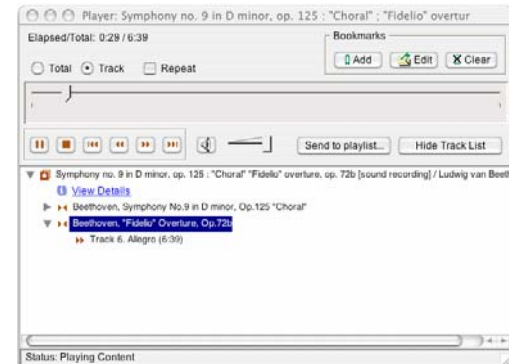
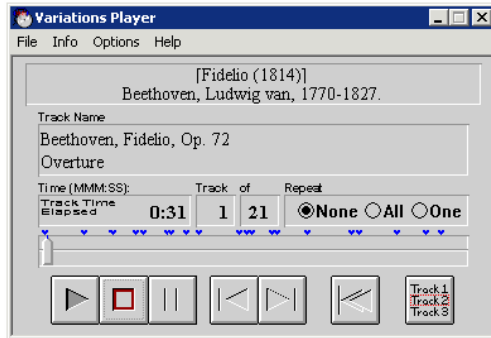


From Variations to Variations2



Phil Ponella
Jenn Riley
IU-Bloomington



What is Variations2?

- A digital library system that delivers near CD-quality digital audio to users at computers, via the network.
- Also includes a series of pedagogical tools that provides faculty members, students (and even casual listeners) with new ways to interact with music materials.



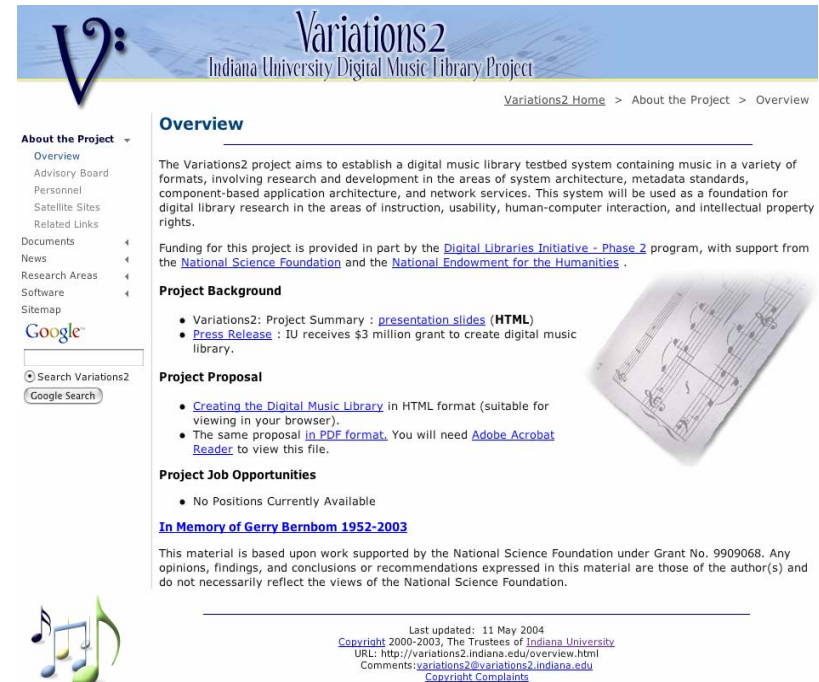
Who developed Variations2?

- Staff in the IU Digital Library Program, University Information Technology Services, (UITS), William and Gayle Cook Music Library, among others.
- With assistance from a \$3 Million Grant from the National Science Foundation and the National Endowment for the Humanities, awarded in September of 2000.



Project overview

- Establish a digital music library test-bed system supporting multiple formats: audio, video, score images, score notation.
- Develop multiple interfaces for specific user applications in the library and classroom.
- Conduct research in metadata, usability, copyright and networking.



