

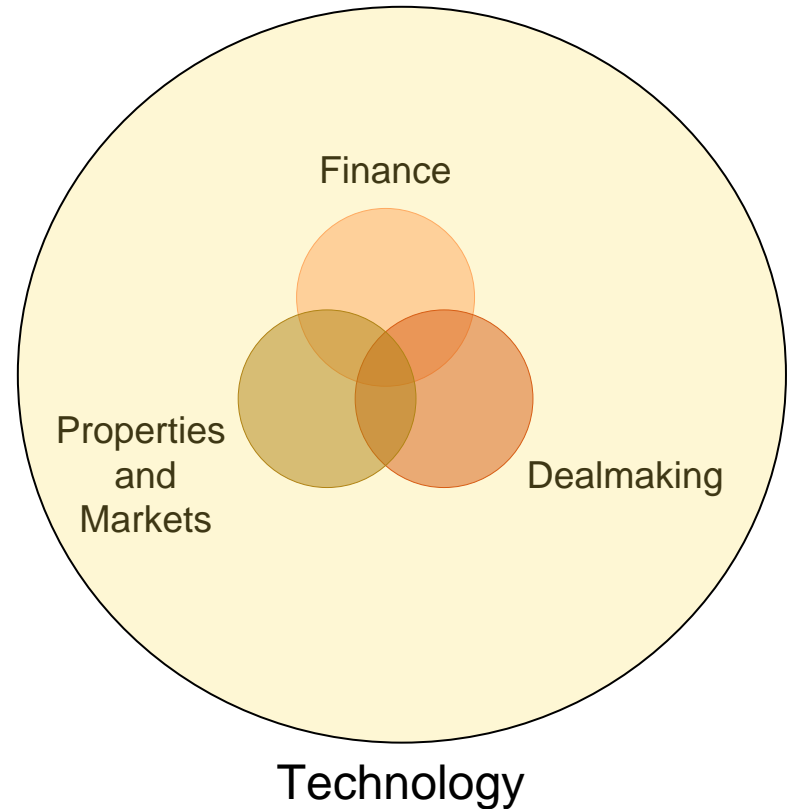
Technology Overview and Updates

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Technology in the Mortgage Industry

- The business of mortgage lending relies on the applied and professional application of several different skill sets
 - » Financial acumen
 - » Property, market, and economic analysis
 - » Interpersonal and soft skills
- These are all impacted by technology



