# Center for the Study of Digital Libraries

The mission of the Center is to foster pioneering research on the theory and application of digital libraries and to create flexible and efficient technologies for their use

# Mission

- **The Center is a member of the global digital library research community and provides a focal point for digital libraries research and technology for the state of Texas.**
- **The Center provides expertise and experience to help transfer collections of all types—from books and journals to biological specimens and museum pieces—into useful digital libraries.**
- **Digital libraries research includes projects in user interface and client software, collaborative scholarship, and information systems for storage and retrieval of materials.**

# CSDL history

- Established in 1995 by the Texas A&M University System Board of Regents
- Located within the facilities of the Computer Science Department on the TAMU main campus
- Currently the primary home to five Computer Science faculty
- Collaborations across the Texas A&M University campus and with the international research community

# CSDL faculty

- **Richard Furuta, Professor and Director of the CSDL**
- **Frank Shipman, Associate Professor and Associate Director of the CSDL**
- **John Leggett, Professor Founding Director of the CSDL**
- **Du Li, Assistant Professor**
- **Andruid Kerne, Assistant Professor**

# Center strengths

- **Known and recognized as an active participant in national and international research community**
  - **Originated Digital Libraries conference series**
  - **Editorships in leading journals**
    - **Journal of Digital Libraries editor-in-chief; TOIS, JERIC, NRHM editorial boards**
  - **Leadership roles in community**
    - **Leadership role in SIGs (SIGWEB chair; TCDL steering committee); leading international conferences (JCDL steering committee; conference chair; program chair; program committees)**
  - **Active participants in NSF DLI2 and NSDL programs**

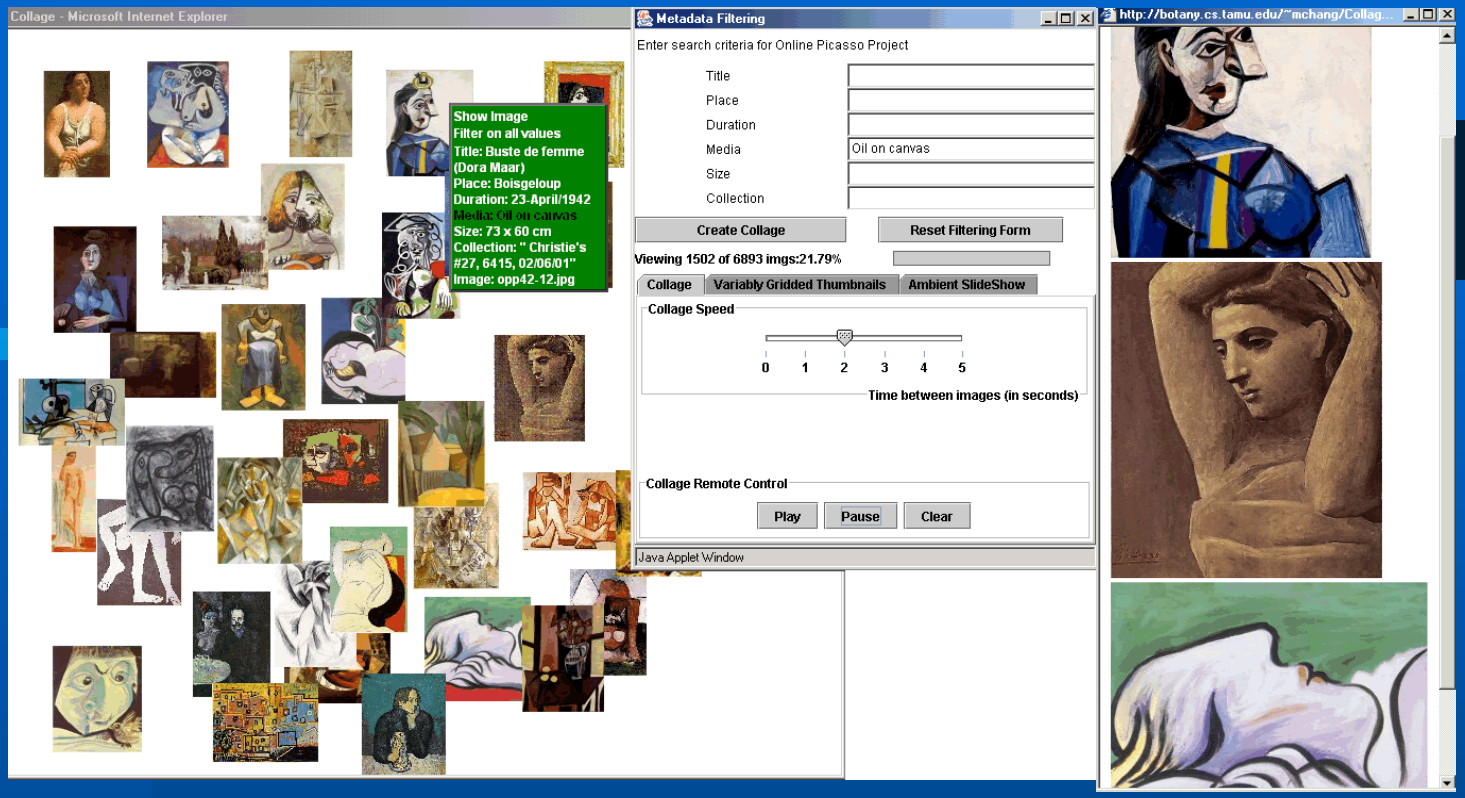
# Center strengths

- **Catalyst for broadly interdisciplinary activities on the Texas A&M University campus**
  - **Humanities informatics initiative (Engineering, Liberal arts, Libraries)**
  - **Interdisciplinary research projects across many TAMU colleges and departments**
    - **Liberal arts: Glasscock CHR, Modern and Classical Languages, Speech Communication, Psychology**
    - **Science: Botany**
    - **Agriculture and life sciences: Rangeland ecology, Entomology**
    - **Education: Educational Psychology**
    - **Architecture**
    - **TAMU Libraries**

# Research in the CSDL

# Active research environment

- **Two areas of work from the many that are active and ongoing in the CSDL**
  - **Collection Understanding (John Leggett)**
  - **Humanities Informatics (Richard Furuta, John Leggett, Frank Shipman)**




# COLLECTION UNDERSTANDING

John Leggett, Mike Ong, and Michelle Chang

Access to image collections currently relies on vague metadata descriptions or knowing metadata values. Queries return specific images that give no essence of the image collection and browsing metadata is an inflexible and pre-defined mechanism.

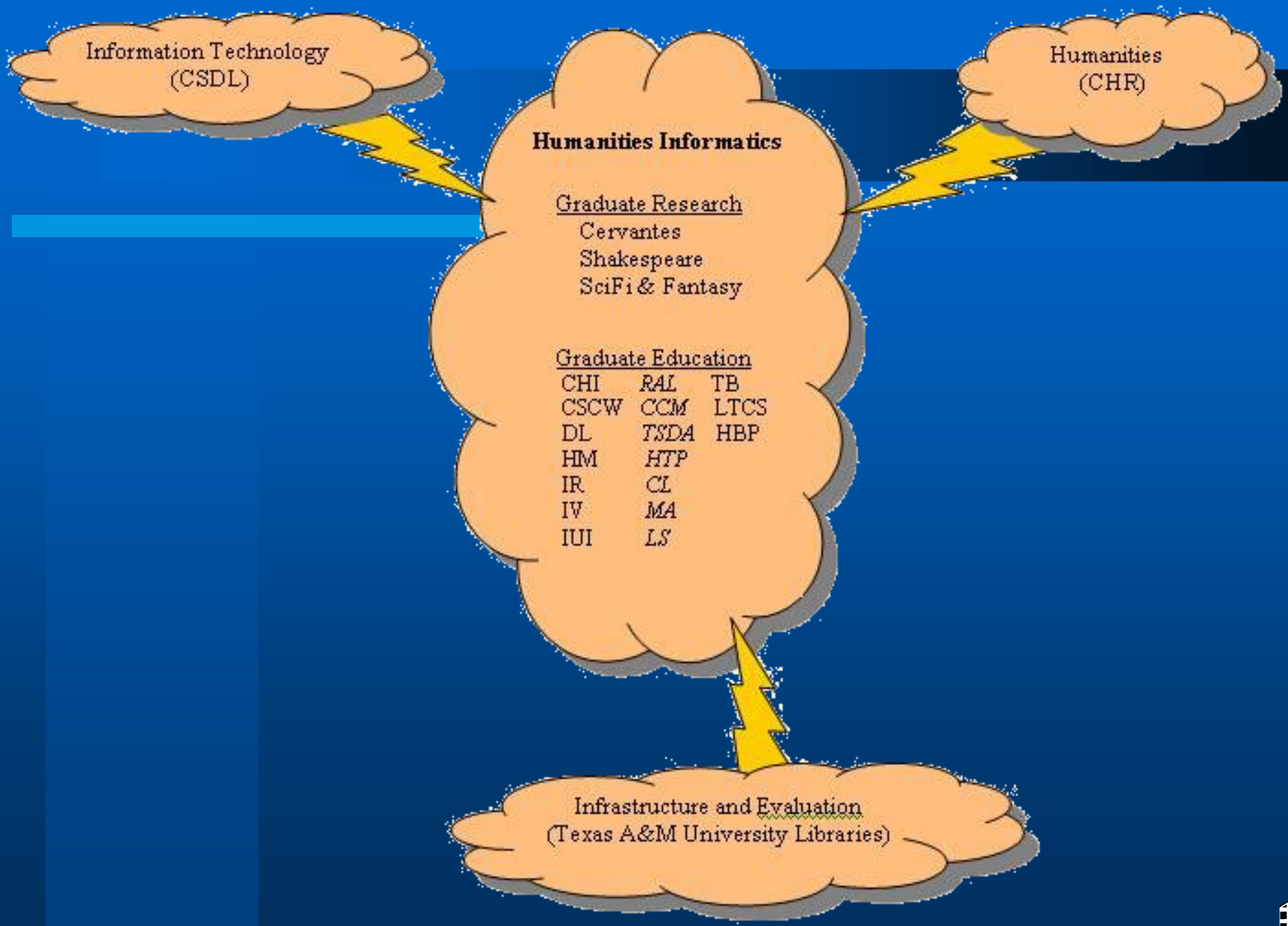
Collection understanding focuses on the artifacts of the collection and allows participants to see in the mind's eye the essence of the collection, affording derivation of novel conclusions.

# Humanities Informatics

"The application of information technology to the understanding of the human record"

# Steering committee participants

- **College of Liberal Arts**
  - James Rosenheim (History and GlasscockCHR), Eduardo Urbina (Hispanic studies), Chris Menzel (Philosophy)
  - Content and scholarly processes
  - Glasscock Center for Humanities Research
    - Fosters research on humanities scholarship
- **College of Engineering**
  - Richard Furuta, John Leggett, and Frank Shipman (all CS and CSDL)
  - Information technology and pedagogy
  - Center for the Study of Digital Libraries
    - Fosters research on theory and application of DLs
- **Texas A&M University Libraries**
  - Colleen Cook (Dean), Steven Smith (Head, Cushing Library), Martha Bedard (Associate Dean for Digital Initiatives), John Leggett (Associate Dean for Digital Initiatives Research)
  - Information infrastructure and evaluation methodologies
  - Texas A&M University Libraries
    - Ranks in top 40 of Association of Research Libraries
    - Acquires resources globally and ensures enduring access to scholarly research


Information Technology
(CSDL)
Humanities
(CHR)
Humanities Informatics
Graduate Research
Cervantes
Shakespeare
SciFi & Fantasy
Graduate Education
CHI RAL TB
CSCW CCM LTCS
DL TSDA HBP
HM HTP
IR CL
IV MA
IUI LS
Infrastructure and Evaluation
(Texas A&M University Libraries)

# Selected HI projects in the CSDL

- **Digital collection development**
  - **Cervantes Project**
  - **On-line Picasso project**
- **Information technology research**
  - **Guided paths and their maintenance**
  - **Timeline based visualizations**