The screenshot shows the 'Overview' page of the Variations2 project. The header features a large blue 'V' logo with a musical note and the text 'Variations2 Indiana University Digital Music Library Project'. A navigation breadcrumb trail reads 'Variations2 Home > About the Project > Overview'. The main content area is titled 'Overview' and contains the following sections:

- About the Project**: A sidebar menu with links to Overview, Advisory Board, Personnel, Satellite Sites, and Related Links.
- Documents**: A list of links for News, Research Areas, Software, and Sitemap.
- Search**: A Google search box with the text 'Search Variations2' and a 'Google Search' button.
- Overview**: A paragraph stating the project's aim to establish a digital music library testbed system.
- Funding**: A paragraph mentioning support from the National Science Foundation and the National Endowment for the Humanities.
- Project Background**: A list of links for 'Variations2: Project Summary' and a 'Press Release'.
- Project Proposal**: A list of links for 'Creating the Digital Music Library' and a PDF proposal.
- Project Job Opportunities**: A list item stating 'No Positions Currently Available'.
- In Memory of Gerry Bernbom 1952-2003**: A section with a paragraph of text.

At the bottom of the page, there is a small musical note icon, a copyright notice for 2000-2003, and contact information for the project.

<http://variations2.indiana.edu/>



What is different?



- Based on newer, current hardware (no more waiting 3-5 minutes for recordings to start playing).

- Old: an IBM 3494 with three IBM 3590E Magstar tape drives, attached to an IBM RS/6000 H80
- Each 3590E tape cartridge holds up to 20 GB of data.
- New: Apple's QuickTime Streaming Server running under Mac OS X on an Apple Xserve G5 server with two Apple Xserve RAID disk arrays attached.
- Total usable storage capacity of about 6 TB.
- Variations2, uses MP3 (MPEG-1 layer 3) audio files at 192 kilobits/second, which are about half the size of the MPEG-1 layer 2 files used in the original.



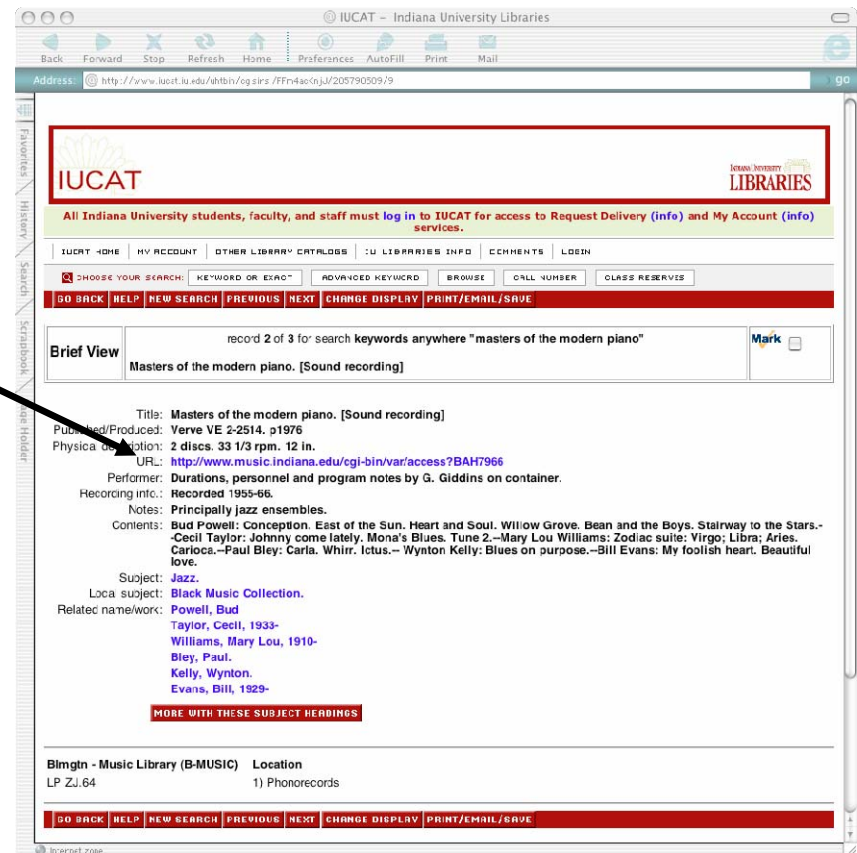
What else is different?

- Available on Macs as well as Windows PCs.
- Pedagogical tools:
 - Bookmarks
 - Playlists
 - Visual Analyses
 - Score Annotation Tools
 - “Drop the Needle” Listening Drills.
- Access Control. Variations2 can be installed on computers outside the Music Library.



