Variations2: IU Digital Music Library
Version 2.1
Usability Test Report :: Searching
December 22, 2003
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Executive Summary

After the release of version 2.1, a usability test was conducted with seven volunteers from the Intro to Music Bibliography class. This study was to determine the usability of the search interface and the functionality of the search results. The study also looked at the use of diacritics and multiple spellings in relation to searching.

The study's participants gave feedback throughout the testing in addition to filling out a satisfaction survey. The overall level of satisfaction in relation to searching in Variations2 was average. Users were prejudiced by their past use of IUCAT, Indiana University's OPAC, which often caused problems searching in Variations2. Users were hesitant to search too broadly for fear of getting too many unnecessary results. Though there was some frustration with this, users liked Variations2 much better than IUCAT because it was easier to use and provided more detailed information about a record. A few users stated that they would rather use Variations2 over IUCAT once the inventory of Variations2 increased.

Users liked the option to browse the entire collection using the browse tab and they liked the record views that gave them detailed information in one place and would help them save time. Users were excited to start using Variations2 and start exploring the other features they had heard about.

Overall, the issues raised by the study are minor and some of them are due to the learning curve associated with using new software. Some of the issues included overlooking the information buttons (I), the player starting on its own rather than allowing the user to start it when they are ready, the inability to search the record view with the Ctrl + f function, and the inability to narrow down the browse tab options or the Sort By options.

The study also revealed that diacritics and multiple spellings did not affect the progress of the users. Some users were conscious of them; however, they continued with their searching without them and felt successful without using them.

Recommendations for resolving these issues and lowering the learning curve are provided based on the results of the study and the suggestions of the participants.
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I. Purpose and Intent

The Variations2 IU Digital Music Library project aims to establish a digital music library testbed system containing music in a variety of formats. The current Variations system is used primarily by music students to listen to near CD-quality recordings online at computer workstations in the IU Cook Music Library.

Variations2 version 2.1 was released in August 2003 with a few minor adjustments including the addition of a browse tab, different view, listen, and details buttons, and the addition of corresponding colors with those buttons. The goal of this usability test was to evaluate the usability of the search interface and the presentation of the search results. The data gained from this study will help us better understand usage patterns for searching and will be used in making redesign recommendations.

II. Participants

The seven participants of this test were recruited from the graduate-level M539 Introduction to Music Bibliography class in the IU School of Music. During recruitment, volunteers signed up on a sheet that was passed around the class after a demonstration was given of the Variations2 software (excluding the search feature). Volunteers were then sent an email to coordinate test times.

Overall, the participants had similar backgrounds in music librarianship or music theory. Two of them were instrument majors. Six out of the seven participants were female and all were between the ages of 22-44 years old. Five out of the seven participants were native English speakers and all of their computer usage was at the high end of the scale. They ranked their computer skills as high with the PC and low with the Mac. Five participants said they used Variations once a week or more and two said once a month or less. Three of the participants have been using Variations for over two years, three have been using it within the last 1-2 years, and one participant only started using it within the last month. None of the participants had ever used Variations2.

Participants stated they normally use Variations for the following activities:

- class reserves for class preparation
- research
- personal listening
- in class use (M242)
- teaching
- patron instruction at Music Library reference desk

Table 1 shows the participants' gender, age, major, native language, computer usage per week, level of computer experience with both PC and Mac, their frequency of Variations use, and when they started using Variations.
Table 1: Participant Profiles

<table>
<thead>
<tr>
<th>#</th>
<th>Gender</th>
<th>Age</th>
<th>Major</th>
<th>Native Language</th>
<th>Computer Usage hrs/wk</th>
<th>Computer Experience</th>
<th>Variations Usage</th>
<th>Variations Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>28</td>
<td>MLS – Music Librarianship</td>
<td>English</td>
<td>11-20</td>
<td>5</td>
<td>3</td>
<td>Once a month or less</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>26</td>
<td>Strings – Cello</td>
<td>Mandarin</td>
<td>21 +</td>
<td>4</td>
<td>2</td>
<td>once a week</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>22</td>
<td>Musicology/ Library Science</td>
<td>English</td>
<td>21 +</td>
<td>4</td>
<td>4</td>
<td>once a month or less</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>23</td>
<td>Music Theory</td>
<td>English</td>
<td>11-20</td>
<td>4</td>
<td>2</td>
<td>more than 5 times a week</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>23</td>
<td>Music Theory</td>
<td>English</td>
<td>11-20</td>
<td>4</td>
<td>1</td>
<td>1-5 times a week</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>29</td>
<td>Music Theory</td>
<td>Hebrew</td>
<td>20</td>
<td>4</td>
<td>1</td>
<td>once a week</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>44</td>
<td>Harpsichord</td>
<td>English</td>
<td>21 +</td>
<td>4</td>
<td>1</td>
<td>once a week</td>
</tr>
</tbody>
</table>

III. Method

Each participant was greeted by the facilitator, given a short tour of the School of Library and Information Science (SLIS) Usability Lab, and seated at a PC with a screen resolution of 1024 by 768. The participant was then asked to read and sign the consent statement and complete a demographic survey. The facilitator then explained the procedures of the test as well as the purpose of the test. Each of the participants was asked to "think aloud" while they completed their tasks. These comments and actions were recorded with microphones and videotapes.