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# Cervantes Project

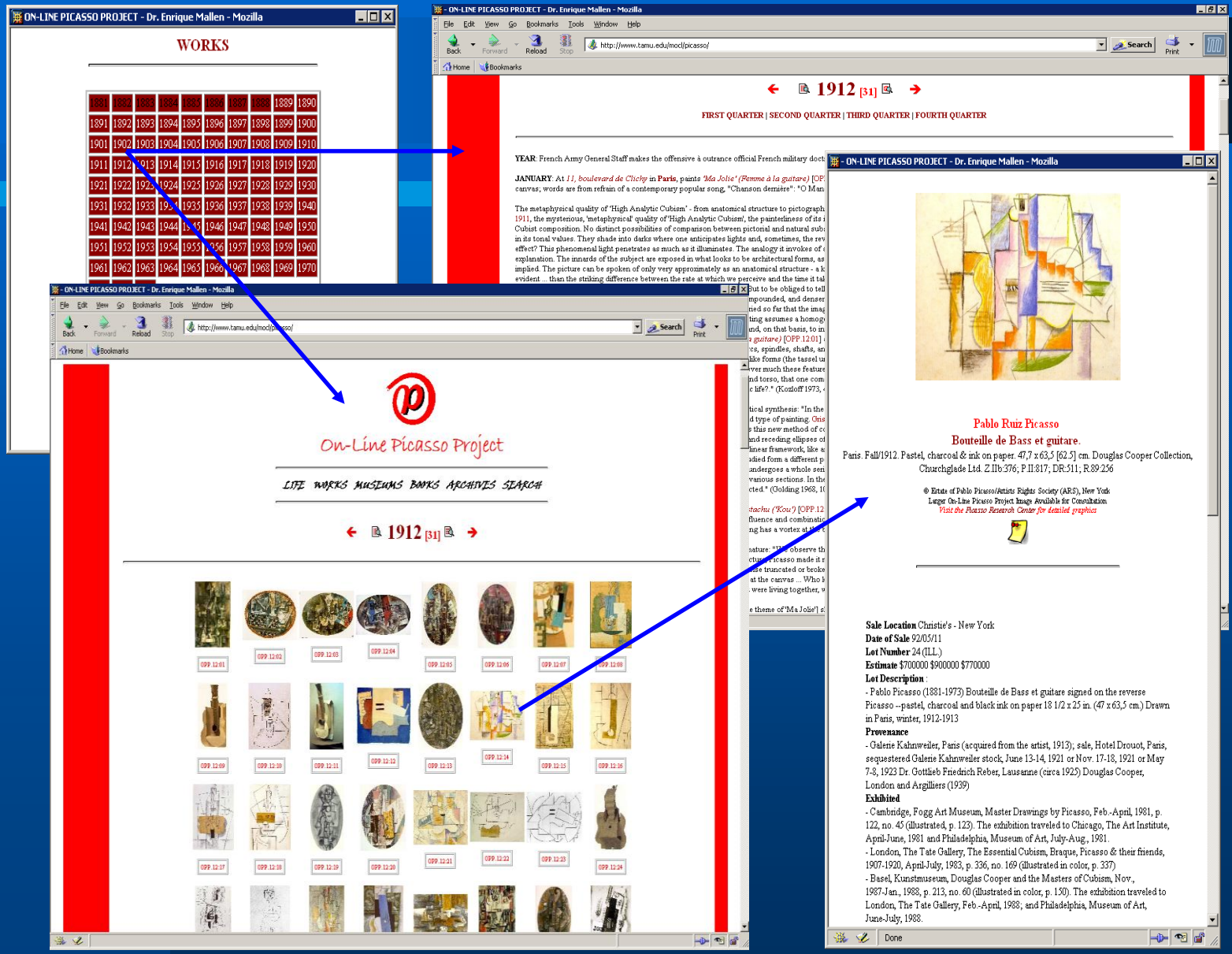
- **Comprehensive web-accessible reference and research site on life and works**
  - **Started in 1995**
  - **Three year NSF ITR grant in 2000**
- **Comprised of:**
  - **International Bibliography Online**
  - **Digital Library**
  - **Digital Archive of Images**

http://www.csdl.tamu.edu/cervantes

PIs: Eduardo Urbina (Hispanic Studies) and Richard Furuta (Computer Science)

# On-line Picasso Project

- **Digital library of artworks, biographical data and critical analysis of Pablo Picasso**
- **Over 7,000 catalogued entries**
- **Interlinked biography, exhibition notes, and commentary**
- **Areas: Information presentation/organization, personalization, culturally situated knowledge**
- **Enrique Mallen, Hispanic Studies**
- **http://www.tamu.edu/mocl/picasso**


ON-LINE PICASSO PROJECT - Dr. Enrique Mallen - Mozilla
WORKS
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http://www.tamu.edu/mocl/picasso/
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1912 [31]
FIRST QUARTER | SECOND QUARTER | THIRD QUARTER | FOURTH QUARTER
YEAR: French Army General Staff makes the offensive à outrance official French military doct
JANUARY: At 11, boulevard de Clichy in Paris, paints 'Ma Jolie' (Femme à la guitare) [OP
canvas, words are from refrain of a contemporary popular song, "Chanson dernière": "O Man
The metaphysical quality of 'High Analytic Cubism' - from anatomical structure to pictograph
1911, the mysterious, 'metaphysical' quality of 'High Analytic Cubism', the painterliness of its
Cubist composition. No distinct possibilities of comparison between pictorial and natural subs
in its tonal values. They shade into darks where one anticipates lights and, sometimes, the rev
effect? This phenomenal light penetrates as much as it illuminates. The analogy it invokes of
explanation. The innards of the subject are exposed in what looks to be architectural forms, as
implied. The picture can be spoken of only very approximately as an anatomical structure - a k
evident ... than the striking difference between the rate at which we perceive and the time it tal
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LIFE WORKS MUSEUMS BOOKS ARCHIVES SEARCH
1912 [31]
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- ON-LINE PICASSO PROJECT - Dr. Enrique Mallen - Mozilla
Pablo Ruiz Picasso
Bouteille de Bass et guitare.
Paris. Fall/1912. Pastel, charcoal & ink on paper. 47,7 x 63,5 [62.5] cm. Douglas Cooper Collection, Churchglade Ltd. Z.IIb:376; P.II:817; DR:511; R:89-256
© Estate of Pablo Picasso/Artists Rights Society (ARS), New York
Larger On-Line Picasso Project Image Available for Consultation
Visit the Picasso Research Center for detailed graphics
Sale Location Christie's - New York
Date of Sale 92/05/11
Lot Number 24 (ILL.)
Estimate $700000 $900000 $770000
Lot Description :
- Pablo Picasso (1881-1973) Bouteille de Bass et guitare signed on the reverse Picasso --pastel, charcoal and black ink on paper 18 1/2 x 25 in. (47 x 63,5 cm.) Drawn in Paris, winter, 1912-1913
Provenance
- Galerie Kahnweiler, Paris (acquired from the artist, 1913); sale, Hotel Drouot, Paris, sequestered Galerie Kahnweiler stock, June 13-14, 1921 or Nov. 17-18, 1921 or May 7-8, 1923 Dr. Gottlieb Friedrich Reber, Lausanne (circa 1925) Douglas Cooper, London and Argilliers (1939)
Exhibited
- Cambridge, Fogg Art Museum, Master Drawings by Picasso, Feb.-April, 1981, p. 122, no. 45 (illustrated, p. 123). The exhibition traveled to Chicago, The Art Institute, April-June, 1981 and Philadelphia, Museum of Art, July-Aug., 1981.
- London, The Tate Gallery, The Essential Cubism, Braque, Picasso & their friends, 1907-1920, April-July, 1983, p. 336, no. 169 (illustrated in color, p. 337)
- Basel, Kunstmuseum, Douglas Cooper and the Masters of Cubism, Nov., 1987-Jan., 1988, p. 213, no. 60 (illustrated in color, p. 150). The exhibition traveled to London, The Tate Gallery, Feb.-April, 1988; and Philadelphia, Museum of Art, June-July, 1988.
Done

# Selected HI projects in the CSDL

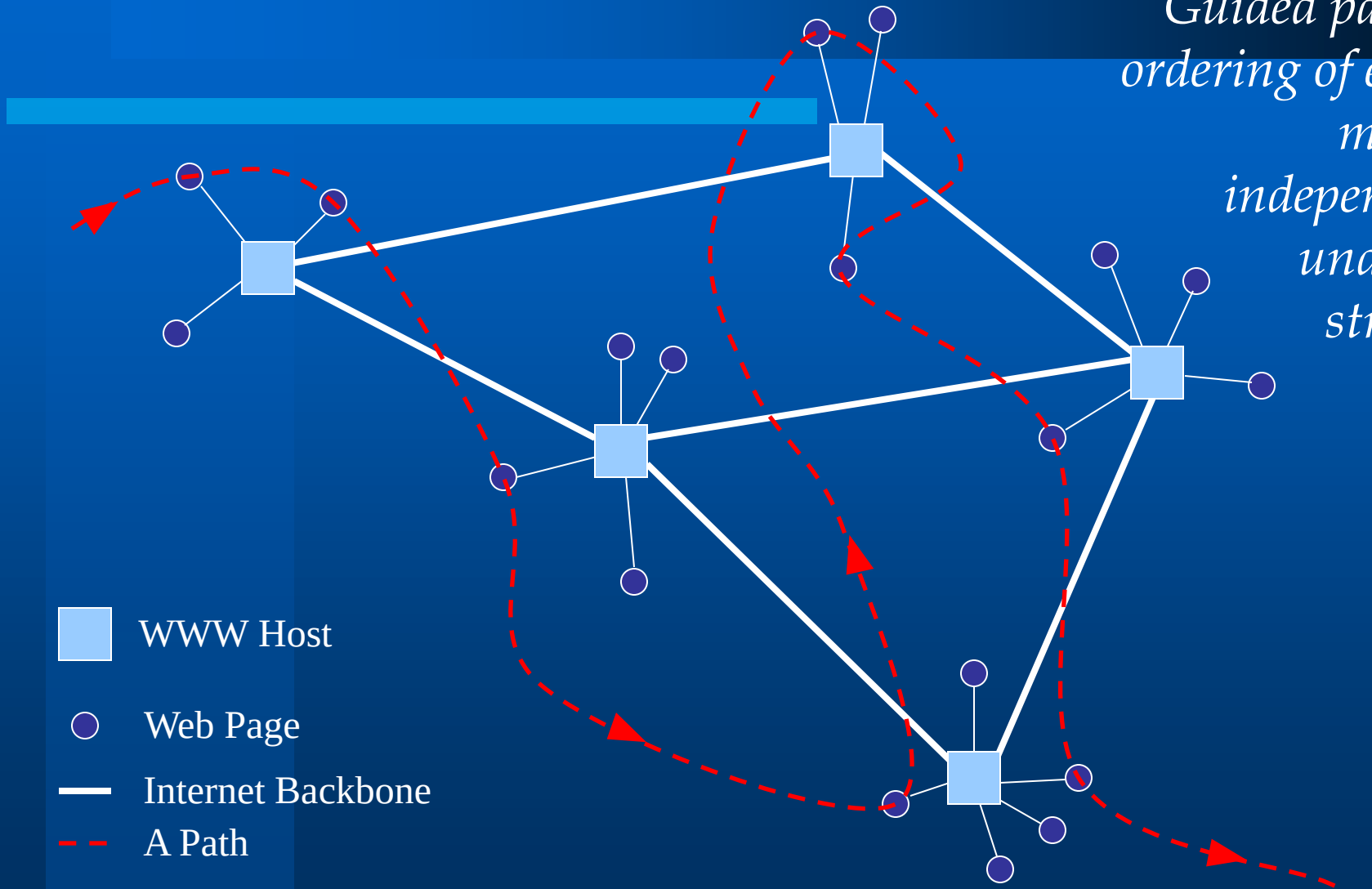
- **Digital collection development**
  - **Cervantes Project**
  - **On-line Picasso project**
- **Information technology research**
  - **Guided paths and their maintenance**
  - **Timeline based visualizations**

# Guided Paths and their Maintenance

- **Explores the applications of paths as an organizing mechanism in support of undergraduate education**
- **Explores tools that recognize problems with referenced resources in distributed digital libraries**
- **Drs. Richard Furuta and Frank Shipman**
- **http://www.csdl.tamu.edu/walden/**

# Guided paths

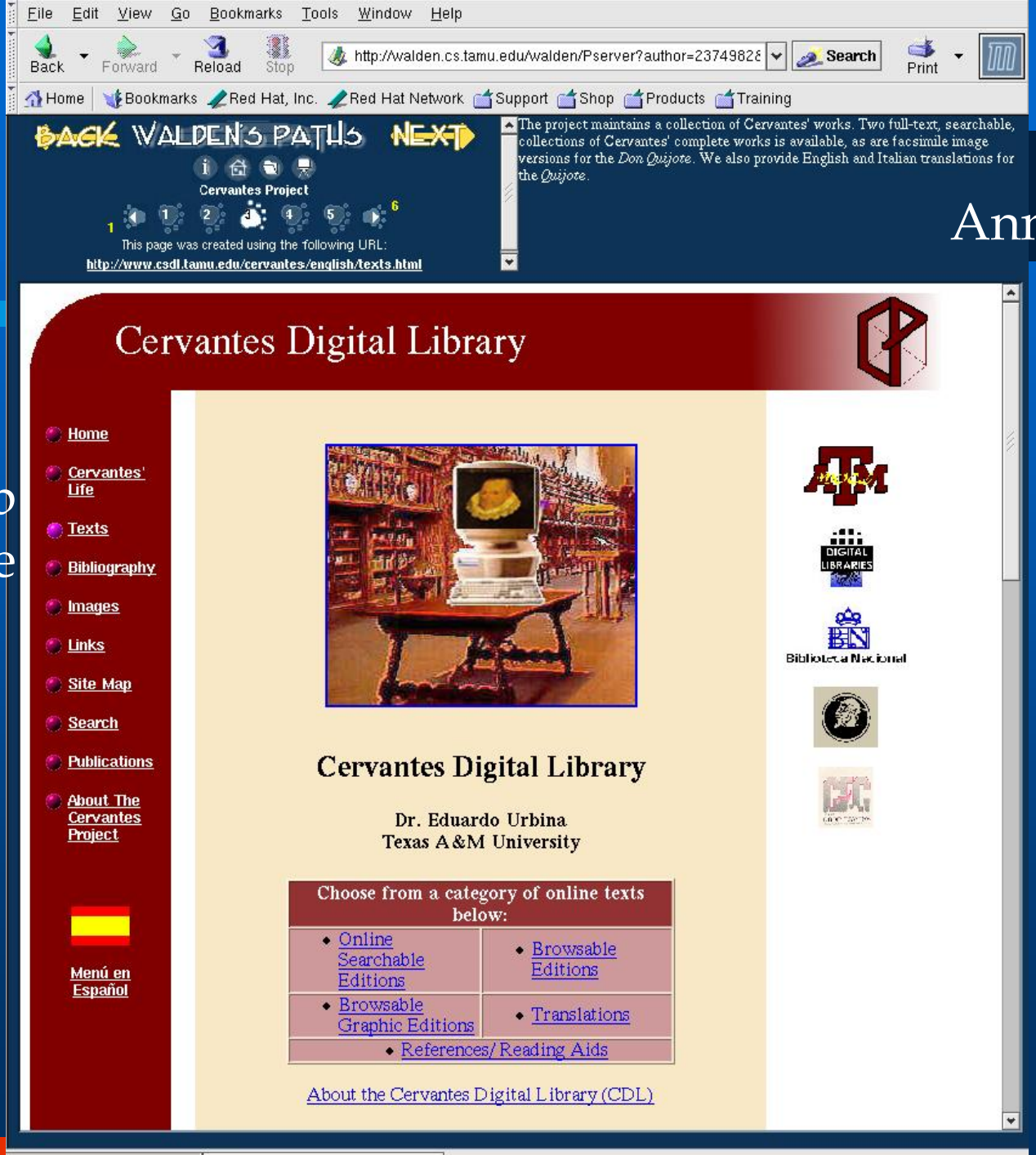
*Guided path - An ordering of existing materials independent of underlying structure.*



