DataID"><!-- Deed Data --></DATA>
        <VIEW Id="View01" MimeType="text/xml" Tagged="True">
```

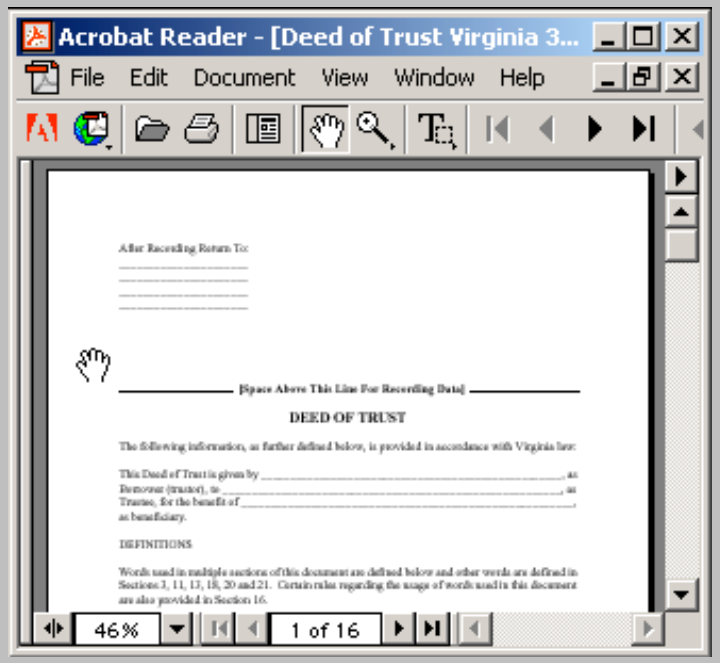



```
        </VIEW>
        <SIGNATURES>    <!-- Signatures here --></SIGNATURES>
</SMARTDOC>
```

# Image View

SMART XML DOCUMENT

```
<SMARTDOC DocId="DocumentID" Version="1.0">
        <HEADER Id="HeaderID"><!-- Header Information Here --></HEADER>
        <VIEW Id="View01" Href="deed.pdf" MimeType="application/pdf"
              Tagged="False">
```




```
        </VIEW>
        <SIGNATURES><!-- Signatures here --></SIGNATURES>
</SMARTDOC>
```

# Linking the Data and View

```
<LOAN>
 <MORTGAGE_TERMS InterestRatePercent="6" LoanAmount="150,000.00"/>
</LOAN>
<MAP Target="sampleView3200">
  <ARC DataEnd="LOAN/MORTGAGE_TERMS/@InterestRatePercent"
       ViewEnd="id(InterestRatePercent)"/>
 </MAP>
```

1

2