The tasks given to the participants utilized the four tabs of the search interface, Basic, Advanced, Keyword, and Browse as well as the details view. These tasks also examined the usage of diacritics and various spellings. The following eleven tasks were given to each participant in random order:

1. You need to research an opera, but you haven't chosen one yet. You decide to use Variations2 to help you. How many full operas does Variations2 have?

2. You are interested in listening to a recording that features the violin and harpsichord. How many recordings does Variations2 have that feature these?
3. For next week's assignment you need to find a recording that has a work performed in Spanish. Write the names of the recordings that have works performed in Spanish.

4. Find a work that was performed at Indiana University.

5. You are interested in listening to the Beatles. See if Variations2 has the Abbey Road album.

6. When was the first performance of Puccini's "La Bohème"?

7. You are interested in learning more about Variations2. You would like to know what is available in Variations2 by seeing which composers are represented. How many are there?

8. How many sonatas in Variations2 are in the key of A major?

9. Who is the publisher of a recording of Schubert's "Heidenröslein"? How many recordings does Variations2 have from this publisher?

10. For next week's quiz you need to listen to Tchaikovsky's "1812 Overture" and you want to know how long it will take you to listen to the entire piece. Find the length of Variation2's recording of Tchaikovsky's "1812 Overture".

11. Does Variations2 have more than one recording of "Frühlingsglaube" by Schubert?

After each participant felt she had completed all the tasks, she filled out a satisfaction questionnaire. She was then debriefed about her experience and about Variations2. The debriefing included questions about overall satisfaction, suggestions for improvement, and a series of recall questions about the search and the results that were displayed (Appendix A).

The recall questions were asked in order to find out the expectations of the results received in a search. Initially the users answered questions without looking at the application. After seeing what the participants recalled, the same search was performed using the application and each result listing was discussed.

After all comments and questions had been discussed, the facilitator thanked the participant and had her sign the receipt for the $15 Borders gift card. The facilitator then gave her the gift card, a copy of the consent form, a Variations2 handout to assist with future uses, and walked her out of the lab.

After all the tests were completed, the session logs were analyzed for the following criteria:

- The number of total searches as well as the individual basic, advanced, and keyword searches.
- The number of total browses and each individual browse category (creators, performers, works, and containers).
- The number of times a user clicked down into the search results and how many times they did not drill down into the search results
- The number of times a user opened either the media player or the score viewer
- The number of times a user opened the details/record view window.
- The number of times the clear button was pressed.
- The number of times the stop button on the player was pressed.
- The number of times the search was clicked twice in succession and the seconds between each click.
- The number of common errors made.

(In addition to the various results used throughout the report, the complete set of results are listed in Appendix D.)

**IV. Findings**

Overall, the participants were very pleased with Variations2 and expressed interest in using it in the future. Users were articulate in expressing thoughts and concerns for improving Variations2. They liked Variations2 much better than IUCAT but they often used their past experiences with IUCAT while searching in Variations2. This proved to be unsuccessful at times; for example, U6 tried to be as specific as possible in her searching to avoid getting numerous unnecessary results as she would have in IUCAT. In Variations2 this resulted in her not getting any results, yet she had reservations about broadening her search because she was afraid she was going to get too many unrelated results.

Users were also impressed with the browse option. U5 commented, "This is cool." after clicking on the browse tab. Even after realizing that having more records cataloged would make an extensive list to "browse" through they still felt this was a helpful feature. A few users made suggestions to add different sorting options for when the inventory is increased in the future.

The extensive detailed information about the recordings was well received. Many users were pleased to see all of this information in Variations2 realizing they wouldn't have to seek multiple sources for that information. When U4 stumbled across it, she exclaimed, "Wow! That's neat."

On the whole, users completed a majority of their tasks successfully. Out of the eleven tasks and seven users, a total of 77 tasks were calculated with a success rate of 74%.

Individually, tasks 3 and 7 scored below average with only three participants completing them successfully. In task 3 users didn't spend the time to fully go through the entire record view in search of performances in Spanish and the ability to search on a page (Ctrl + f) would have helped them in this task. Users had a hard time completing task 7 because of the combined roles in the "creator" listing. Though there is a sort by role option, most users did not notice this and claimed that all the creators listed were composers.