Controls

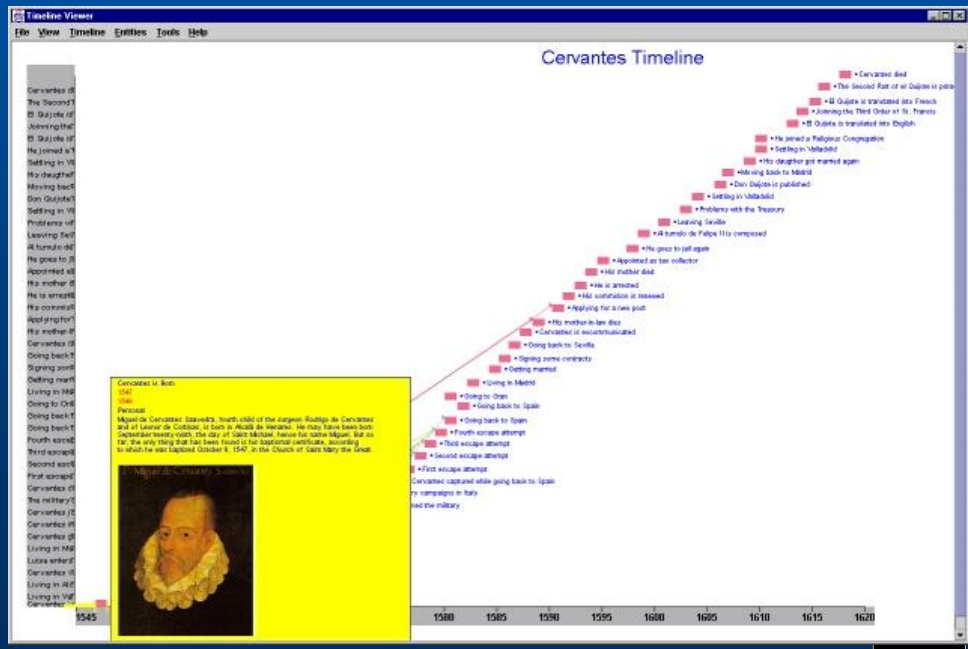
Original Web page

Annotation

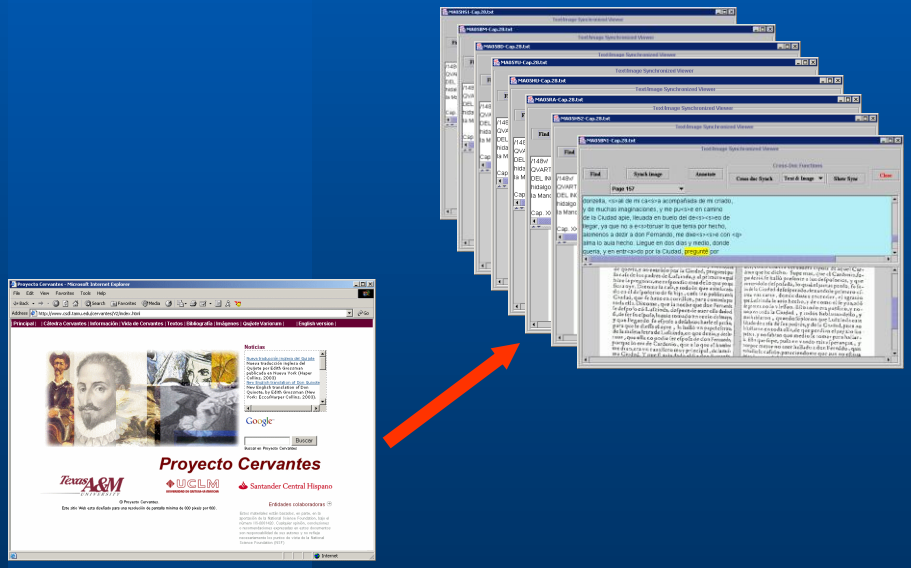


# Timeline-based visualizations

- **Interactive timeline viewer (ItLv)**
  - ItLv is a timeline-based visualization tool that enables users to explore a repository of information
  - Attributes of the metadata are depicted in an X-Y coordinates display
  - Interactive options allow further analysis of the information
  - Animated series of images can be created
  - Carlos Monroy, CSDL
    - http://www.csdl.tamu.edu/~cmonroy/itlv

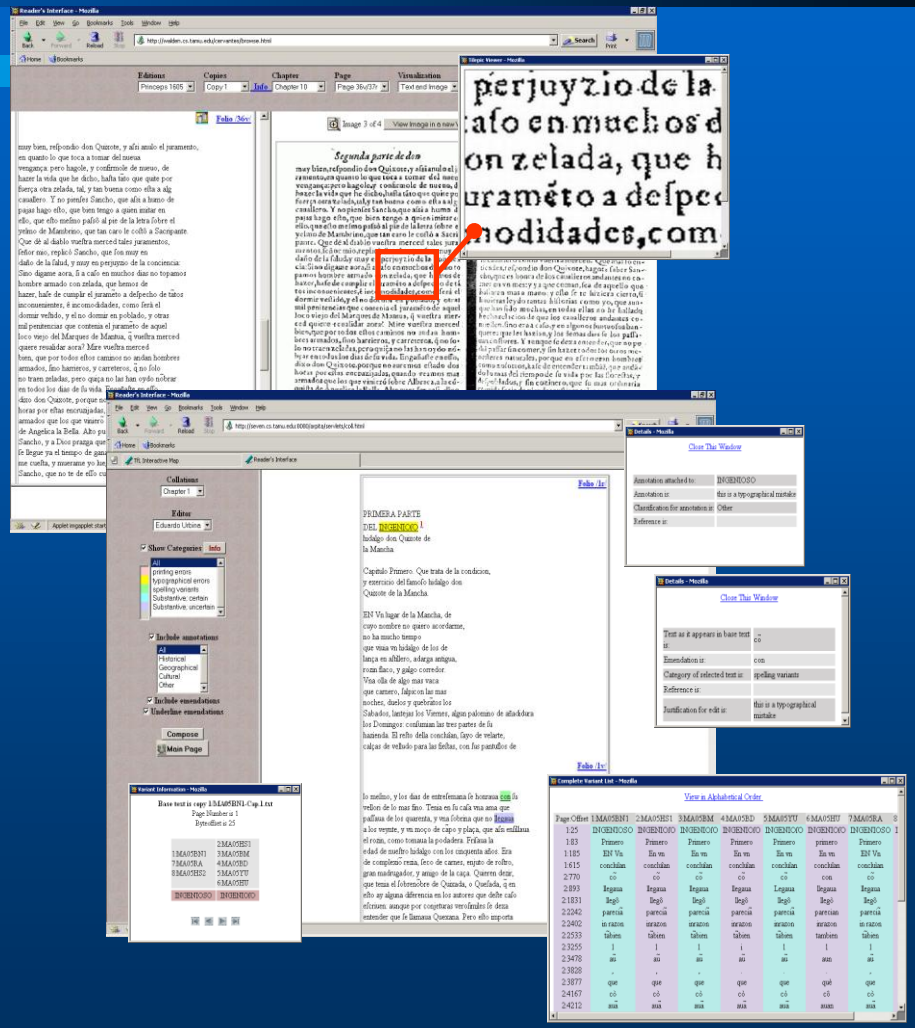


# Synergistic project development



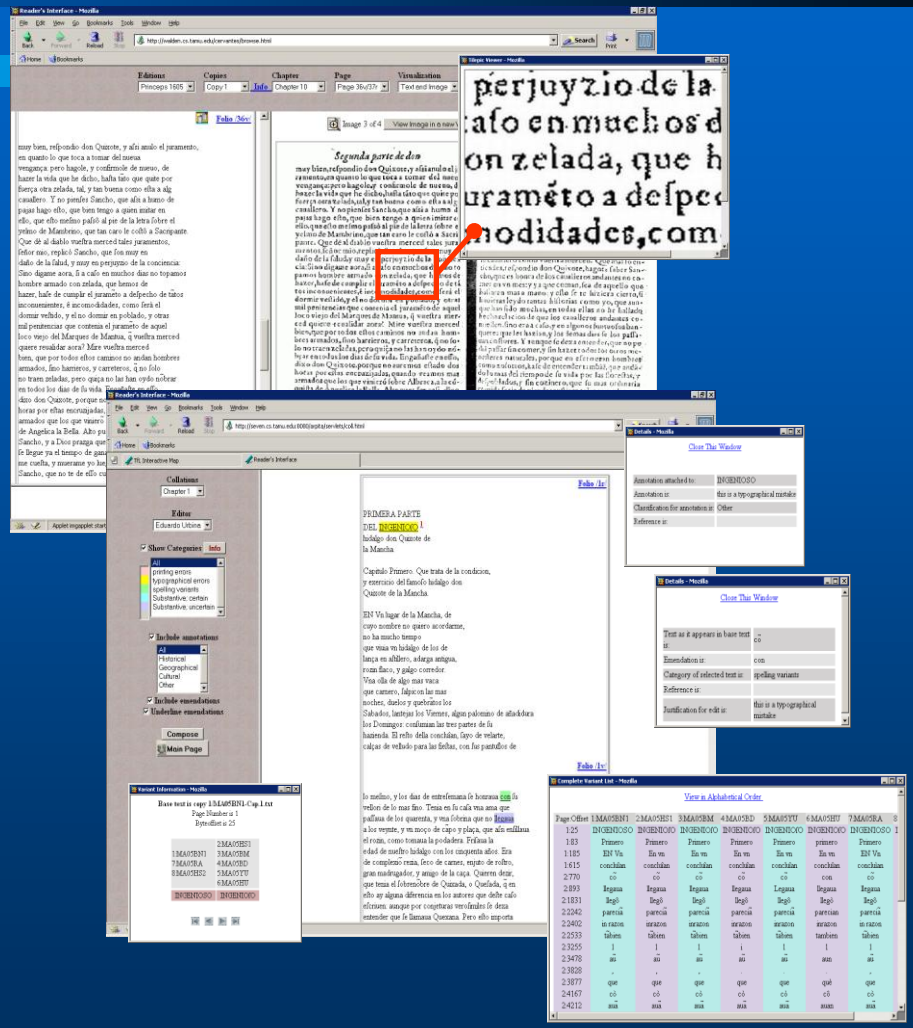
# Electronic *Variorum* Edition (EVE)

- **Significant early editions of *Don Quixote* in facsimile and transcription**
  - **1605 and 1615 *princeps***
    - **10 copies of 1605 *princeps*; similar number of 1615 *princeps***
    - **Over 30 copies of other key editions published between 1605 and 1637**
- **Two components: VERI and MVED**