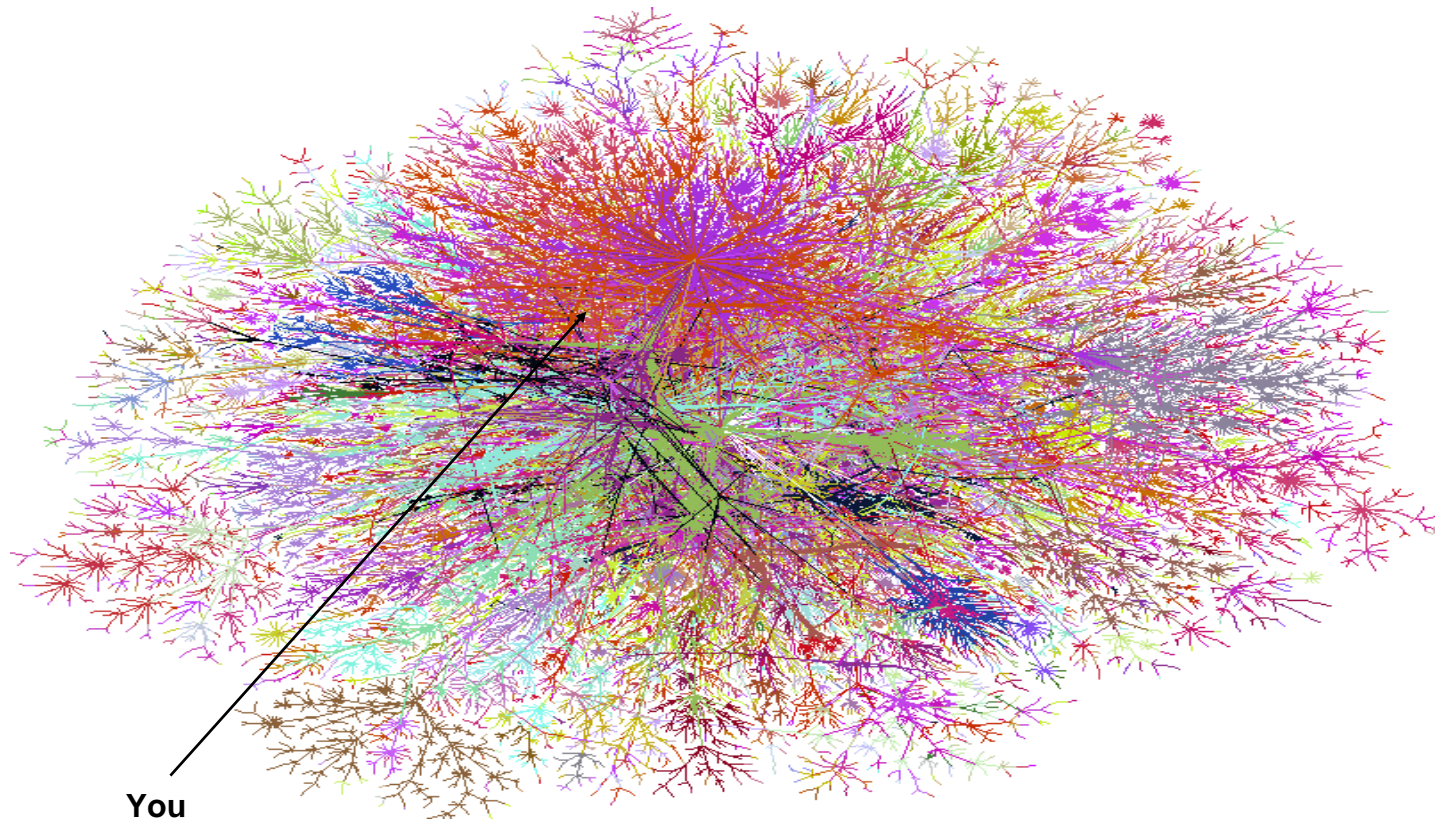
Technology Trends

The trajectory of innovation – particularly over the last 10 years – can be seen in the description of three key themes:

- Interconnectivity
- Processing Power and Storage
- Convergence

Technology Trends - Interconnectivity

- The Internet

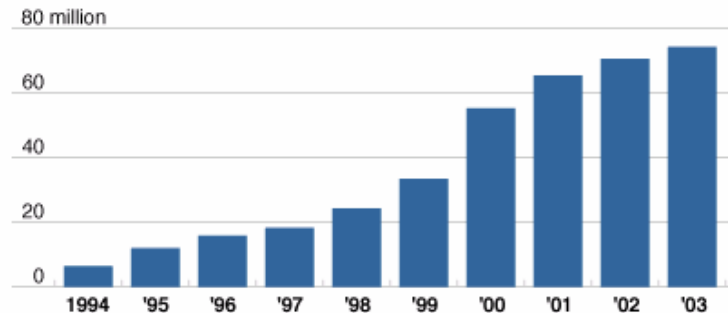


Source: *Wired Magazine*

Technology Trends - Interconnectivity

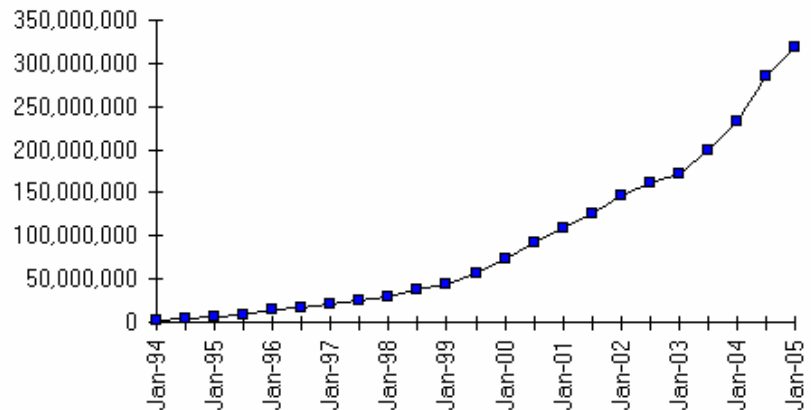
- The Internet is 36 years old
- The World Wide Web is 16 years old
- eBay is 12 years old
- Over 70 billion e-mails (estimated) are sent each day
- Over 100 million websites are now registered

Online U.S. Households



Source: Yankee Group. Numbers do not include businesses and are on a household basis.

