InkML Scenarios on the Web

W3C Ink Markup Language (InkML)

Editors:
Stephen M. Watt, University of Western Ontario
Tom Underhill, Microsoft

InkML Scenario Types

- **Archival Applications**
  - **Capture ink from device and Store for later rendering, analysis, and/or searching**
- **Streaming Applications**
  - **Capture ink from device for realtime streaming to another client and/or server**
- **Streaming/Archival combinations**
  - **Stream and store simultaneously, or stream previously stored ink**

Use Cases and Scenarios

- **Ink Messaging**
  - **Two-way real time transmission of ink**
- **Ink and SMIL**
  - **Capture of ink, voice, and other modalities with synchronized playback using SMIL**
- **Ink Archiving and Retrieval**
  - **Capture of ink for later rendering, analysis, searching.**
  - **Annotation.**
- **Electronic Form-Filling**
  - **Fill out web forms using ink, authenticatable signatures**
- **Pen Input and Multimodal Systems**
  - **Capture ink and other modalities, leverage them to disambiguate communications**
- **Input Motion Capture**
  - **Touch screens, multi-touch**

Main Ideas of InkML

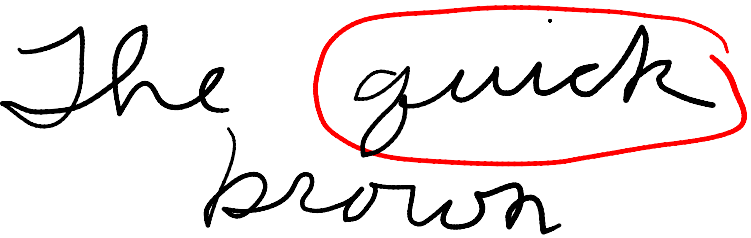
- **Traces**
  - **Sequence of points. By default (x, y) but can be more general.**
  - **Can be simple or record sufficient info for forensics or calligraphy.**
- **Grouping**
  - **By time sequence, by writer, by semantics, etc.**
- **Context information**
  - **Device information, brushes and annotations.**
- **Device independence**
  - **Transform between different device coordinate systems.**
  - **Supports digitizers, cameras, future devices.**

Ink Archiving and Analysis Scenario

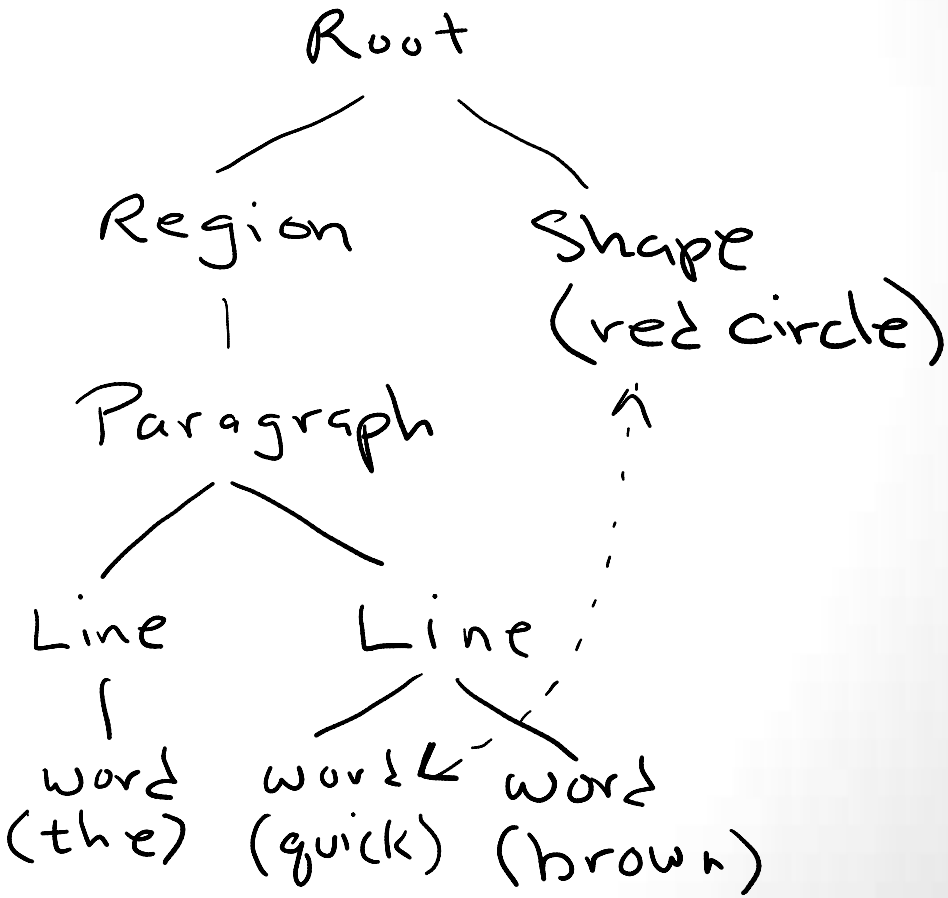
- Microsoft Office 2010
  - Ink is captured from a device and stored as InkML.
  - Product analyzes ink over time
    - (immediately after capture or after saving and reloading a file)
  - Ink is analyzed and grouped into semantic structures
    - (Diagrams, shapes, text areas, lines, paragraphs, words, math equations)