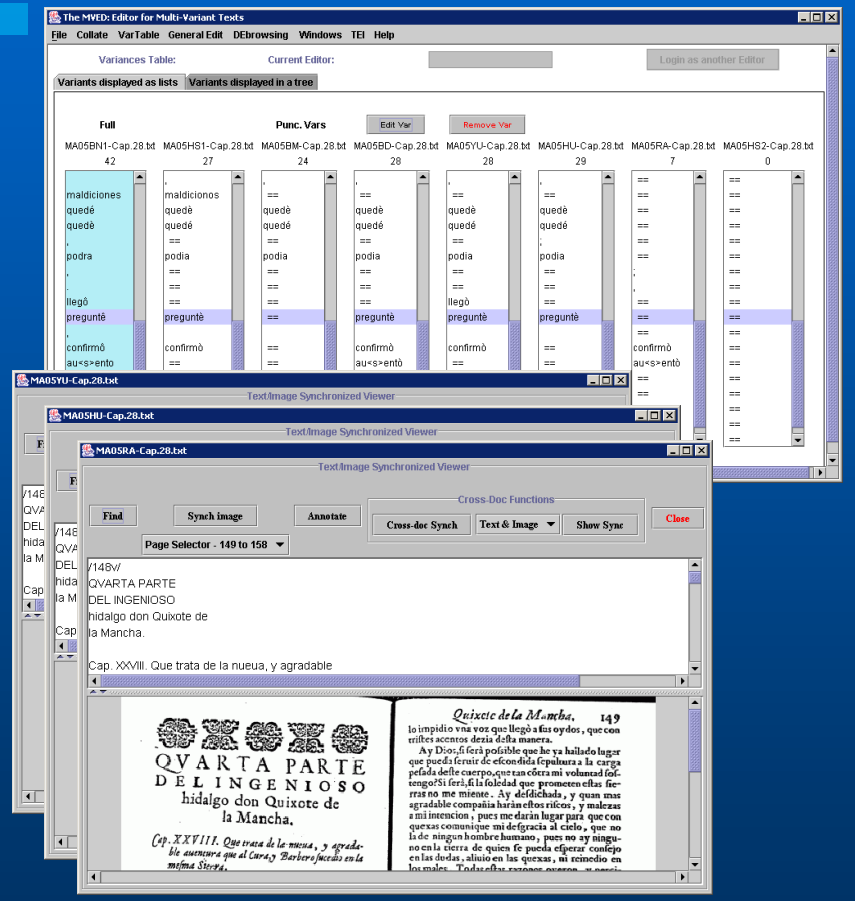
# Virtual Edition Readers Interface (VERI)

- Browse multiple editions and copies
- Display text, page images, or both
- Synchronize textual transcription with page images
- View variants with editorial commentary

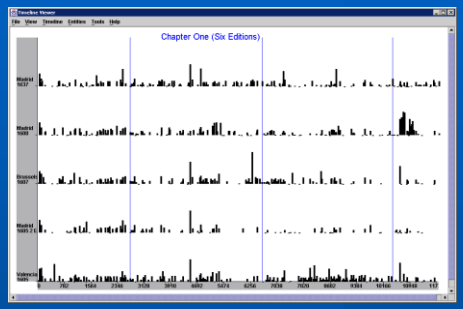


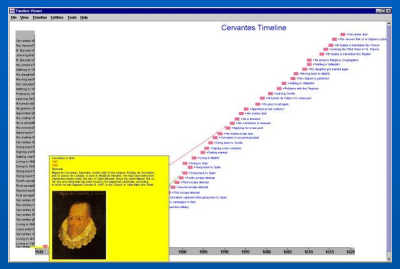
# Multi-Variant Editor for Documents (MVED)

- Editing interface allows creation of an edition
- Interlinked text/facsimile representation of collection
- MVED identifies variants and allows their classification
- Supports inclusion of annotation, e.g., interpretative commentary
- Stand-alone application

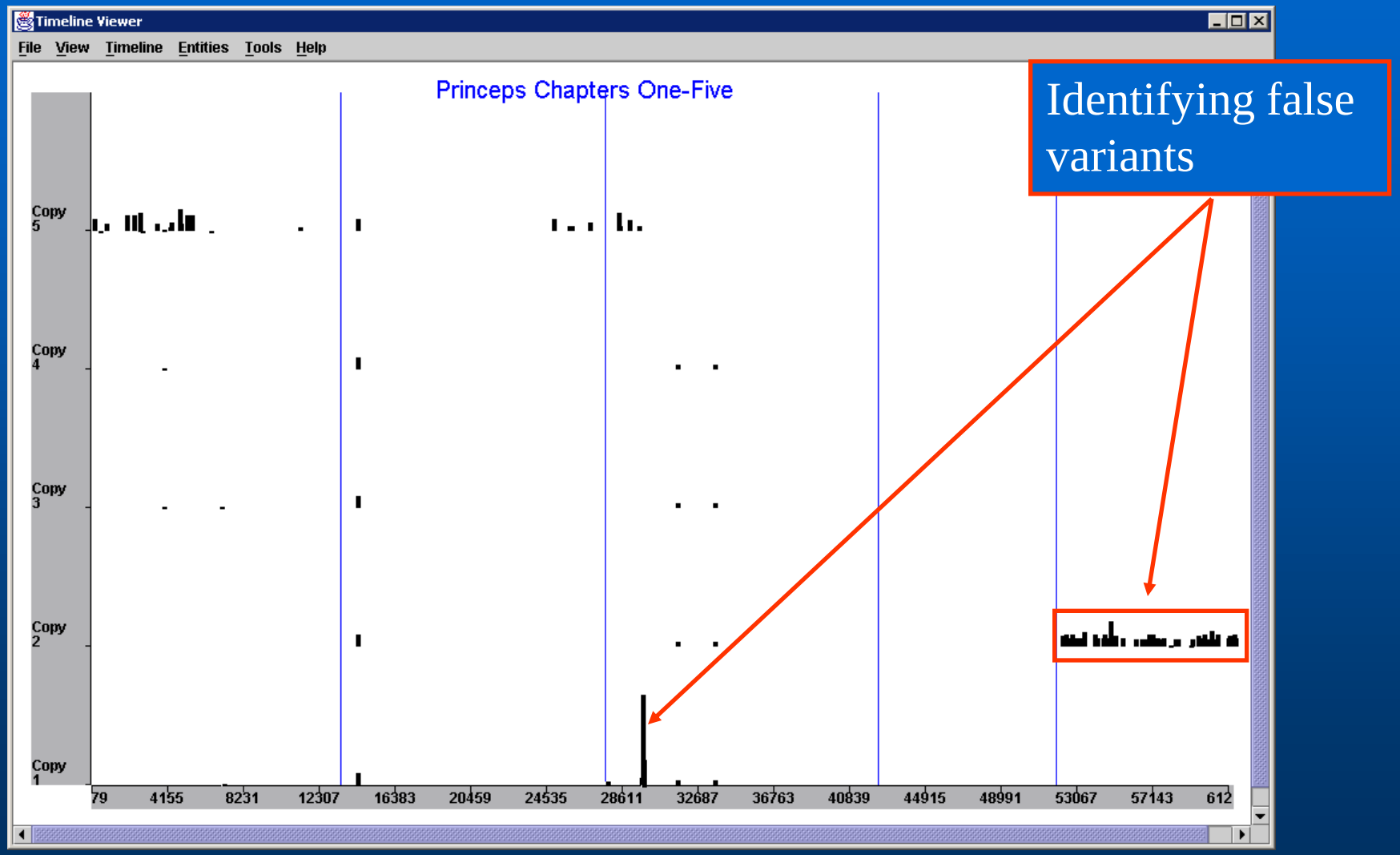


# Synergistic project development

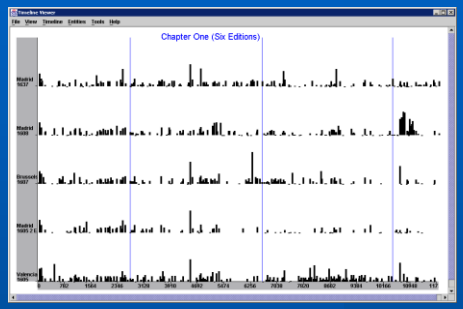


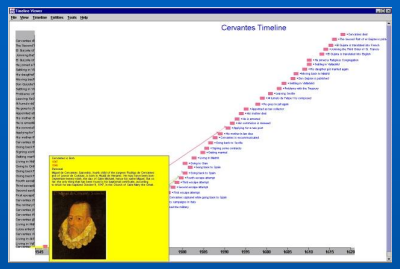



# Analyzing copies of the same edition



# Synergistic project development

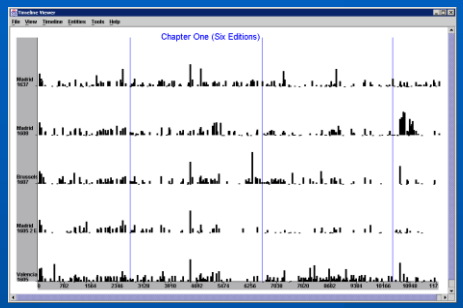


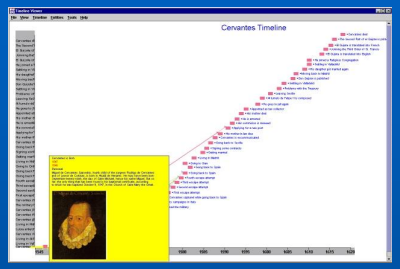



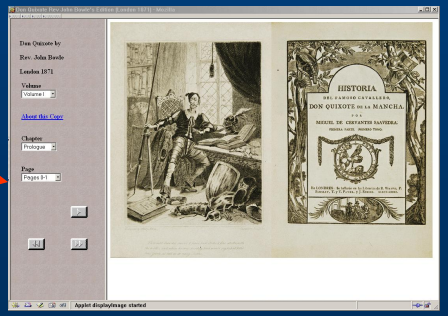
# Textual iconography of *Don Quixote*

- **Cushing Library has acquired 405 editions of the Quixote published since 1620**
  - **Over 800 volumes**
  - **Concentrated in 18th and 19th century (English, French, Spanish)**
  - **Currently, more than 4,000 images digitized from 74 editions**

# Synergistic project development

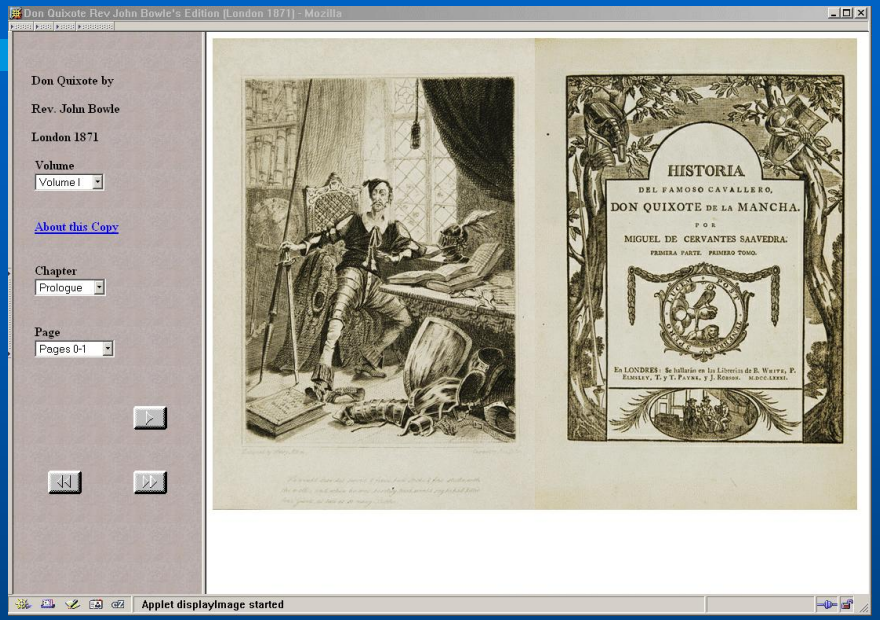




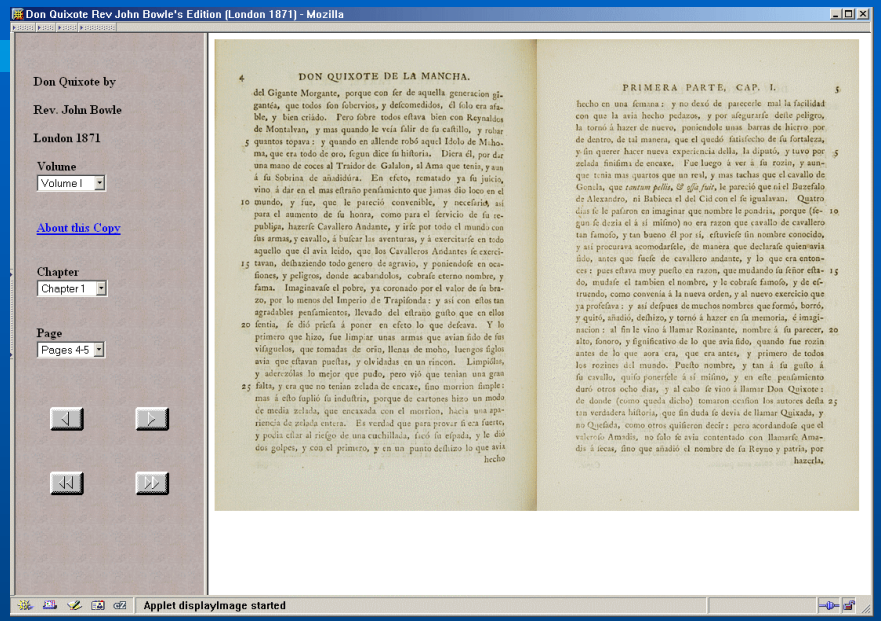
# Bowle Edition

- **Rev. John Bowle, 1781, London**
- **Electronic edition employs software used in the VERI**
- **Two presentations**
  - **Traditional book presentation**
  - **Combined book presentation**