Tasks 1, 4 and 6 score slightly above average with four of the seven participants completing them successfully. During task 1, users had a difficult time determining if the results listed full operas or excerpts or both. There was no indication in the results and users often used their own background knowledge to determine the answer. Tasks 4 and 6 were not completed successfully due to either the participants' inability to find the record view (8) or because of their reluctance to read the entire record view to gain the necessary information.

Tasks 8 and 9 scored better with only one and two participants (respectively) not completing the tasks successfully. Though task 8 was pretty straightforward, users did spend time double checking the results that were initially displayed. The fields used to search for sonatas varied between users. In task 9 users spent most of their time determining how to search for a specific publisher.
Tasks 2, 5, 10, and 11 all had 100% success. Task 2 caused users to look at each of the results listed because not all of the recordings that were returned in the results list featured just the violin and harpsichord. In task 5 some users mistakenly typed Beatles in the Creator field which resulted in no results and forced them to find other ways of searching or realizing the Beatles were performers. Task 10 did not cause any user to be concerned over variable spellings of Tchaikovsky but did force them to look at a variant work name that included the 1812 Overture. After that, users had no trouble using the player to determine the length of the recording. Task 11 was pretty basic for all users and only a few expressed curiosities about the use of diacritics. All the users performed the search without them.

Table 2 shows each task and its completion result per participant.

Table 2: Task Completion Results (n=7)

<table>
<thead>
<tr>
<th>Task</th>
<th>Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>●●●●</td>
</tr>
<tr>
<td>2</td>
<td>●●●●●●●</td>
</tr>
<tr>
<td>3</td>
<td>●●●</td>
</tr>
<tr>
<td>4</td>
<td>●●●</td>
</tr>
<tr>
<td>5</td>
<td>●●●●●●●</td>
</tr>
<tr>
<td>6</td>
<td>●●●</td>
</tr>
<tr>
<td>7</td>
<td>●●●</td>
</tr>
<tr>
<td>8</td>
<td>●●●●●●●</td>
</tr>
<tr>
<td>9</td>
<td>●●●●</td>
</tr>
<tr>
<td>10</td>
<td>●●●●●●●</td>
</tr>
<tr>
<td>11</td>
<td>●●●●●●●</td>
</tr>
</tbody>
</table>

● = Tasks completed successfully

Satisfaction Ratings
The satisfaction survey was identical to that used in previous usability tests. It is an eleven question survey that asks users to rate their experience with Variations2 by circling a number on a 1-7 scale. Positive adjectives are at the high end of the scale while negative adjectives are at the low end. A higher mean score would indicate a higher satisfaction rating overall. Calculated are the mean (average), median (middle score), and mode (most frequent) as well as the individual scores marked with a circle in the corresponding column shown in Table 3.
<table>
<thead>
<tr>
<th>Questions</th>
<th>Ratings</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1. Overall, I found Variations2:</td>
<td>Terrible</td>
<td>Wonderful</td>
</tr>
<tr>
<td></td>
<td>Easy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frustrating</td>
<td>Satisfying</td>
</tr>
<tr>
<td></td>
<td>Dull</td>
<td>Stimulating</td>
</tr>
<tr>
<td></td>
<td>Slow</td>
<td>Fast</td>
</tr>
<tr>
<td>2. Navigating Variations2 and its components was:</td>
<td>Difficult</td>
<td>Easy</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Always</td>
</tr>
<tr>
<td>3. Tasks could be performed in a straight-forward manner:</td>
<td>Never</td>
<td>Always</td>
</tr>
<tr>
<td>4. My location within Variations2 at any given moment was:</td>
<td>Never Apparent</td>
<td>Always Apparent</td>
</tr>
<tr>
<td></td>
<td>Confusing</td>
<td>Clear</td>
</tr>
<tr>
<td>5. Characters (letters, type, fonts) in Variations2 are:</td>
<td>Hard to read</td>
<td>Easy to read</td>
</tr>
<tr>
<td>6. Organization of information in Variations2 is:</td>
<td>Confusing</td>
<td>Clear</td>
</tr>
<tr>
<td>7. The number of screens and/or windows open at any one time in Variations2 is:</td>
<td>Difficult to deal with</td>
<td>Easy to manage</td>
</tr>
</tbody>
</table>

(See Appendix B for additional comments provided by the participants in the satisfaction survey.)

Due to the nature of the tasks and the specific testing goals of the usability study, this satisfaction survey doesn't measure the overall software quality, but instead measures the limited areas of the software as
defined by the tasks. This is apparent in survey questions 4 and 7 which were ranked the high because most of the tasks took place within a few windows. Other tasks were more challenging which resulted in users stating high frustration (question 1, part 3) and confusion performing task in a straight-forward manner (question 3).