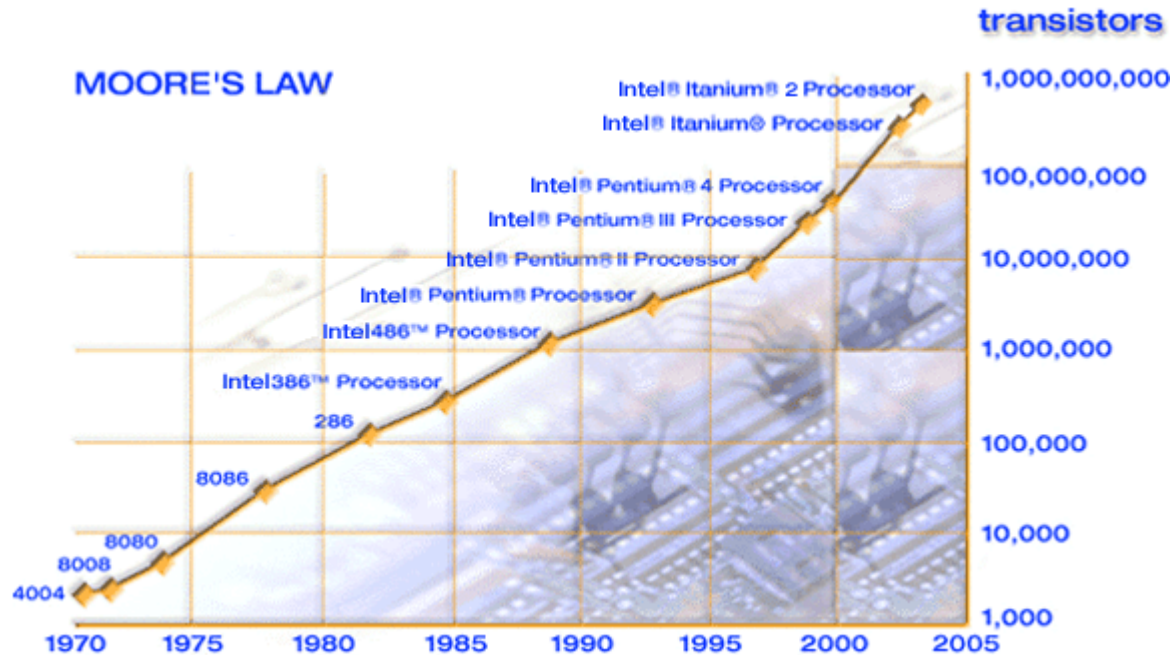
Internet Domain Survey Host Count



Source: Internet Software Consortium (www.isc.org)

Technology Trends – Processing Power

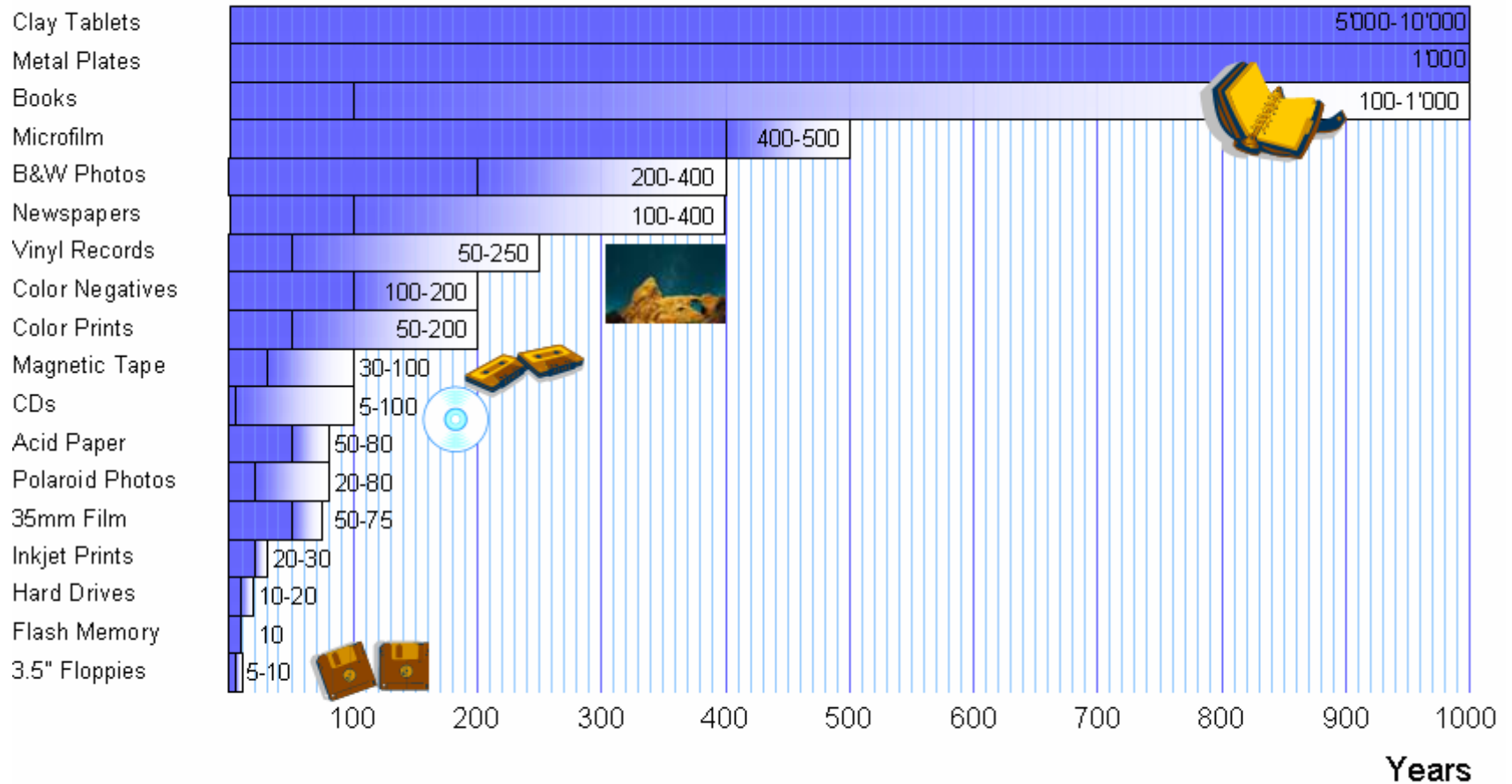
- Moore's Law – the definitive measure of computing power