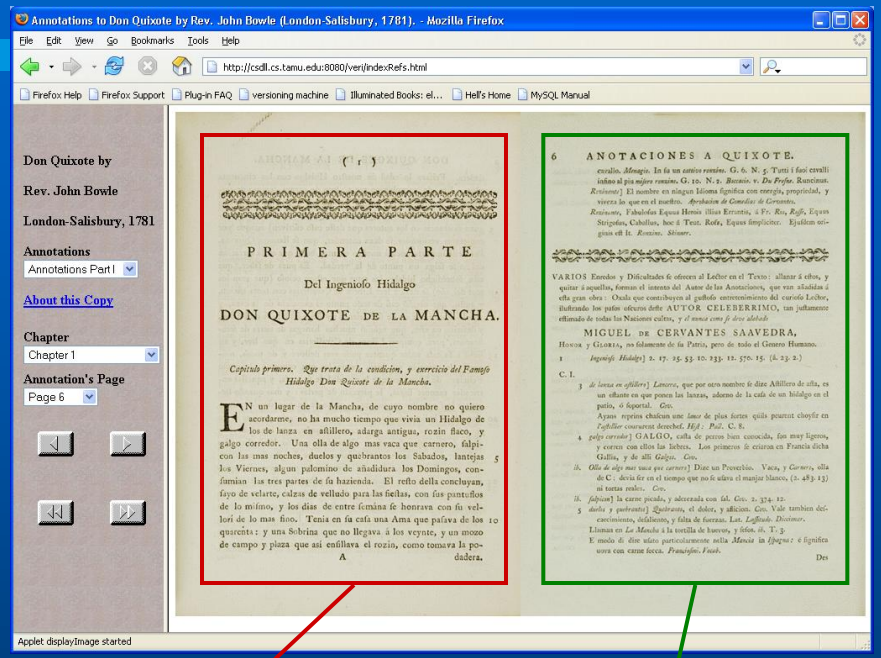
# Bowle Edition

- **Traditional book presentation**



# Bowle Edition

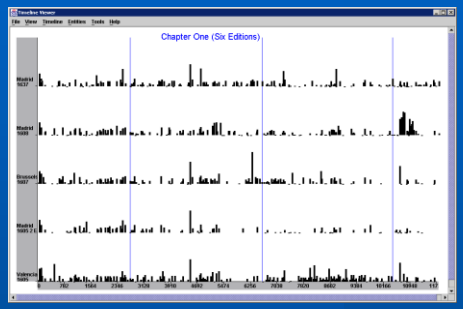
- **Combined book presentation**
- **Brings annotations (from volume 3) along side the text they annotate (from volumes 1 and 2)**

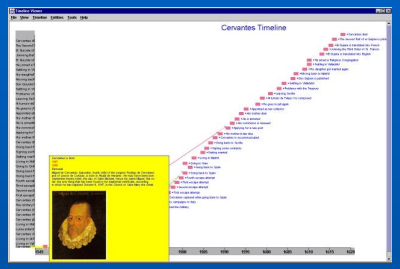


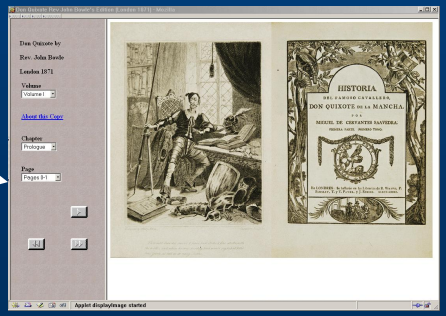

Chapter 1 Text (vol. 1)

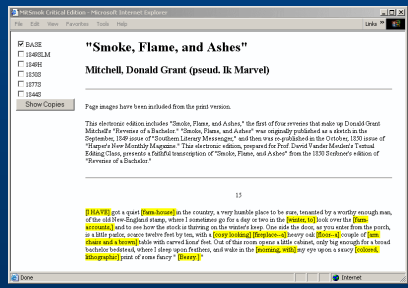
Chapter 1 Annotations (vol. 3)

# Synergistic project development





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1850S
1877S
1844S
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# "Smoke, Flame, and Ashes"

## Mitchell, Donald Grant (pseud. Ik Marvel)

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Page images have been included from the print version.

This electronic edition includes "Smoke, Flame, and Ashes," the first of four reveries that make up Donald Grant Mitchell's "Reveries of a Bachelor." "Smoke, Flame, and Ashes" was originally published as a sketch in the September, 1849 issue of "Southern Literary Messenger," and then was re-published in the October, 1850 issue of "Harper's New Monthly Magazine." This electronic edition, prepared for Prof. David Vander Meulen's Textual Editing Class, presents a faithful transcription of "Smoke, Flame, and Ashes" from the 1850 Scribner's edition of "Reveries of a Bachelor."

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15

[I HAVE] got a quiet [farm-house] in the country, a very humble place to be sure, tenanted by a worthy enough man, of the old New-England stamp, where I sometimes go for a day or two in the [winter, to] look over the [farm-accounts,] and to see how the stock is thriving on the winter's keep. One side the door, as you enter from the porch, is a little parlor, scarce twelve feet by ten, with a [cosy looking] [fireplace--a] heavy oak [floor--a] couple of [arm chairs and a brown] table with carved lions' feet. Out of this room opens a little cabinet, only big enough for a broad bachelor bedstead, where I sleep upon feathers, and wake in the [morning, with] my eye upon a saucy [colored, lithographic] print of some fancy " [Bessy.] "

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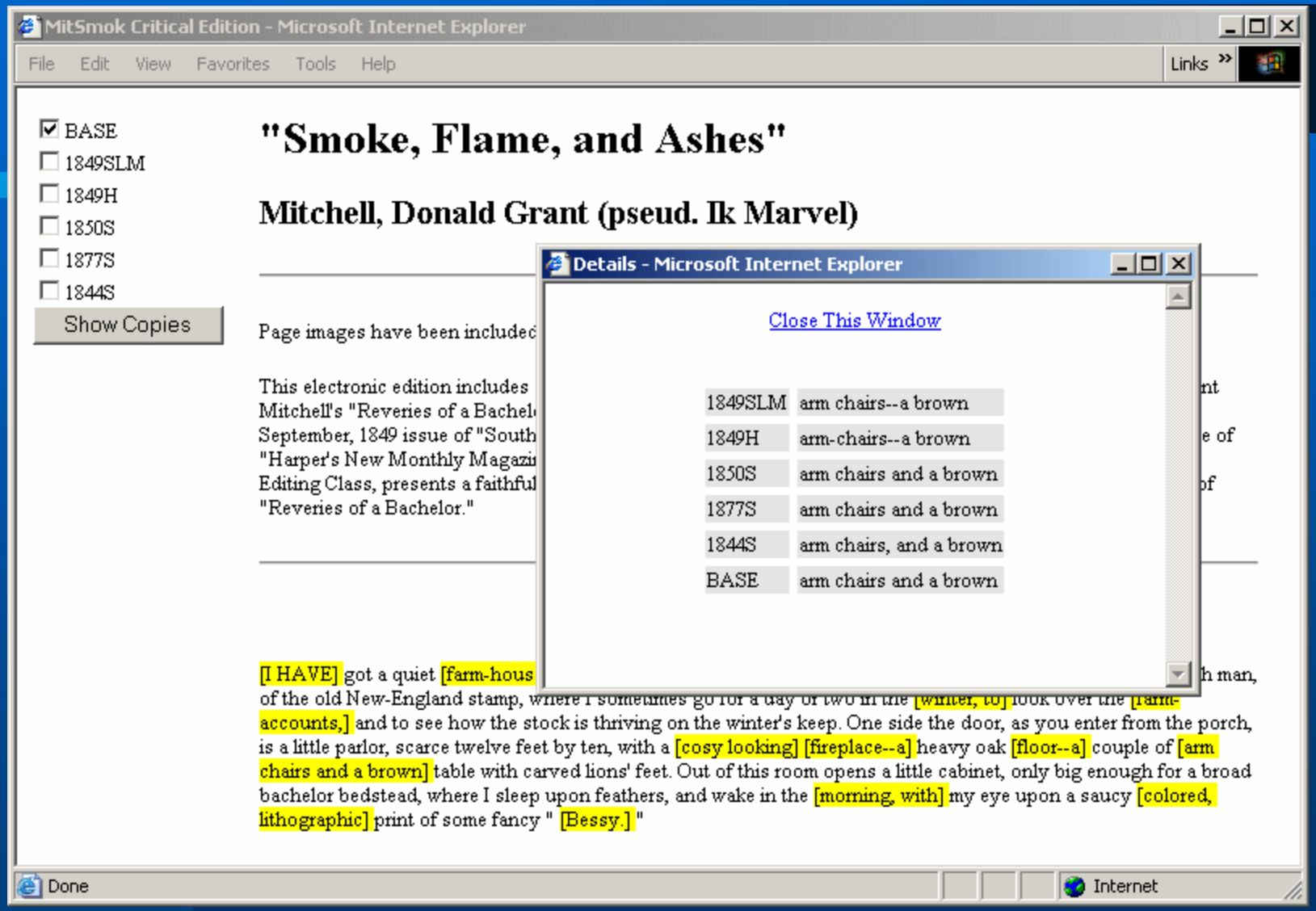
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"Smoke, Flame, and Ashes"
Mitchell, Donald Grant (pseud. Ik Marvel)
Page images have been included
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Mitchell's "Reveries of a Bachel
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1844S arm chairs, and a brown
BASE arm chairs and a brown
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# "Smoke, Flame, and Ashes"

## Mitchell, Donald Grant (pseud. Ik Marvel)

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Page images have been included from the print version.

This electronic edition includes "Smoke, Flame, and Ashes," the first of four reveries that make up Donald Grant Mitchell's "Reveries of a Bachelor." "Smoke, Flame, and Ashes" was originally published as a sketch in the September, 1849 issue of "Southern Literary Messenger," and then was re-published in the October, 1850 issue of "Harper's New Monthly Magazine." This electronic edition, prepared for Prof. David Vander Meulen's Textual Editing Class, presents a faithful transcription of "Smoke, Flame, and Ashes" from the 1850 Scribner's edition of "Reveries of a Bachelor."

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15

[I HAVE] got a quiet [farmhouse] [farm-house] in the country, a very humble place to be sure, tenanted by a worthy enough man, of the old New-England stamp, where I sometimes go for a day or two in the [winter, to] look over the [farm accounts,] [farm-accounts,] and to see how the stock is thriving on the winter's keep. One side the door, as you enter from the porch, is a little parlor, scarce twelve feet by ten, with a [cosy-looking] [cosy looking] [fireplace, a] [fireplace--a] heavy oak [floor, a] [floor--a] couple of [arm chairs, and a brown] [arm chairs and a brown] table with carved lions' feet. Out of this room opens a little cabinet, only big enough for a broad bachelor bedstead, where I sleep upon feathers, and wake in the [morning with] [morning, with] my eye upon a saucy [colored lithographic] [colored, lithographic] print of some fancy " [Bessie] [Bessy.] "

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# "Smoke, Flame, and Ashes"

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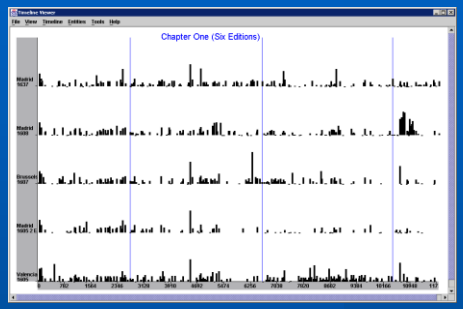
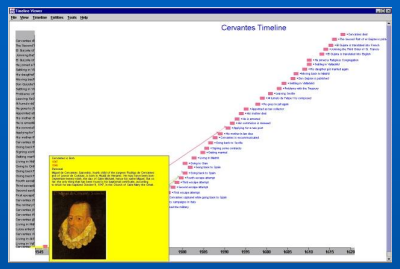
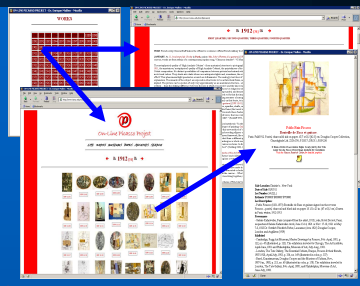
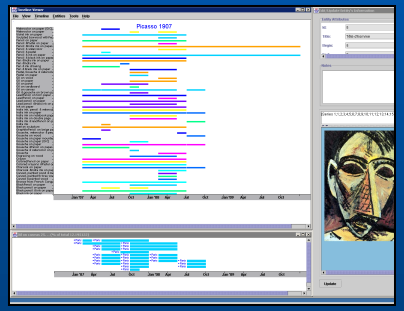
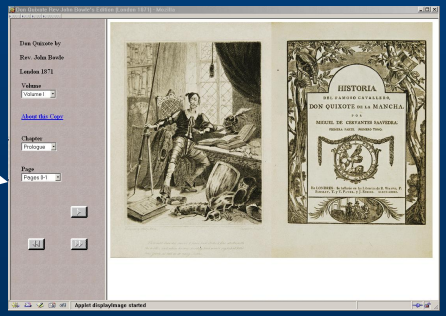
# Synergistic project development