Task Outcomes
Throughout the seven tests there were a few common issues that kept surfacing. A few of these issues were easily overcome once users became familiar with the interface and explored their options further. Yet, some participants did not figure it out and ended up having difficulties with their search results. These issues are part of initial learning curve necessary when using new software but, some of these could be modified to lessen the curve.

Most of the users did not see the "Searching..." text that displays when the software is retrieving the search results. After pressing enter after her search, U3 waited about 3 seconds and used the mouse to click the search button because she didn't see that the software was doing anything. U4 commented that she is used to looking in the upper right corner for activity; however, she says that this is a product of habit brought on by using the internet. Five out of the seven participants did not see the "Searching..." text immediately though, a few of them commented that once they saw it they knew where to look. The session logs indicated a total of 10 different times where the search button was clicked a second time with an average of 6.7 seconds between each click.

Many users made errors (21 total) in their searches because they left past search data in other fields. The results screen indicating what they had searched for was helpful in letting them know what had happened. A few of the users wanted a way to clear the fields and finally saw the clear button – the session logs indicated the clear button was pressed a total of 31 times. After inquiring about this, users said it was a helpful feature and was in a good location on the window. They missed it because they were not spending a normal amount of time looking over the interface as they usually would.

Out of the seven participants, two users were interested in the "Select All" option. U5 asked about it and after it was explained, she was still unsure how or why she would use it. U1 tried the select all to see what it would do, "I'll hit the select all...What does that do? Oh, here it is once I hit the "all" thing it came up and I found it." Though he had a positive experience with it, U1 never used the "Select All" feature again.

One participant tried numerous times to right click on text she had highlighted in the search results in order to paste them in the search fields. She was frustrated that she had to re-type the text. She finally found the copy option in the pull-down menus, but she never used them to paste her selection.

Due to the nature of the tasks, users were searching for specific data within the details records and often tried to utilize the Control + f option to search on the page. The lack of this feature forced them to scan the entire record and they often did not find the information they were seeking.

Many users seemed confused by the "Sort by" drop down option. When asked to explain what they thought it was meant to do, they explained correctly yet, during their searches many users often looked in the "Sort by" menu to help them narrow the search. When they were talking about it, many wished there were more options in the "Sort by" menu like genre, instrumentation, musical form, and style.
The biggest problem that every user had was finding the details record. All of the participants would click on the blue underlined text in anticipation of getting more information but the player was launched and the piece started playing instead. All of the users immediately stopped the piece from playing each time they click the blue link and continued to search for more information. Most users eventually saw the "View Details" link in the player and used that every time they wanted more information (while continuing to stop the music each time – for a total of 14 specific clicks). Most of them did not see the blue I (i) at the end of the link. U7 thought that was just an extension of the blue text and didn't bother to explore further. U3 did see the blue I (i) but kept wanting to click on the text instead, "Oh! I keep clicking on that. I should click on the little i." When asked why they immediately stopped the music from playing, all of them said they wanted to get more information about the piece first before determining if they wanted to listen to it. They wanted to be in control of when the music started playing. They assumed that is the reason for the "Listen" button.

Debriefing Recall Outcomes
Overall, users anticipated search results to be much wider than they are, but all were happy with the actual multiple levels of specificity. For the first question, all of the users initially expected the results to be much more extensive, for example in a basic search for "Bach" in the creator field, U1 said he expected all the works written by all the Bachs and U5 expected that all recordings or scores by any Bach would be displayed. After performing the search together, all of the users stated that they forgot about the broader results where it lists all of the instances of the string matching b-a-c-h (which includes creators such as Burt Bacharach and Harry Bache Smith). Although they initially overlooked this in their recall, all stated that this initial result listing was good and liked being able to narrow it down from there. The users then expected that after selecting a creator from the results, J.S. Bach, for example, all of his recordings would appear. Again, they were surprised to see the broader results which listed the works. U3 stated that this way is much more useful and that she was afraid that all of the recordings would be listed and it would be too much. She liked that the works came up first. U7 stated that having the works listed first was much better. After they saw the works listings, they knew that the recordings were next and that clicking on a recording title would bring up the player (though they wished that it would bring up more information first and then the option to play the recording).