```
<h2>2. &amp;nbsp;&amp;nbsp; INTEREST</h2>
<p>Interest will be charged on unpaid principal until the full amount of
Principal has been paid. I will pay interest at a yearly rate of      <span class="underlinedata"
id="InterestRatePercent">6</span> %. <br />
</p>
```

3

**1. BORROWER'S PROMISE TO PAY**

In return for a loan that I have received, I promise to pay U.S. $150,000.00 (this amount is called "Principal"), plus interest, to the order of the Lender. The Lender is Seventh National. I will make all payments under this Note in the form of cash, check or money order.

I understand that the Lender may transfer this Note. The Lender or anyone who takes this Note by transfer and who is entitled to receive payments under this Note is called the "Note Holder."

**2. INTEREST**

Interest will be charged on unpaid principal until the full amount of Principal has been paid. I will pay interest at a yearly rate of 6%

# “Signed” SMART XML Document

1

2

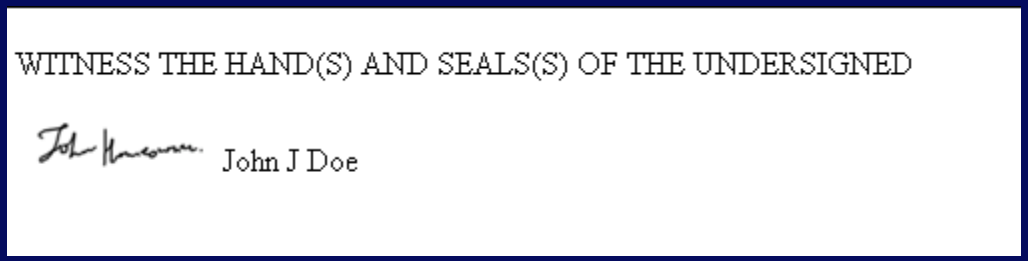
3

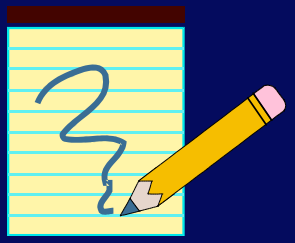
4

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SMARTDOC SYSTEM "smartdoc_V1.dtd">
<SMARTDOC DocId="DocumentID" Version="1.0">
    <HEADER Id="HeaderID">
    <!-- Header Information Here -->
    </HEADER>
    <DATA Id="DataID">
    <!-- Loan Data -->
    </DATA>
    <VIEW Id="View01" MimeType="text/xml" Tagged="True">
    <!-- What was viewed on the computer screen here -->
    </VIEW>
    <SIGNATURES>
    <!-- Signatures here -->
    </SIGNATURES>
</SMARTDOC>
```

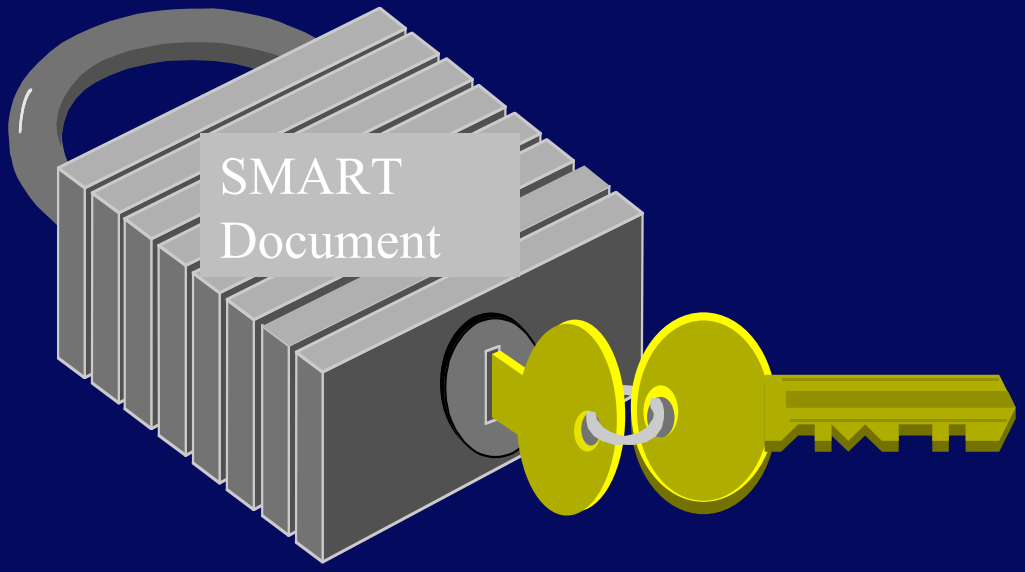
# Signatures

- There are two categories of signatures
  - Those that represent signature lines