Microsoft Office 2010 Example

INPUT INK



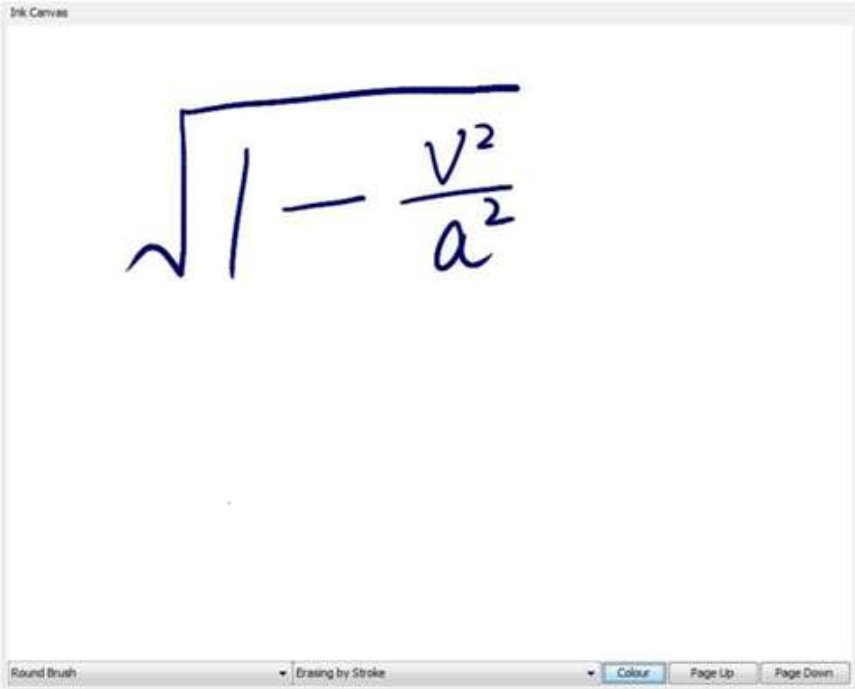
ANALYZED SEMANTIC TREE



Another example with InkML source:
http://msdn.microsoft.com/en-us/library/dd772851(v=office.12).aspx

Real Time InkML Streaming Scenario

- University of Western Ontario *InkChat* application (Skype add-on)



http://www.csd.uwo.ca/~rhu8/Research/Posters/2009-JLM-Maplesoft-poster.pdf

InkML Signature in Web Forms

- Allow user to sign web forms using digital ink
- InkML records the signature in high fidelity:
  - Variable pen force
  - Timing of creation of the individual strokes
- Benefits over a raster image
  - High quality rendering at any magnification
  - Forensic information such as force and timing can be used to validate authenticity.

InkML Signature Example

Package Number	Time Received	Received by	InkML Signature	Image Signature
123456789	October 28, 2008 8:00 a.m.	Mary T. Smith	Zoom Signature	Zoom Signature
234567890	October 28, 2008 9:00 a.m.	John Doe	Zoom Signature	
345678901	October 28, 2008 9:15 a.m.	Jane P. Jones	Zoom Signature	

Source: http://lists.w3.org/Archives/Member/w3c-archive/2008Oct/0091.html

InkML + SMIL Streaming Demo

- The following slide is a multimodal streaming example featuring inkml.
  - Application by Openstream captures camera images, voice, and Ink on a mobile device and streams them all to a server
  - The data from the server is then converted into a PowerPoint synchronized animation of the recorded voice, camera pictures and the ink strokes.
  - The timestamps which are part of the InkML spec enable this scenario


Hero
EXIT

Questions?