V. Recommendations

The following are the issues and recommended design changes which are ranked in order by importance. These recommendations come from the issues during the individual tasks and the information and suggestions gathered in the debriefing questions (See Appendix C). The same rankings are used from the previous usability tests and are as follows:

- **High** – Issue prevents users from making progress or led to severe mistakes.
- **Medium** – Issue causes confusion, inefficiency, or minor mistakes.
- **Low** – Issue causes slight amounts of confusion or dissatisfaction.
- **Bug** – System was not functioning properly or was an external issue.
1. **Issue:** As users clicked deeper into the search results to a recording, users expected the blue underlined text to give more information - not to start the recording. They expected that pressing the "Listen" button would start the recording. Because the tasks in this test required users to retrieve information and not listen to a recording, this resulted in preventing users from making progress in looking for details about a recording. Users' experiences from the web and IUCAT influenced them in this expectation that clicking on a blue underlined link would retrieve more information.

**Recommendation:** Change the link to open the detail record instead of the player.

**Alternative Recommendation:** Display the details within the search window.
(see Appendix E - Figure 1)

**Alternative Recommendation:** Display the details in the search window and launch the player window but allow the user to press the play button when they are ready to listen.

2. **Issue:** In relation to the previous issue, the (blue i) was not easily seen and often blended into the text causing users to not have access to the information they were seeking. Users who saw the icon assumed since the icon and the link were the same color it acted as the same link click.

**Recommendation:** Put a consistent 15 pixel space between the end of the line of text and the so users can see their cursor change as they roll over the text and the button. Add the same drop shadow as the other buttons to the so it looks more clickable.
(see Appendix E - Figure 2)

**Alternative Recommendation:** Change the color of the so it doesn't blend in with the linked text. After reviewing the current colors in the application, I suggest a light purple (CC33FF).
(see Appendix E – Figure 3)

**Alternative Recommendation:** Move the to the front of the underlined text in the results list.
(see Appendix E – Figure 4)

**Alternative Recommendation:** Remove the's and add a new button called "Info". This would open a record view window and allow the user to choose what information they needed (work, recording, composer, performer, etc.)
(see Appendix E – Figure 5)

3. **Issue:** Users are used to having the ability to search a screen for the specific information they are seeking without reading the entire page – currently Variations2 has no way to quickly find info without reading/scanning the entire record.

**Recommendation:** Add the Ctrl + f option to allow users to search the window.
Medium

4. **Issue**: Most users perform searches on the web and look to an animated icon that indicates the browser is working or "thinking" – some users were unsure when Variations2 was searching because nothing was moving and some did not see the static "Searching..." text that was displayed.

   **Recommendation**: Follow the web's example by offering an animated GIF to indicate activity. This should be placed either in the upper right corner or where the current "Searching..." text is located.

Low

5. **Issue**: Many times links that are not as intuitive include tool tips to help describe what function they perform. The "Select All" option was ignored and therefore not utilized because users were not sure of its purpose.

   **Recommendation**: Add a tool tip to this link to explain that it will select all of the current results.

   **Alternative Recommendation**: Change the link text to read "Show All" and append Works or Recordings/Scores to that text according to the level at that time, for example a search for creator=bach would have a "Show All Works" link.

6. **Issue**: When looking at many results, users liked the option to narrow the list by specific criteria. Browsing the collection was useful but users wanted to be able to restrict the browse.

   **Recommendation**: Offer more filters specific to the area chosen (Creator, Works, Performer, Recording/Score) (see Appendix E - Figure 6).

7. **Issue**: Users wanted to be able to narrow their search results more specifically than the current options given in the "Sort by" drop down menu.

   **Recommendation**: Offer more choices in the drop down menu depending on the given results.

8. **Issue**: PC users are used to using their right mouse button to click for more options including cut, copy, and paste.

   **Recommendation**: Add the cut, copy, and paste functions to the right-click menus.

An additional option for some of these issues like the "Searching..." text, the "Select All" link and the "Sort by" confusion could be to place explanatory text in the results area of the search window that is only available when the window is first opened. Daily tips and helpful hints could also fill this window each time it's opened. (see Appendix E - Figure 7).
VI. Future Testing

Due to the nature of the tasks, not all of the search features were tested. It is recommended that future testing includes the following:

- Any redesign issues stated in this report
- The "Select All" function
- Using the $I$'s in the other fields listed below a recording or score
- Usage of the listen/view buttons
Appendix A

Usability Study: **Demographic Survey**
Client: Variations2 version 2.1

U:

1. Are you Male / Female? (Circle one)

2. What is your major? (e.g. composition, voice, piano):

_________________________________________________________________

3. What is your age? _____

4. What is your native language? __________________

5. How many hours per week do you spend using a computer?
   [ ____ 0-5] [ ____ 6-10] [ ____ 11-20] [ ____ 21 or more]

6. Rate your computer experience on the following systems by circling 1-5 below:
   a. PC: Novice 1 2 3 4 5 Expert
   b. Macintosh: Novice 1 2 3 4 5 Expert

7. Approximately how often do you use Variations?
   ____ once a month or less
   ____ once every two weeks
   ____ once a week
   ____ 1-5 times a week
   ____ more than 5 times a week

8. When did you begin using Variations?  Mark the most accurate choice.
   ____ within the last month
   ____ within the last year
   ____ within the last two years
   ____ more than two years ago

9. What activities do you mainly use Variations for? (e.g. listening to a class reserve list, preparing for recital, personal listening, etc.)