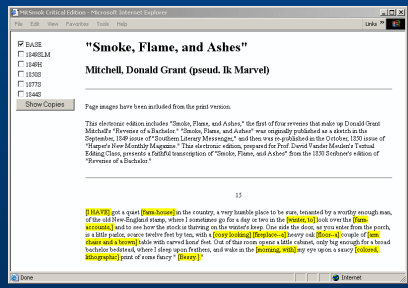


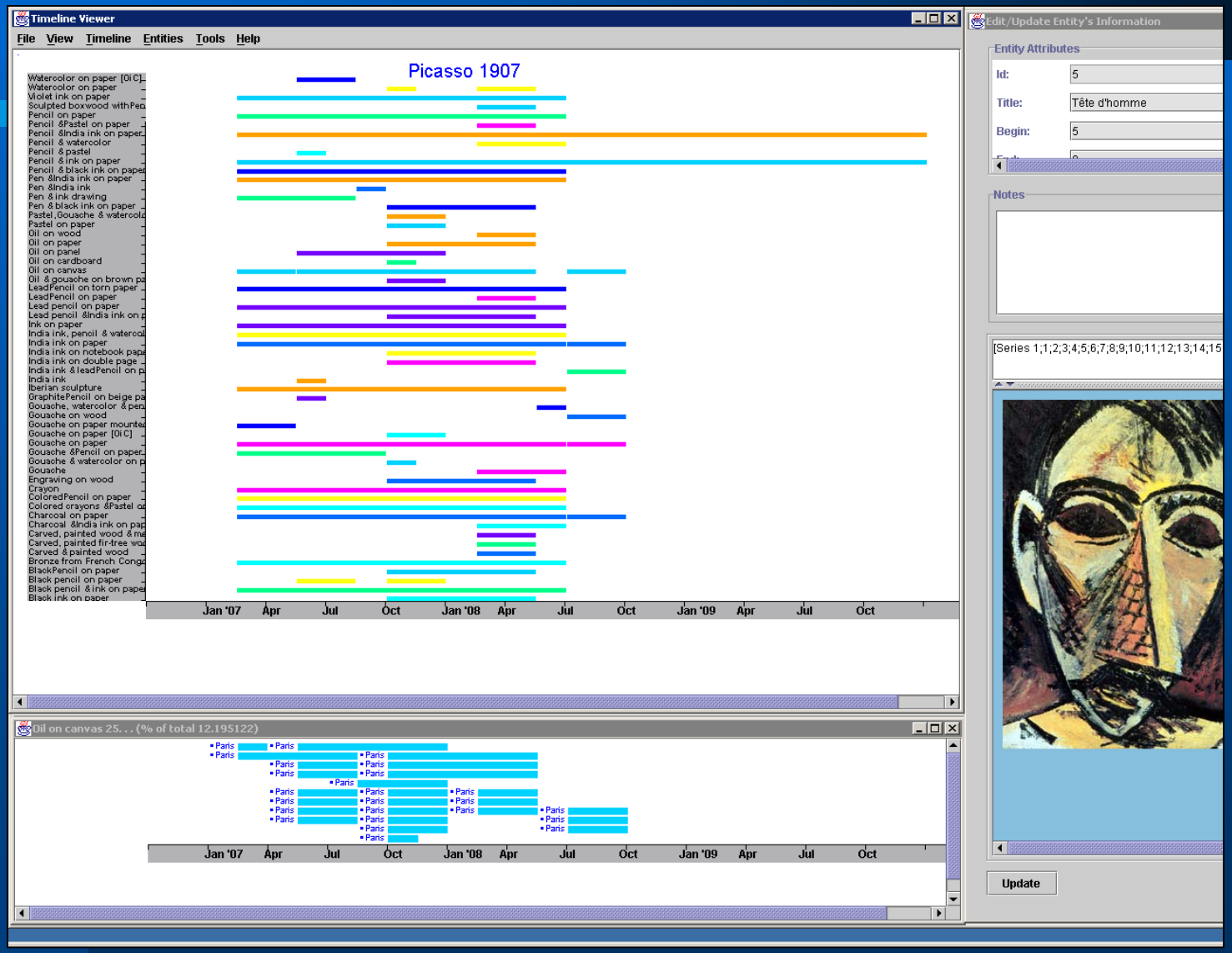







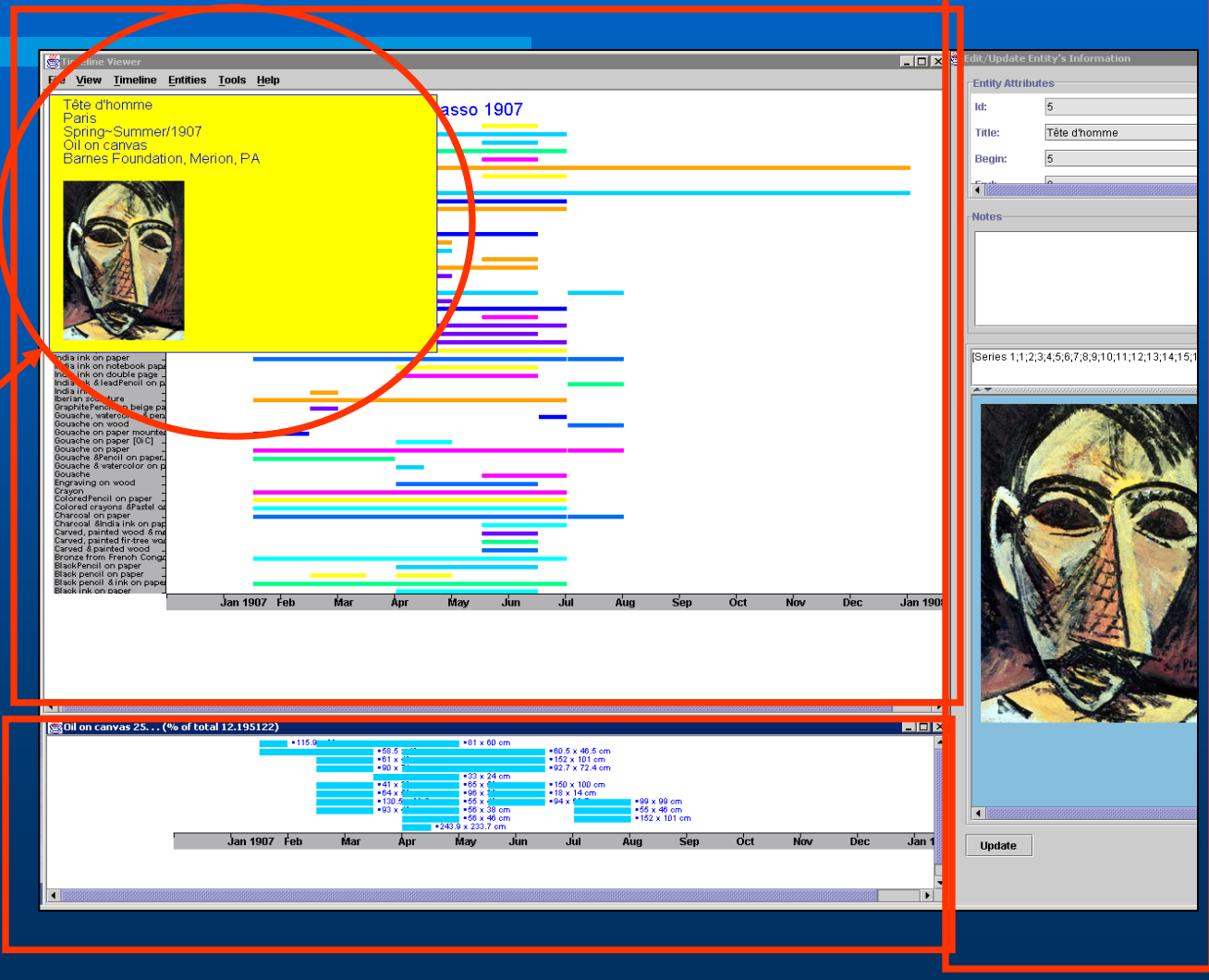
# Visualizing and Exploring Picasso's World



# Visualizing and Exploring Picasso's World

Overview

2nd level of detail

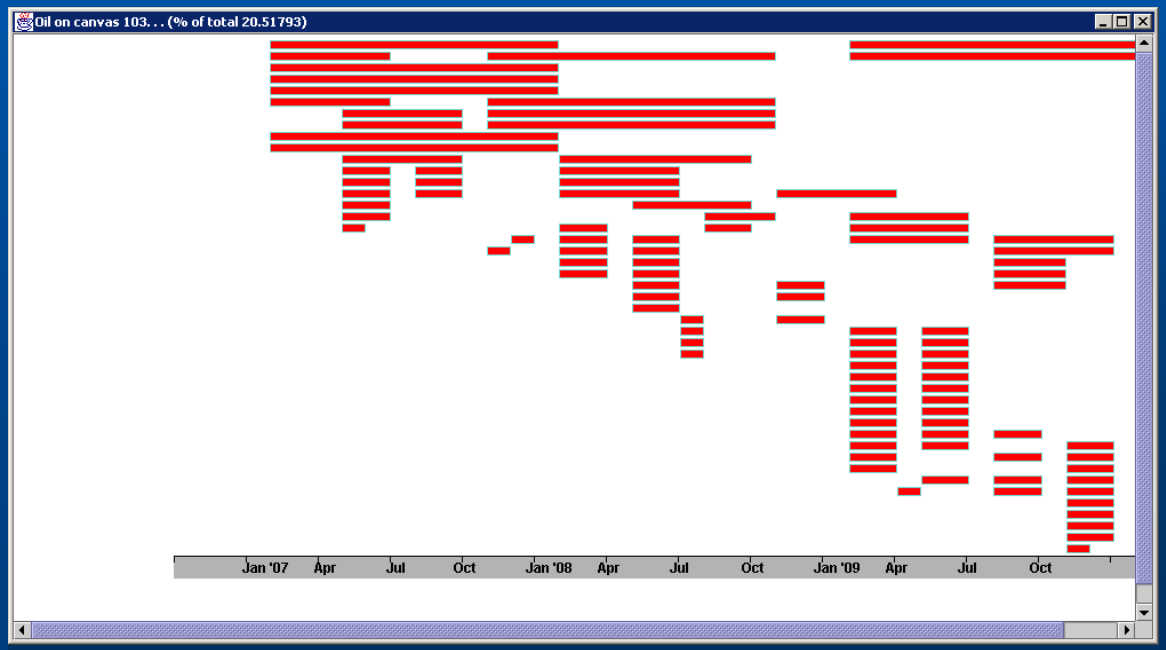



3rd level of detail

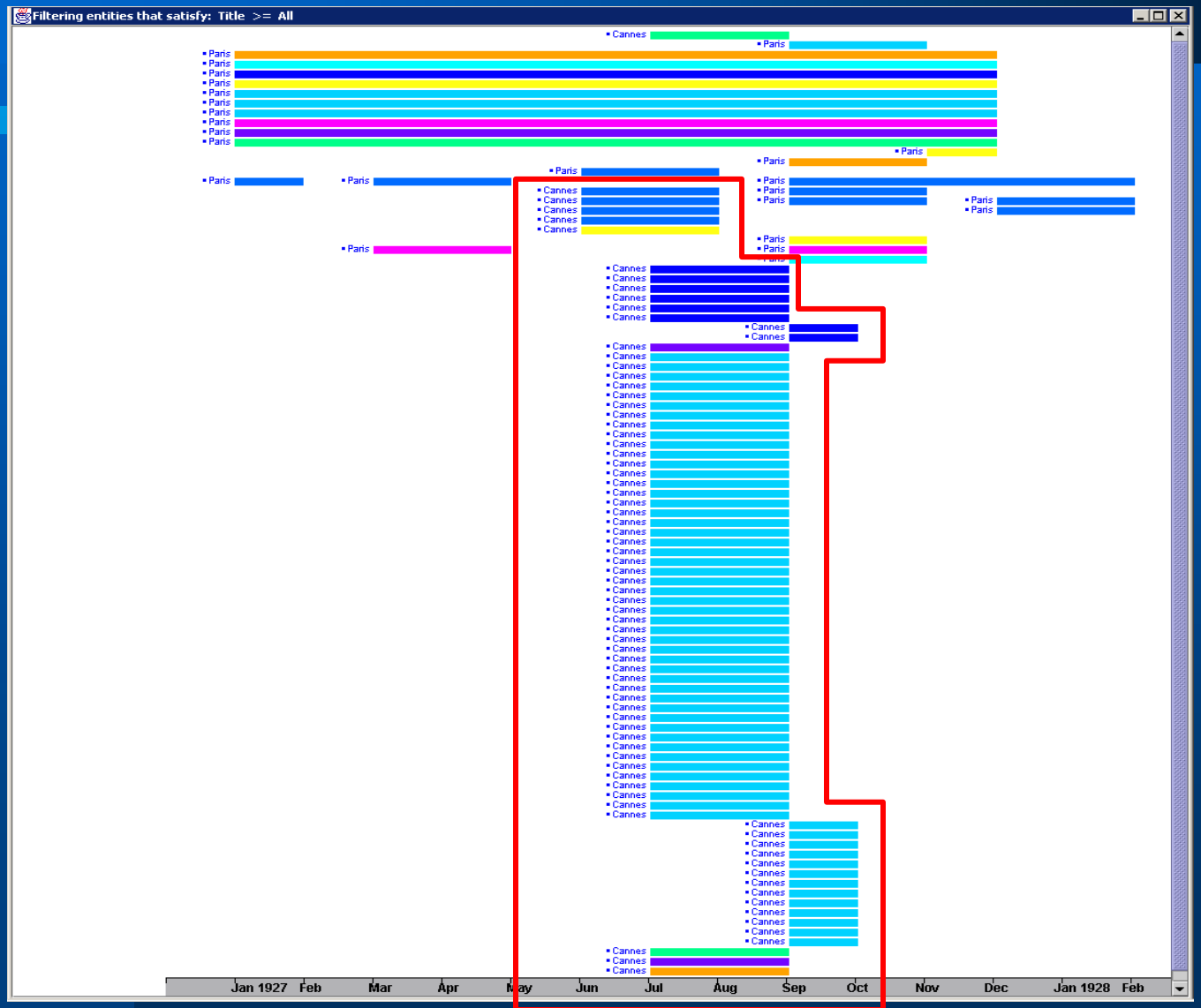
1st level of detail

# Analyzing Picasso's World

What kind of artworks did he create during any given period of time?
Was there any trend in which he painted in two different decades?
What kind of techniques did he use the most in any given year or season?
Was he more productive during a particular season: summer, fall, spring, or winter?
Discovering correlations of Picasso's series in different periods.