  - Those that act as a tamperseal



# Electronic Signatures

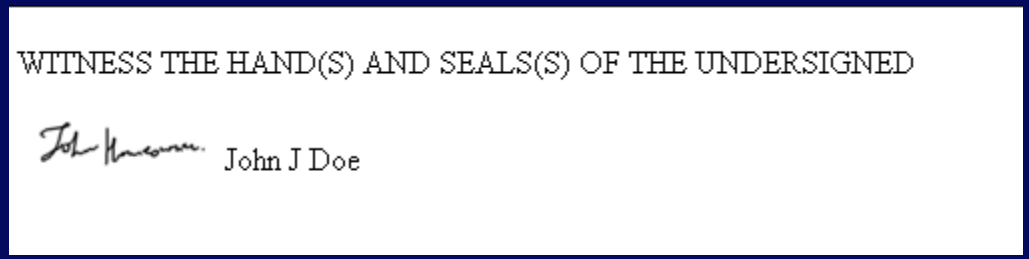
- Signatures that represent signature lines on paper
- Electronic signatures may be
  - text

WITNESS THE HAND(S) AND SEALS(S) OF THE UNDERSIGNED

Borrower 1 Electronically signed by John J Doe on 12/17/2001 15:53:06 PST John J Doe

Borrower 2 Electronically signed by Jane J Doe on 12/17/2001 15:53:56 PST Jane J Doe

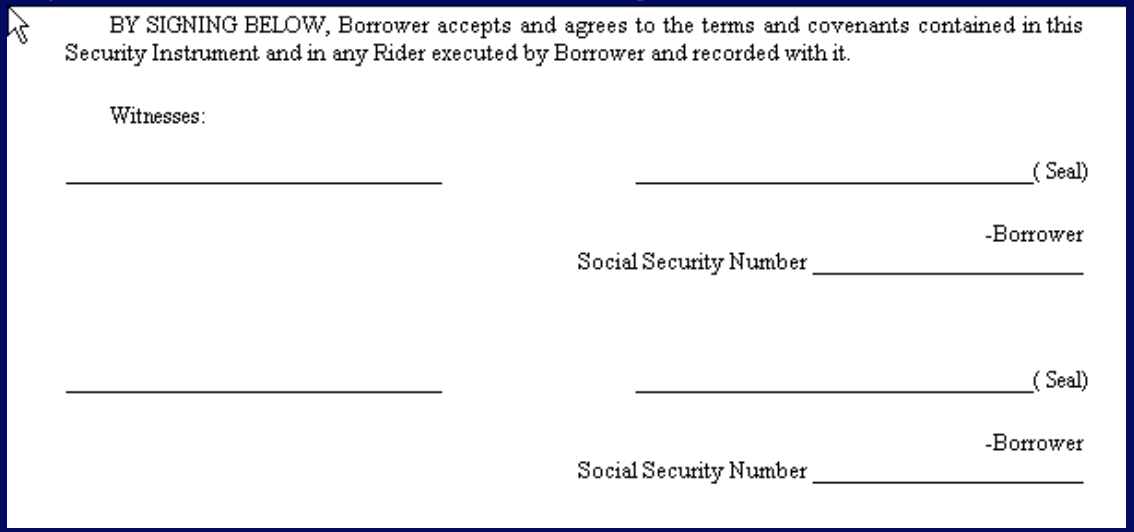
  - an image




  - software code that represents the signature

# Digital Signatures

- Conform to the W3C XML Signature Recommendation
- Act as a tamperseal
- May be used for signature lines as well



BY SIGNING BELOW, Borrower accepts and agrees to the terms and covenants contained in this Security Instrument and in any Rider executed by Borrower and recorded with it.

Witnesses:

_____ _____ ( Seal)

-Borrower

Social Security Number _____

_____ _____ ( Seal)

-Borrower

Social Security Number _____

# Conclusion

- The SMART DOCUMENT:
  - Simplicity - strives to be as simple as possible and easy to implement
  - Reuse - reuses existing MISMO & W3C standards
  - Flexibility - allows for variability in the structure, signature models, and presentation formats
  - Security - requires explicit intra-document links for foolproof validation between the data and the view

# Conclusion

<Thank-you>

for your attention

</Thank-you>

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