_____________________________________________________________________

11. Have you participated in any prior Variations2 usability sessions? (circle one) YES NO

12. Have you used Variations2 before? (circle one) YES NO
Usability Study: **Post Test Survey**  
Client: Variations2 version 2.1  

For each question below, circle a number from 1-7. The number should best represent your feelings about the Variations2 experience that you described in Section II. Feel free to write additional comments in the space provided below.

1. **Overall, I found Variations2:**

<table>
<thead>
<tr>
<th>Terrible</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Wonderful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Easy</td>
</tr>
<tr>
<td>Frustrating</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Satisfying</td>
</tr>
<tr>
<td>Dull</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Stimulating</td>
</tr>
<tr>
<td>Slow</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Fast</td>
</tr>
</tbody>
</table>

2. **Navigating Variations2 and its components was:**

<table>
<thead>
<tr>
<th>Difficult</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Easy</th>
</tr>
</thead>
</table>

3. **Tasks could be performed in a straight-forward manner:**

<table>
<thead>
<tr>
<th>Never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Always</th>
</tr>
</thead>
</table>

4. **My location within Variations2 at any given moment was:**

<table>
<thead>
<tr>
<th>Never apparent</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Always apparent</th>
</tr>
</thead>
</table>

5. **Characters (letters, type, fonts) in Variations2 are:**

<table>
<thead>
<tr>
<th>Hard to read</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Easy to read</th>
</tr>
</thead>
</table>

6. **Organization of information in Variations2 is:**

<table>
<thead>
<tr>
<th>Confusing</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Clear</th>
</tr>
</thead>
</table>

7. **The number of screens and/or windows open at any one time in Variations2 is:**

<table>
<thead>
<tr>
<th>Difficult to deal with</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Easy to manage</th>
</tr>
</thead>
</table>

**Additional Comments (use back of page if you need more space):**

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
You have now finished the tasks for this usability session. Now I would like to ask you a few questions about your experience.

1. So, how do you feel?  
   How do you feel about this?

2. What is your overall reaction to the system?

3. Ask a series of recall questions about search (i.e., without looking at the app):
   a. If, on the basic search tab, you type “bach” in the “creator” field and press the search button, what would Variations2 show you in the listed results?
   b. Depending on the answer to the above, continue the line of questioning, e.g.: OK, so it shows you all the bachs. If you were to click on one of them, say J.S. Bach, what will Variations2 show in the results?
   c. Depending on the answer to the above, continue the line of questioning, e.g.: OK, so it shows you all the works by J.S. Bach. If you were to click on one of them, say “Brandenburg Concerto #3”, what will Variations2 show in the results?
   d. continue until you get to the media player/viewer invocation.

   If the participant gets it wrong (e.g., assuming that searching on “bach” displays the works of J.S. Bach or displays recordings by him), that’s fine—just continue the line of questioning.

4. After seeing what participants recall of their mental model, then try it together, actually using V2:
   a. Clear the search panel and have them do the search. At each phase, before they act, clarify what they’re expecting to see & why (now, looking at it, their expectation may differ from their recalled one above).
   b. After they act, ask, “Is this what you expected to see?” Be sure it really is. Ask, “what is it about what you’re looking at that lets you know what you’re seeing?” or something like that. If they got an unexpected result, be sure to clarify what they expected and whether they are OK with the real result—if they think it makes more sense than what they expected.

5. After working through the process with Variations2, review any critical incidents you observed that were related to this disambiguation process.
6. What was the most frustrating? Hardest to use?

7. What did you like the best? What was the easiest to use?

8. What did you like the least?

9. Are there any functions that you would add to the Variations2 system?

10. I noticed that at one point you said "   
 Could you tell me what was going on there?

11. What other suggestions do you have for the system?

- Comments on the media player, details viewer:

- Comments on the search interface: (Did it make sense? What do you think it should be like? How do you think it should work? Did you understand the search term concept? Work, Recording, Instantiations?)

Thank you for participating!
Usability Study: **Gift Card Receipt**
Client: Variations2 version 2.1

By signing below, I certify that I participated in a usability test for the Variations2 Indiana University Digital Music Library project in November/December 2003, and received a Border's Books and Music gift card in the amount of $15 in exchange for my participation.

Signed: ______________________________

Print name: _________________________
Appendix B

Additional Comments on Satisfaction Survey

U1 – Complicated requests for information were harder to find if there weren't fields that were labeled for that data element.