# Discovering Patterns in Picasso



# Concluding remarks

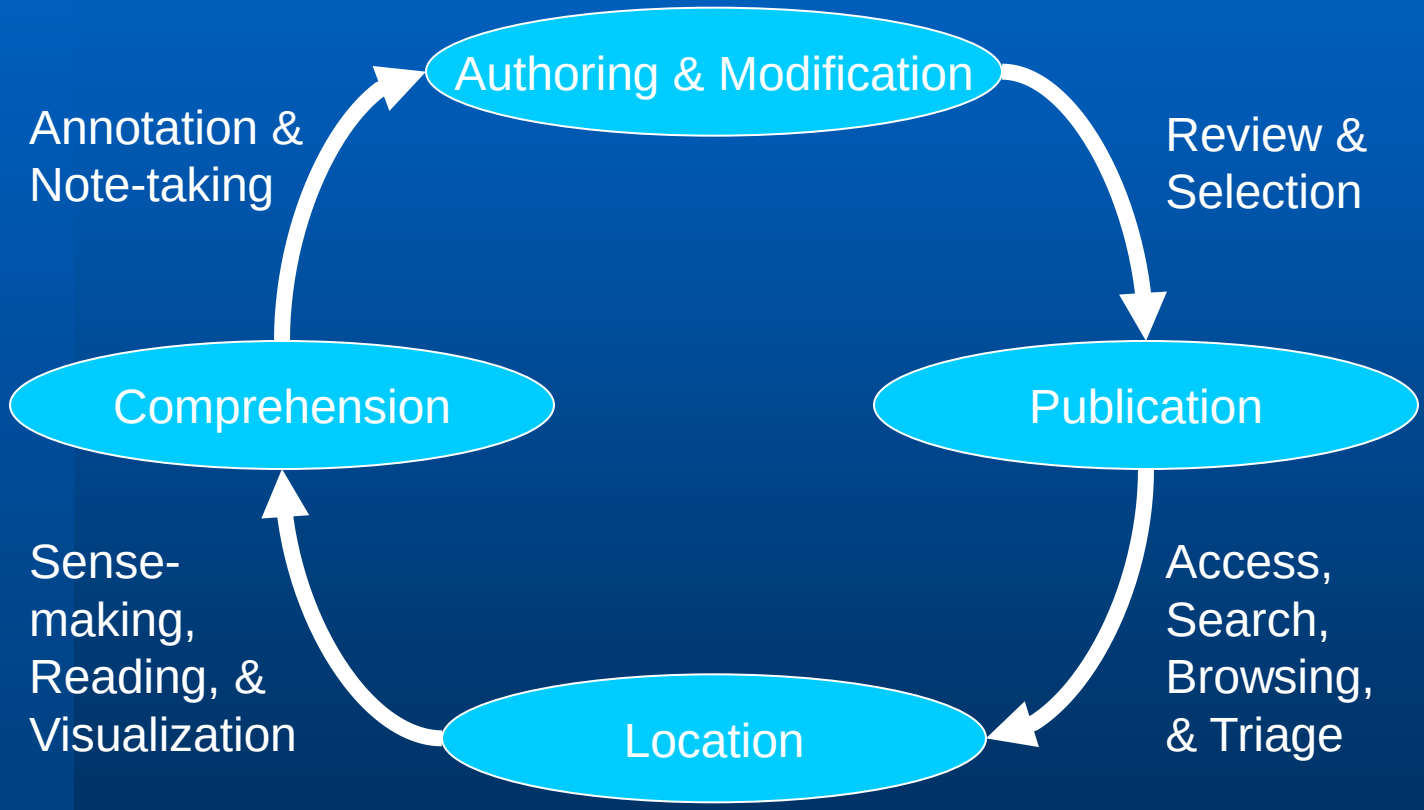
- We have presented a quick overview of some of the projects In the Center for the Study of Digital Libraries
- With the widespread availability of the Internet and the Web, information technology is affecting many areas of life
- Highly interdisciplinary problems need highly interdisciplinary solutions
- Cooperative efforts and collaboration among academic disciplines can yield results of interest to both, of widespread service, and with potential for making fundamental changes to the ways we work and communicate.

# For more information

http://www.csdl.tamu.edu/

# More information about CSDL research

# Information Lifecycle



# Common Research Themes

- **Adaptive Information Delivery**
  **Contextualizing the presentation of information**
- **Information Visualization**
  **Generating views containing a variety of content**
- **Collection Creation & Maintenance**
  **Supporting resource selection and upkeep, metadata authoring**
- **Time/History in Interfaces**
  **Temporal qualities in content and its presentation**

# Time in Content

- **Forms of time-based information.**
  - **Audio/video information**
  - **Documents that include edit history**
  - **Historical collections**
  - **Simulations**
- **Authoring, publishing, locating, and presenting this content requires tools that let users cope with time.**
  - **VKB project spaces**
  - **Cervantes Quixote Variorum**

# Visual Knowledge Builder (VKB): Supporting Personal Collections

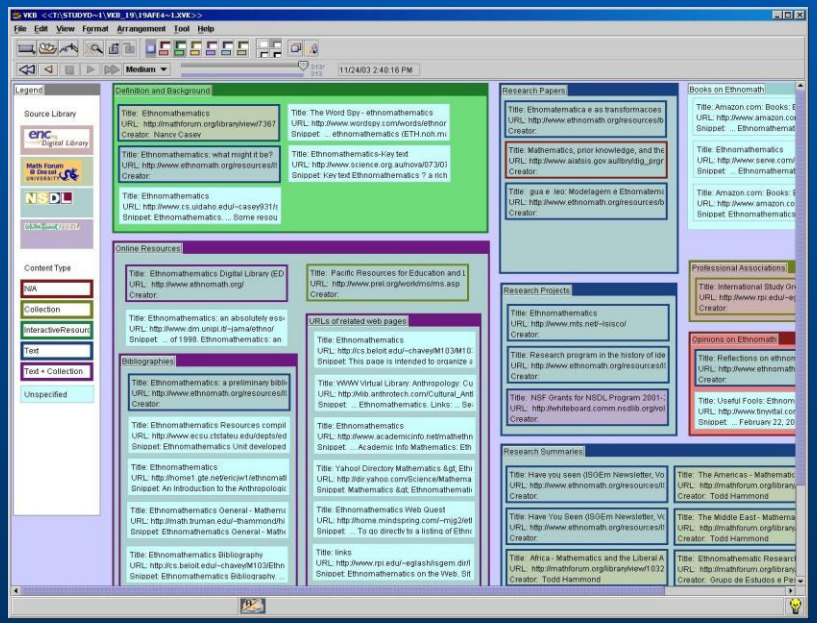
Frank Shipman

- **Problem: information tasks require a combination of location, comprehension, and modification**
  - **Current systems have emphasized the location of information (e.g. search engines, portals)**
  - **There are few tools supporting the activity of comprehending and modifying the found content**
- **Approach: Spatial hypertext**
  - **Spatial hypertext expresses inter-document relationships via visual and spatial cues**
  - **Users develop personal visual languages during the course of their activities**
  - **The system can recognize parts of the visual language and interpretation to support the user's task.**

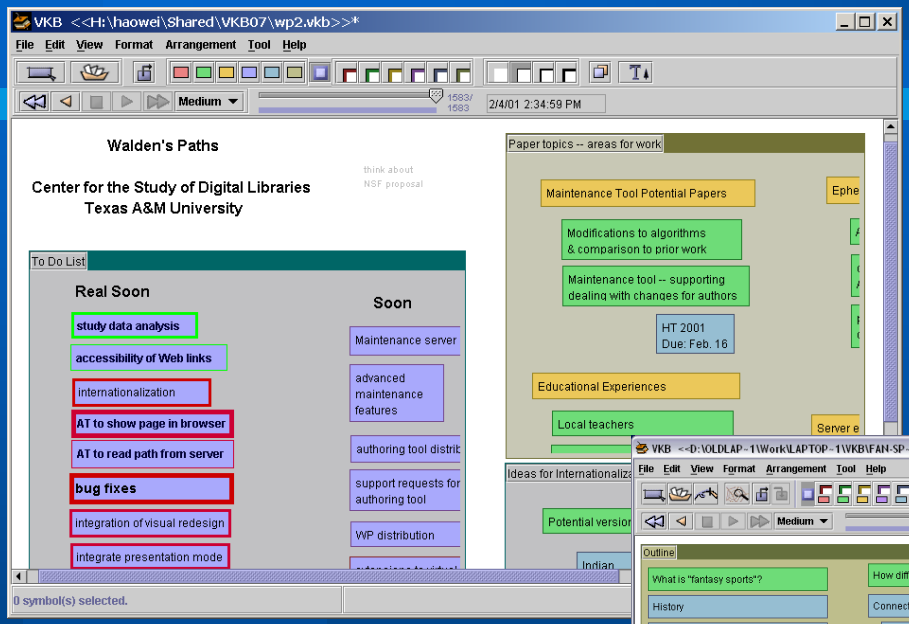
# Expressing Relations Visually

**VKB provides:**

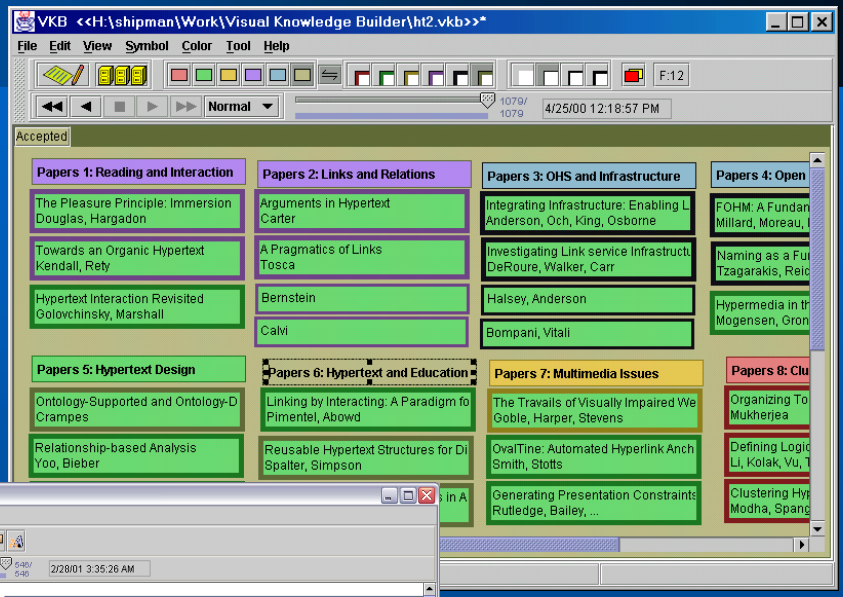
- **A hierarchy of two-dimensional workspaces called collections for placing information**
- **Easy manipulation of visual properties of information**
- **Information objects pointing to external content**
- **Attribute/value pairs for attaching metadata**