What has stayed the same?

- Existing links in IUCAT, Music Library reserve lists, course web pages etc. will be redirected to Variations2 automatically.
- Will have the same reliability and stability as the original.



The screenshot shows a web browser window displaying the IUCAT website. The browser's address bar shows the URL: <http://www.iucst.iu.edu/uhbin/cgi/sirs/FFr4acnJ/205790509:9>. The website header includes the IUCAT logo and the text: "All Indiana University students, faculty, and staff must log in to IUCAT for access to Request Delivery (info) and My Account (info) services." Below the header is a navigation menu with options like "IUCAT HOME", "MY ACCOUNT", "OTHER LIBRARY CATALOGS", "LIBRARIES INFO", "COMMENTS", and "LOGIN". A search bar is present with the text "CHOOSE YOUR SEARCH: KEYWORD OR EFAQ" and buttons for "ADVANCED KEYWORD", "BROWSE", "CALL NUMBER", and "CLASS RESERVES". A red navigation bar contains buttons for "GO BACK", "HELP", "NEW SEARCH", "PREVIOUS", "NEXT", "CHANGE DISPLAY", and "PRINT/EMAIL/SAVE". The main content area shows a "Brief View" for a record titled "Masters of the modern piano. [Sound recording]". The record details include: Title: Masters of the modern piano. [Sound recording]; Published/Produced: Verve VE 2-2514. p1976; Physical description: 2 discs. 33 1/3 rpm. 12 in.; URL: <http://www.music.indiana.edu/cgi-bin/var/access?BAH7966>; Performer: Durations, personnel and program notes by G. Giddins on container; Recording info.: Recorded 1955-66; Notes: Principally jazz ensembles; Contents: Bud Powell: Conception. East of the Sun. Heart and Soul. Willow Grove. Bean and the Boys. Stairway to the Stars.- Cecil Taylor: Johnny come lately. Mona's Blues. Tune 2.-Mary Lou Williams: Zodiac suite: Virgo; Libra; Aries. Carrioca.-Paul Bley: Caria. Whirr. Itcus.- Wynton Kelly: Blues on purpose.-Bill Evans: My foolish heart. Beautiful love.; Subject: Jazz.; Local subject: Black Music Collection.; Related name/work: Powell, Bud; Taylor, Cecil, 1933-; Williams, Mary Lou, 1910-; Bley, Paul.; Kelly, Wynton.; Evans, Bill, 1929-; A red button labeled "MORE WITH THESE SUBJECT HEADINGS" is located below the record details. At the bottom of the page, there is a table with the following content:

Bingtn - Music Library (B-MUSIC)	Location
LP ZJ.64	1) Phonorecords

A red navigation bar at the bottom of the page contains buttons for "GO BACK", "HELP", "NEW SEARCH", "PREVIOUS", "NEXT", "CHANGE DISPLAY", and "PRINT/EMAIL/SAVE".



On with the demo...

