Variations2
Women in Computing
Technical Hour

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Metadata Librarian
Indiana University Digital Library Program
A collaborative organizational unit – campuswide and systemwide – created to:

- Provide financial support and human resources to support for existing digital library initiatives;
- Provide infrastructure, financial support, and expertise to develop new digital initiatives across the campuses of Indiana University.
- Provide leadership in the development of digital libraries locally, nationally, and internationally.
IU Digital Library Program (2)

- Joint project of IU Libraries and UITS
- Research support from SLIS and Informatics
- Created in 1997
- 12 FTE permanent staff
  - 6 Libraries
  - 4 UITS
  - 2 jointly funded
- 10 FTE additional grant-funded staff
The Variations2 Project

- $3M grant from the National Science Foundation through the Digital Libraries Initiative—Phase 2 program
- Builds on the high-profile Variations project
  - ~7000 recordings
  - ~200 scores
- Funding through UITS to the Digital Library Program to support Music Library and School of Music activities
- Will end in September 2005; additional funding applied for
Goals of Variations2

- An integrated multimedia library system to provide navigation, search, and retrieval functions for a large and diverse information space.
- A software framework to make digital music objects accessible to music instructors and application developers, using a component-based programming architecture.
Formats currently covered

- Digital audio (from CD, LP, open reel tape, etc.)
- Scanned score pages
- Encoded scores
- What’s missing?
  - Liner notes
  - Video
  - Record jackets
  - Concert programs
Variations2 staffing

- 5 FTE grant-funded staff
- 7 GAs
- Student employees
- Involvement from at least 8 other Libraries, School of Music and UITS staff and faculty
- Other faculty as project investigators
Research areas

- Copyright
- Metadata
- Instruction
- System Design
- Usability
Research areas

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- Metadata
- Instruction
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- Usability
Some staffing breakdowns

- Development team
  - 5 grant-funded staff (male)
  - 1 GA (male)
  - 1 manager (male)

- Metadata team
  - 3 librarians (female)
  - 1-2 GAs (female)

- Usability team
  - Headed by development team member (male)
  - 1 GA (female)
Variations2 demo

Schubert pilot
Technical environment

- Java client application / RMI servers
- Windows and Mac OS X client platforms
- Unix server
- QuickTime for Java, Darwin Streaming Server
- IBM DB2
- AT&T DjVu image compression
Variations2 Data Model

- Uses entity-relationship analysis to identify key concepts, properties, and relationships of musical objects
- Identifies, separates, and relates logical and physical layers of musical works and their physical manifestations
- Similar to FRBR from IFLA, but designed specifically for music
- In addition to descriptive metadata, also includes structural and technical metadata
Data Model: Entities

WORK
- is manifested in
  INSTANTIATION
- is enclosed in
  CONTAINER
- is represented by
  MEDIA OBJECT

CONTRIBUTOR
- is created by

WORK represents the abstract concept of a musical composition or set of compositions.
INSTANTIATION represents a manifestation of a work as a recorded performance or a score.
CONTAINER represents the physical item or set of items on which one or more instantiations of works can be found (e.g., CD, score).
MEDIA OBJECT represents a piece of digital media content (e.g., sound file, score image).
CONTRIBUTOR represents people or groups that contribute to a work, instantiation, or container.
Data Model: Example

CONTRIBUTORS
- Horowitz, pianist
- Uchida, pianist
- Mozart, composer
- Broder, editor

WORKS
- Sonata K. 279
- Fantasia K. 397

INSTANTIATIONS
- Sonata K. 279 recorded in 1965, Carnegie Hall
- Fantasia K. 397 recorded in 1991, Tokyo, Suntory Hall

CONTAINERS
- CD: Mozart, Piano Works
- Score: Mozart, Piano Fantasia K.397

Prepared from autographs in 1960
Data Model: Benefits

- Increases comprehensiveness and precision of search results
- Provides linkage of works in multiple formats on various levels
- Allows for navigation within the work and between its different instantiations
- Provides appropriate and complete descriptive, administrative, and structural metadata for each entity
- Provides for Variations2 as a research system in addition to a discovery system
Usability research

To “study how students, faculty, and library patrons use digital music resources—and learn how technology can be used or adapted to help this process.”

Users involved continuously at all stages of project development

General evaluation of entire system and individual studies of specific aspects
Methodologies employed

- Contextual inquiry: observations of Variations and Variations2 actual usage
- Lab-based usability testing of prototypes and finished releases
- Questionnaire studies during pilot use of Variations2 by classes
- Interviews of instructors after using Variations2
- Interviews with instructors who do NOT use Variations2
- Log file analysis of Variations2 usage, both during pilot projects and during normal use
General usability evaluations

- Searching
- Audio Player
- Score Viewer
- Printing
- Bookmarking
- Timeline Tool
- Paired vs. Individual User
- Satisfaction Ratings
Usability evaluation of Variations

- Aid in user requirements and task analysis for Variations2
- Measure a baseline for comparison of satisfaction ratings between the original Variations system and Variations2
- Compare satisfaction measures in a usability lab testing situation vs. real contextual usage.
Usability evaluation of searching

- Evaluate the usability of the search interface
- Evaluate the functionality of the search results
- Investigate use of diacritics and multiple spellings in relation to searching
Usability evaluation of installation

- Usability of new installer program
- Effectiveness of installation help text
Usability evaluation of MMTT

- Evaluate student learning potential in light of a variety of lesson content and presentation formats (i.e. question difficulty, appropriateness of musical examples, ease of completing harmonic analysis, melodic dictation, etc.)

- Gauge student interest in using similar computer-based applications to complete music theory exercises

- Assess the usability of the interfaces in terms of navigation, content layout and design
Plans for Variations3

- Extend Variations2 into an open-source tool usable by music libraries of various types
- Improve sustainability of the Variations2 metadata model

Other grants will cover:
- OMR
- Instructional use
- Development of more MMTT modules
Further reading


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Questions?

- For more information:
  - Variations2 web site
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- These presentation slides:
  <http://www.dlib.indiana.edu/~jenlrile/presentations/wic/v2.ppt>