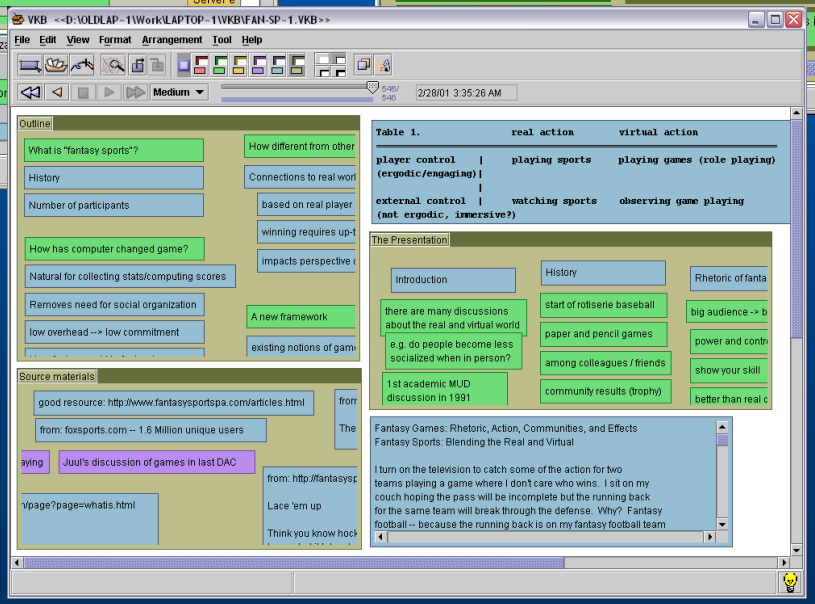
# Experience with VKB Use




Project Management




Conference Planning



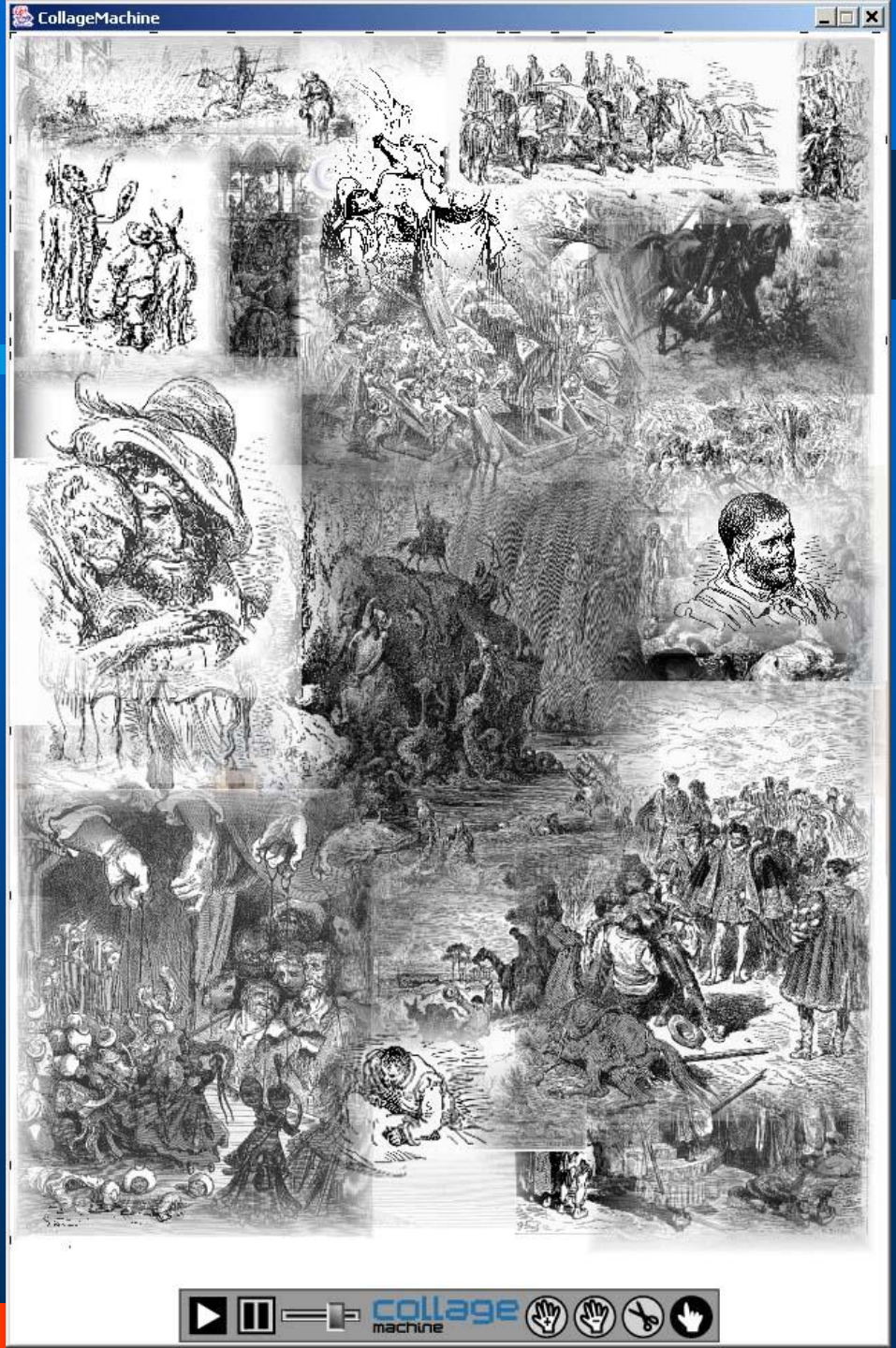

Writing Papers & Creating Presentations

# Time in Presentation

- **Time-based presentations of static content can aid information discovery**
  - **combinFormation information spaces**
  - **Collection Understanding tools**
- **Time can be used to structure information delivery and allow collaboration**
  - **EFG/ICT groupware**
  - **Trellis/caT presentations**

# combinFormation

Andruid Kerne


CollageMachine
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CollageMachine
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CollageMachine
Browsable Graphic Editions (image scans of text)
Fred Jehle of Indiana-Purdue
Men; en Espa ol
Don Quixote Dictionary
Compiled by Tom Lathrop
The CDL is a digital library of Cervantes's complete works in several versions ( princeps, old-spelling, modernized, English) along with the interfaces, hypertext links, and search engines to facilitate their use at multiple levels.
Center for the Study of Digital Libraries (CSDL) (part of the TAMU Engineering Program)
Men ; en Espa ol
The Cervantes Digital Library is a project developed in collaboration with the Center for the Study of Digital Libraries and Prof.
collage machine

# Time in Presentation

- **Time-based presentations of static content can aid information discovery**
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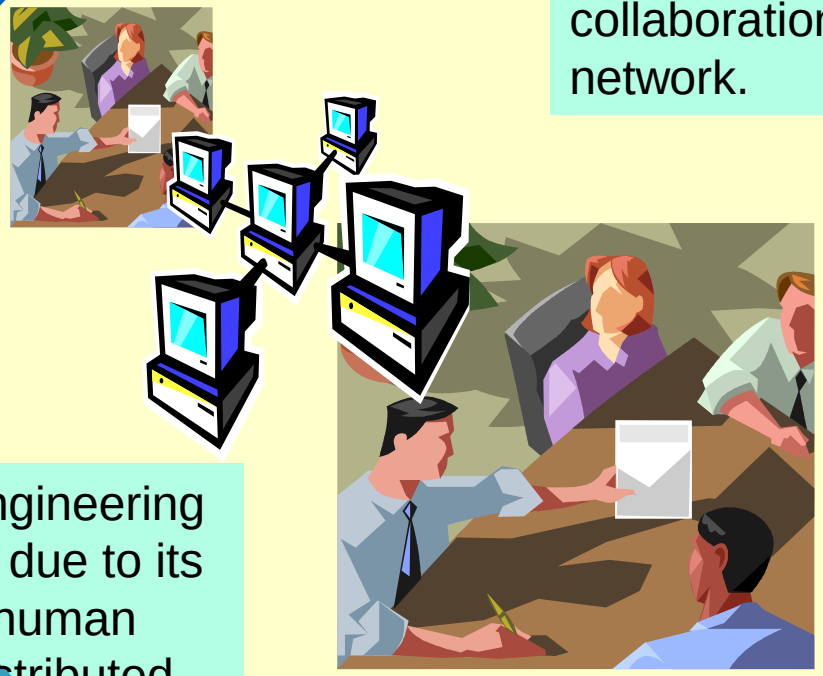
We collaborate in real life and should not be separated in the Internet age. Groupware aims to facilitate people collaboration over a computer network.



Groupware engineering is challenging due to its emphasis on human factors in a distributed system. Our group addresses groupware engineering challenges from three related directions.

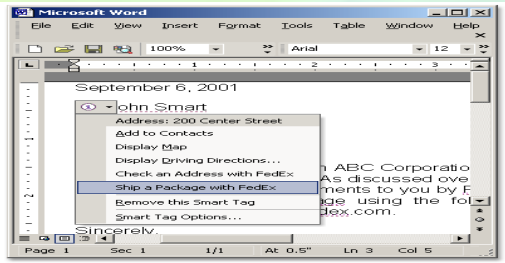
**Collaboration Modeling and Infrastructure**

**Du Li**

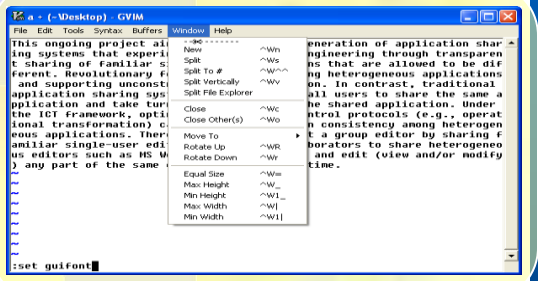
# ICT: Intelligent Collaboration Transparency

Specialized groupware applications generally lag behind in features with single-user applications. Users are often not motivated to abandon familiar single-user applications for groupware features that are less frequently used.

Microsoft Word



GVim



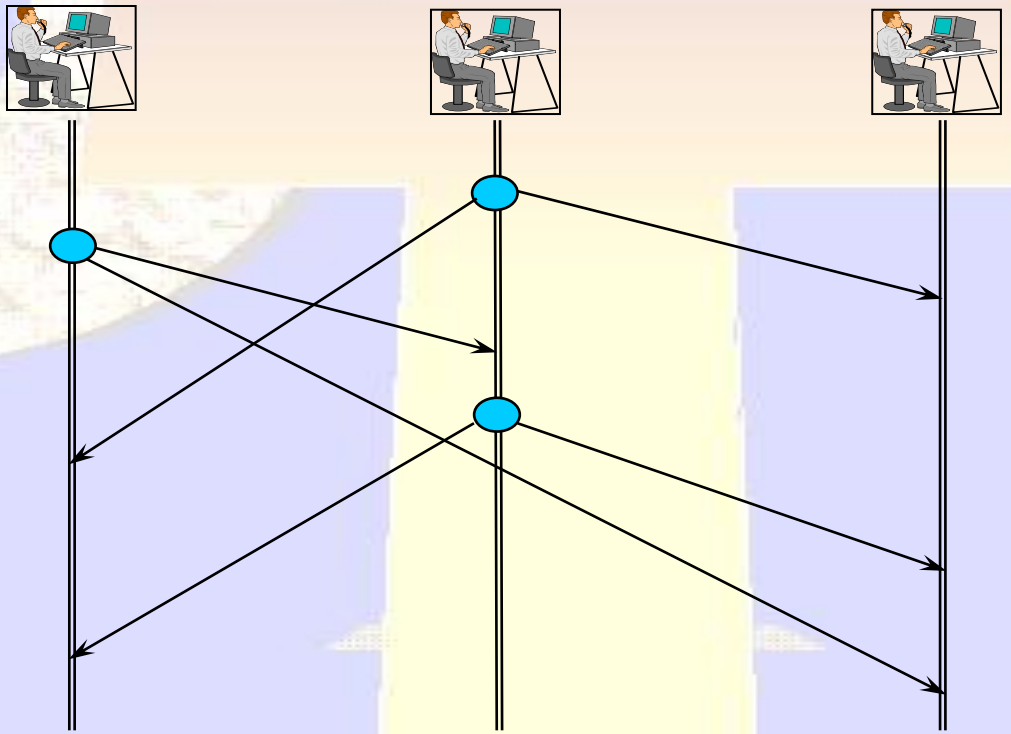

The ICT project aims to develop a new generation of application sharing systems that allow users to share familiar single-user applications for cooperative work without modifying the original programs.

The application sharing infrastructure incrementally formalizes application and collaboration knowledge such that interoperation between heterogeneous single-user applications is possible and a wide range of collaboration protocols can be experimented.

Group editors are a model of interactive groupware. They allow geographically dispersed users to edit a shared document at the same time. Operational transformation is a standard method for consistency maintenance and group undo in group editors.

Interactive groupware applications have special requirements for high responsiveness, high concurrency, real-time awareness, non-blocking and unconstrained interaction, in addition to consistency.

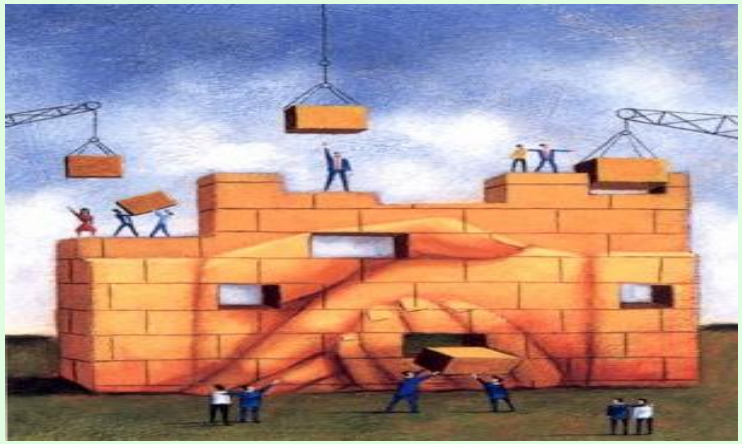
We develop a suite of novel OT algorithms to address the consistency, scalability, flexibility, and usability issues in interactive groupware. Specific algorithms include state difference transformation, time interval based operational transformation, and regional undo. We also extend and apply OT algorithms in non-groupware domains such as databases.



**OT: Operational Transformation**

# EFG: Evolvable Framework & Groupware

Social collaboration is dynamic and evolutionary. Different groups have different protocols for collaboration. The way people work together evolves over time as users gain more experience with the system.



Groupware must be highly customizable and evolvable. For rapidly changing domains and cooperative tasks where requirements emerge and develop during actual use, some aspects of the evolution must be handled by end users. At the same time, the system must synergistically adapt to the behavior of individual users and the group as a whole.

The EFG project explores a component based approach for developing evolvable groupware. It provides services and user interfaces to support the dynamic evolution of various aspects of the system: Some collaboration protocols are specified and evolved by end users. Groupware features are dynamically attached to third-party, single-user components at run time without modifying source code.