U2 – I wonder if there is one more choice for composers that Variations2 has in the Browse section.

U3 – I didn't notice the information buttons at first, but when I did, they were useful.

U4 – Could use ctrl + f type search in details. Need some kind of icon to represent the application is searching. The 'etc.' listing under works is a little irritating. If you can access every recording you don't need but the one you do need is elsewhere.

U5 – I think a "Sort by Date" option could be useful, especially when there are more scores and recordings to choose from. I liked all the information in the button. It wasn't apparent immediately, however, that that was the function of the button. I expected that when I clicked the link to the piece information would appear and a player would open. The clicking to play took me by surprise. I am not clear on what is the purpose of the subject search. I really like the browse feature.

U6 – I would expect to get more options to limit/filter information (for instance – browse a composer by genre; browse creators by composer/role etc.)
Appendix C

Debriefing Information

----- U1 -----

Overall Reaction:
- Not the most user friendly experience
- Wasn't easy to find what to put where
- Not enough choices
- Labeling was clear, but work title was unclear

Frustrations:
- Wants more limits – similar to media format (for example: Languages)
- Browse is difficult – would like a box to type in and results would be listed by subject

Best Feature:
- Basic Tab because it gave me what I needed to find

Suggestions:
- Would like more options to sort by
- Would be nice to be able to sort by publisher and have a link from the publisher in the results (like all the other fields)

Additional Comments:
- I didn't click on the orange button because I didn't want to listen to it
- Blue text usually gives more information – I would click that and expect more information about a piece – I didn't want it to start playing
- I expected that the text would give different information than the 🎵

----- U2 -----

Overall Reaction:
- This is good – better sound than Variations

Frustrations:
- The broad results were

Best Features:
- Multiple recording to compare
- Easy to tell difference between recordings and scores
- Score quality is good

Additional Comments:
- Use advanced search more often because of personal experience and searches are too narrow in Variations2
----- U3 -----

Overall Reaction:
- Felt more comfortable as I went along – I found the clear and knew to click the blue text
- In general, searches give no feedback if you are in the right area – you never know what is really there compared to what your results are
- I like the next to each field – it was hard to see at first maybe because of the color or because it was at the end

Frustrations:
- Search for languages
- Would like publisher to be clickable

Best Feature:
- Liked the browse tab
- Liked being able to search by key

Suggestions:
- Would like to see something moving when it's searching and possibly in the upper right hand corner
- Something that initially tells you "For more information click on"
- Would like to be able to narrow the browse tab by just displaying what I select like all creators who were composers and alphabetically
- Would like to be able to search by genre and instrument – but this might usually be under subject heading

----- U4 -----

Frustrations:
- Can't search in details window
- Would like an active icon (moving) to show when it's searching

Best Feature:
- The advanced search options

Suggestions:
- In the browse tab – being able to jump to a spot alphabetically
- Boolean search capabilities in the subject heading field and other fields too

Additional Comments:
- Confusion when to use the "Sort By" option
- Hard time getting used to clicking the
- Didn't know you could click on the listen button
----- U5 -----
Frustrations:
- Confused by subject heading – had different expectations

Best Feature:
- The blue information buttons (1)
- The browse tab

Suggestions:
- Option to sort chronologically
- Ability to browse by subject heading
- Want to be able to see the tracks and give the option to play

Additional Comments:
- The listen button is redundant
- Since the 1 is the same color – it looks like one click selects the whole line
- Clear and Back buttons are in a good place – just have to get used to them
- Browse needs more options/limits
- Like using the advanced tab because of IUCAT
- Like all the information in the details window – didn't realize that you could "Jump to Contents"

----- U6 -----
Frustrations:
- Blue link is confusing
- Prefer to have information first and then the option to decide if I want to listen to it

Additional Comments:
- IUCAT may have influenced me in my searching – I expected I would get too many results
- Didn't see the "Sort By" option
- Would like an option to narrow the browse before browsing
- Thought the Key dropdown had something to do with Keyword searching – would like it to say key and mode or tonality and mode
- Didn't notice the "Searching..." icon, but wasn't concerned

----- U7 -----
Additional Comments:
- There is a learning curve with getting the 1
- Would like to be able to play recording when ready
- Never saw "Searching..." – it needs to be more attention getting – at least the first time
- Because of IUCAT, I don't often look at empty search results
- Help was useful
## Appendix D

**Session Logs – Totals**

### Total Searches:

<table>
<thead>
<tr>
<th>Type of Search</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic searches</td>
<td>56</td>
</tr>
<tr>
<td>Advanced searches</td>
<td>127</td>
</tr>
<tr>
<td>Keyword searches</td>
<td>95</td>
</tr>
</tbody>
</table>