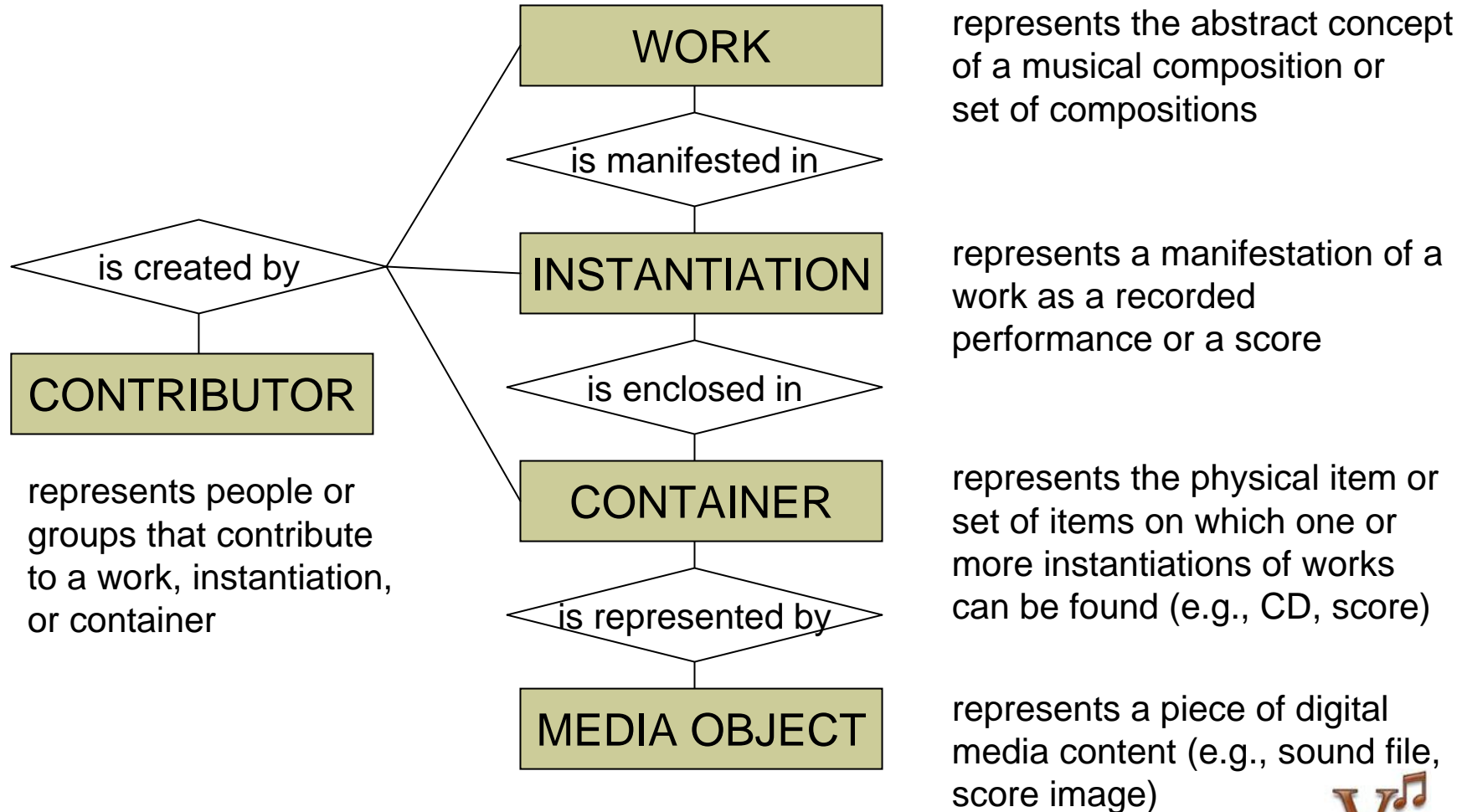


Variations2 Data Model

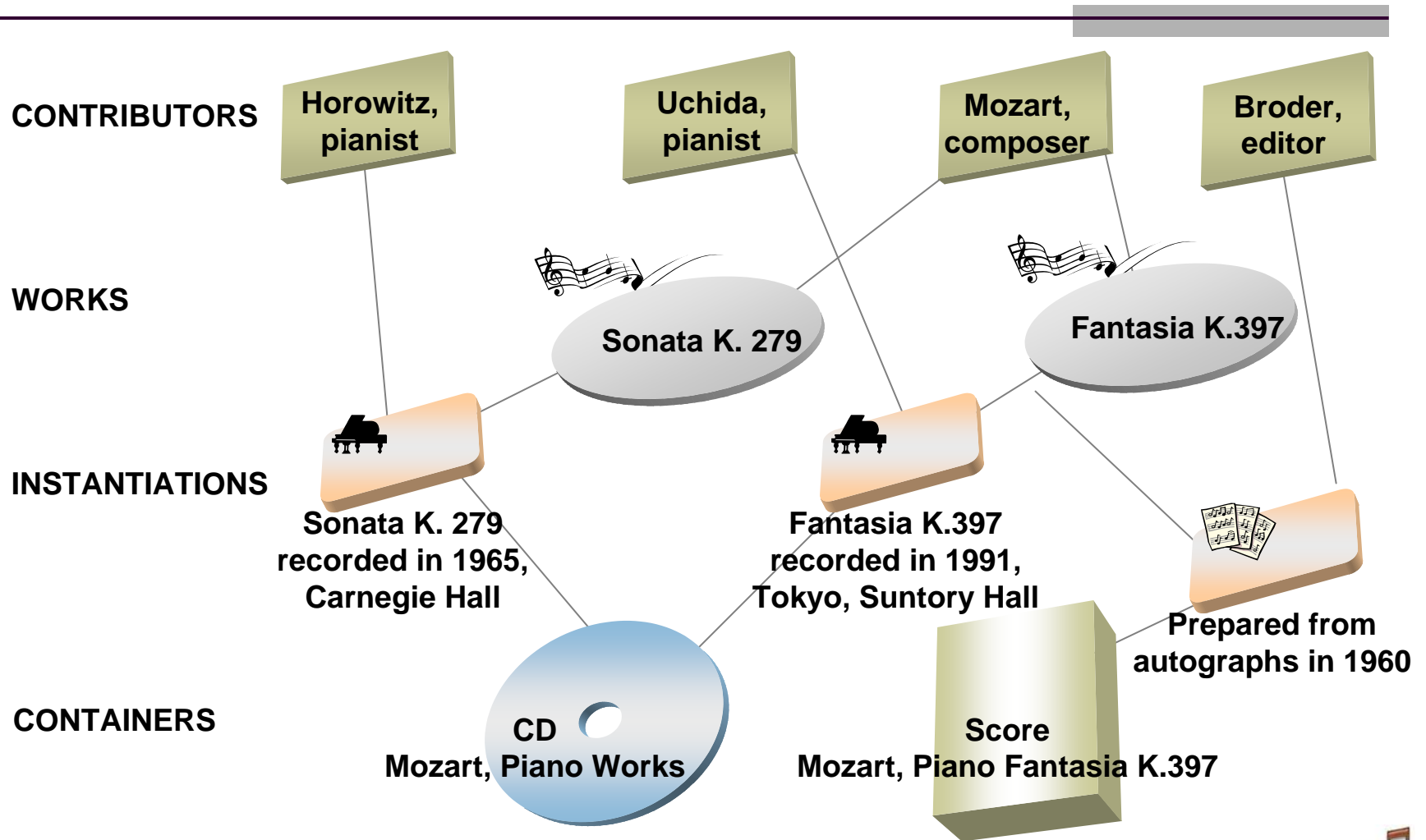
- Similar to FRBR from IFLA, but designed specifically for music
- Uses entity-relationship analysis to identify key concepts, properties, and relationships of musical objects
- Identifies, separates, and relates logical and physical layers of musical works and their physical manifestations
- In addition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



Data Model: Entities



Data Model: Example



V2 cataloging interface

- Contributor record
- Work record
 - Description
 - Contributors
 - Structure
- Container record
 - Description
 - Contributors
 - Structure
- Instantiation record, with Contributors
- Media Object record



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



Next steps for V2 data model

- Towards sustainability
 - Improved MARC mapping
 - Cooperative cataloging
 - Critical mass of work and creator records
- Improve work relationships



What's next?

■ Variations3?

■ Proposal submitted to IMLS

■ “Music Library in a box”

- “...create a digital music library and learning system that can be easily deployed at a wide range of college and university libraries with minimal technical support and minimal cost to the institutions.”
- Incorporate emerging subscription based services to provide consistent, user-friendly interface.
- Continue development by adapting the system to run on a wide variety of server operating systems and database platforms.



Required disclaimer

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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



Further reading

- Jon W. Dunn, Mary Wallace Davidson, Jan R. Holloway, and Gerald Bernbom. "The Variations and Variations2 Digital Music Library Projects at Indiana University." In *Digital Libraries: Policy, Planning and Practice*, Judith Andrews and Derek Law, eds., Ashgate Publishing, 2004, pp. 189-211.
- Mark Notess, Jenn Riley, and Harriette Hemmasi. *From Abstract to Virtual Entities: Implementation of Work-Based Searching in a Multimedia Digital Library*. ECDL 2004. Bath, UK, September 2004.
- Harriette Hemmasi. *Why Not MARC?* International Conference on Music Information Retrieval, Paris, France, October 13-17, 2002.



Questions?

- For more information:

- [Variations2 web site](#)

- pponella@indiana.edu, jenlrile@indiana.edu

- These presentation slides:

<<http://www.dlib.indiana.edu/~jenlrile/presentations/librariansDay2005/v2.ppt>>