Source: Intel Corp

Technology Innovation and New Risk Control Requirements

Data storage isn't what it used to be...



Source: Wired June 2002, p 062

Technology Trends – Convergence

- Convergence is the evolution of multiple technologies onto a single platform



- The implication is clear – we are heading into a period of constant connectivity

Technology in the Mortgage Industry

- Technology and innovation in the mortgage are intertwined
- There are clear distinctions between market-driven innovations and industry-driven innovations
- Market-driven innovation – the better mouse trap
- Industry-driven innovation – the rising tide that lifts all boats
- MBA is the center of activity for industry-driven innovation

Horizontal Standards

- TCP/IP, FTP, HTTP, WiFi, Bluetooth
 - » Network and communication transport
- XML (Extensible Markup Language)
 - » Data transactions over the internet
- HTML (HyperText Markup Language)
 - » Web page design and formatting for browsers
- PDF® (Portable Document Format)
 - » Universal multi-platform document format
- TIFF® (Tagged Image File Format)
 - » Universal image file format (think: fax machines)

XML: Extensible Markup Language

- Text-based, human-readable
- Open/Close tags identify each field as data
- *Example:*
<BorrowerFirstName>Harry</BorrowerFirstName>
- Defines rules for tagging data
 - » Create custom transactions
 - » Use pre-defined standard transactions
 - » Extend standard transactions with custom data, without “breaking” them
- Open standard for data transfer via the Internet

Important XML Concepts

- DTD (Document Type Definition) and Schema
 - » Both define XML transaction structures
 - » Schema is more recent and more advanced and allow strong data typing
- Namespaces
 - » Key to XML data extensions – prevents custom data from different organizations from interfering
- XSL / XSLT (XML Stylesheet Language and XSL Transformation)
 - » Powerful tools to transform raw XML data into structured output, or into other data formats
 - » Common data pool can be transformed into multiple formats – web pages, PDAs, printable versions, or a data transaction to a business partner

HTML: HyperText Markup Language

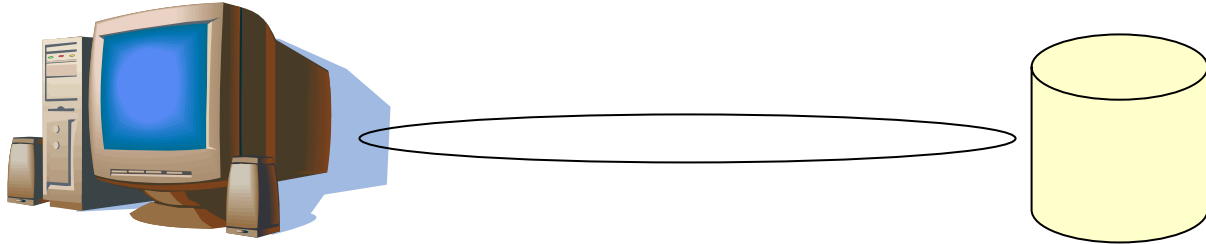
- The standard for web page formatting
- Combines both content (page text) and formatting codes (bold, heading, bullets) in a single file
 - » *This makes website maintenance more difficult*
- Web browsers interpret the text and formatting codes to display web pages

Key Types of Technologies

- Client/Server
- Web Services
- Document Imaging
- MBA Technology Initiatives
 - » MISMO (XML Data)
 - » eMortgage
 - » SISAC (Security)

Client/Server Technology

Thick Client



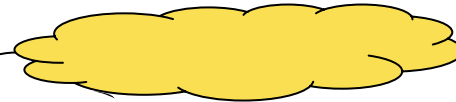
Requires full workstation
Application installed locally

Connects to back-end database,
usually over a local area network

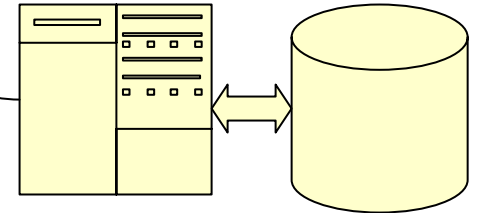
Thin Client



Runs in browser



Connects over
internet or wide-area
network technology



Application server
and database are
centralized

Web Services

- Web-based application server provides specific services, upon request from remote servers
- Allows your website or web application to provide services without developing them all internally (ie, a mortgage rate calculator)
- Uses XML-based request/response
- Advanced technologies:
 - » SOA: Services Oriented Architecture
 - » AJAX: Asynchronous Javascript and XML
 - » LAMP: Linux, Apache, MySQL, PHP

Document Imaging

- Scan paper documents into central server using high-speed sheet-fed scanners
- Users can view page images on demand at their desktops, rather than search for paper copies
- System performs OCR (optical character recognition) and full-text indexing as docs are scanned in
- Zone OCR: Converts a specific area of page into text for key index field (ie, loan number in top right corner)
- Customizable keyword indexes
- Search docs using keywords, index fields, or full text

- XML Data standards for B2B transactions
- Over 5,000 data elements defined in Logical Data Dictionary (LDD)
- Covers all parts of the mortgage process from Application, Origination and Underwriting through to Secondary, Servicing, and Investor Delivery

eMortgage Technologies: eMessaging

- Request/Response architecture
- Request: “I need a Title policy, here’s the data that goes into it”
- Response: “Title policy has been created, here is the data for creating your closing package”

eMortgage Technologies: eDocuments

Templates (that change and evolve)

+ Data (from an origination system)

Electronic document

(Data/View combined for presentation)

eMortgage Technologies: eSignatures

- Electronic signatures
 - » Buyer/seller signatures
 - » Common form: signing pad at checkout
- Digital signatures
 - » Apply PKI digital certificate
 - » Can be used for the “legal” signatures required on an electronic contract, or
 - » Can be applied as tamper-evident seal to secure an electronic document
- SPeRS
 - » Standards for eSignatures, consumer disclosure/consent, and records retention

eMortgage Technologies: eRecording

- Critical piece of the eMortgage process
- PRIA developing industry standards
 - » eRecording
 - » eNotarization
- Issues:
 - » Legal framework
 - » Technology infrastructure
 - » Some requirements (ie, 100-year storage medium)
 - » Industry buy-in
 - » State-level implementation differences

eMortgage Technologies: MERS® eRegistry

- National eNote registry
- Provides ESIGN / UETA Safe Harbor compliance infrastructure for negotiable instruments
- Identifies the Controller and Location of the Authoritative Copy of the eNote

Secure Identity Services Accreditation Corporation

- Wholly-owned non-profit subsidiary of MBA
- Setting baseline industry standards for accrediting Certificate Authorities
- Goal: Interoperable PKI certificates that all meet the same baseline standards
- www.sisac.org

PKI in 60 Seconds

- PKI = Public Key Infrastructure
- Key Pairs: Each Public Key has a corresponding Private Key
- Docs encrypted with one key can be decrypted by the other key (but NOT by the same key)
- Private key stays secret, public key is... public!
 - » You send docs encrypted with your private key
 - » You receive docs encrypted with your public key
 - » Thus: secure encryption without ever revealing your private key
- Complexity behind-the-scenes: Certificate Authorities, Certificate Policies, Certificate Revocation Lists, etc

How they all fit together

How do we choose our ESIGN and UETA solutions? What should we be thinking about?

How do we know this is the real eNote?

How do we create and process eMortgage files? How is the business data defined?



How do we know which digital signatures to trust?

How do we plug all this into the County Recorder?

Questions?

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