**Total:** 278 searches

### Total Browses:

<table>
<thead>
<tr>
<th>Type of Browse</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creators selection</td>
<td>13</td>
</tr>
<tr>
<td>Performers selection</td>
<td>5</td>
</tr>
<tr>
<td>Works selection</td>
<td>12</td>
</tr>
<tr>
<td>Containers selection</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total:** 32 searches

### Additional Statistics:

- Number of times users did not click on the results of the search: 223
- Number of times users clicked on a result from the search: 136
- Number of times users clicked down through the results and opened either the player or score: 96
- Number of times users clicked the "View Details" button: 100
- Number of times users clicked the "Clear" button: 31
- Number of times users did not click the "Clear" button and left past search data in other fields: 21
- Number of times users clicked the "Stop" button on the player to prevent the audio from playing: 14
- Number of times users clicked the "Search" button twice before the results were displayed: 10
- The seconds between consecutive "Search" button clicks:
  - Mean: 6.7 seconds
  - Medium: 6
  - Mode: 3
- Number of spelling errors made: 3
- Number of times users typed "Beatles" in the Creator field and not getting the results wanted: 4
Appendix E

Figure 1: Details in the Search Window Alternative Recommendation

Record View for Forelle (Song)

From Score: Gesänge für eine Singstimme mit Klavierbegleitung
Composer: Schubert, Franz, 1797–1828
Publisher: C. F. Peters

Forelle (Song)

Composed by
Schubert, Franz

Other Creators
Schubart, Christian Friedrich Daniel (Lyricist/Poet/Text Writer)

Key
Db Major

Instrumentation
Voice--unspecified
Figure 2: Added Space and Drop Shadow Recommendation

![Variations2 Search Window 1](image)

<table>
<thead>
<tr>
<th>Work Title</th>
<th>View</th>
<th>Listen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forelle (Song)</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>From Score: Schöngelage für eine Singstimme mit Klavierbegleitung</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Composer: Schubert, Franz 1797-1828</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Publisher: C.F. Peters</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Title</th>
<th>View</th>
<th>Listen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forelle (Song)</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>From Recording: Marian Anderson [sound recording]: rare and unpublished recordings, 1935-1952</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Composer: Schubert, Franz 1797-1828</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Performer: Anderson, Marian 1897-1953</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Publisher: VAI Audio</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Title</th>
<th>View</th>
<th>Listen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forelle (Song)</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>From Recording: Schubert and Brhns Lieder [sound recording]</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Composer: Schubert, Franz 1797-1828</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Performer: Anderson, Marian 1897-1953</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Publisher: RCA Red Seal</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Title</th>
<th>View</th>
<th>Listen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forelle (Song)</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>From Recording: Schubert’s Album [sound recording]</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Composer: Schubert, Franz 1797-1828</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Performer: Fleming, Renés 1959-</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
<tr>
<td>Publisher: London</td>
<td><img src="image" alt="View" /></td>
<td><img src="image" alt="Listen" /></td>
</tr>
</tbody>
</table>
Figure 3: New Color Recommendation

4 occurrences were found with the Work Title matching Forelle (Song) where:
- the Creator matched Schubert, Franz

1. Work Title: Forelle (Song)  
   From Score: Gesänge für eine Singstimme mit Klavierbegleitung  
   Composer: Schubert, Franz 1797-1838  
   Publisher: C.F. Peters

2. Work Title: Forelle (Song)  
   From Recording: Marian Anderson [sound recording]: rare and unpublished recordings, 1935-1952  
   Composer: Schubert, Franz 1797-1828  
   Performer: Anderson, Marian 1897-1958  
   Publisher: VAI Audio

3. Work Title: Forelle (Song)  
   From Recording: Schubert and Brahms Lieder [sound recording]  
   Composer: Schubert, Franz 1797-1828  
   Performer: Anderson, Marian 1897-1958  
   Publisher: RCA Red Seal

4. Work Title: Forelle (Song)  
   From Recording: The Schubert album [sound recording]  
   Composer: Schubert, Franz 1797-1838  
   Performer: Fleming, René 1950-  
   Publisher: London
Figure 4: To the Front of the Results Recommendation

![Variations2 Search Window 1](image)

4 occurrences were found with the Work Title matching Forelle (Song) where:
- the Creator matched Schubert, Franz

1. Work Title: Forelle (Song)
   - From Score: Gesänge für eine Singstimme mit Klavierbegleitung
   - Composer: Schubert, Franz 1797-1828
   - Publisher: C.F. Peters

2. Work Title: Forelle (Song)
   - Composer: Schubert, Franz 1797-1828
   - Performer: Anderson, Marian 1897-1958 ; Rupp, Franz 1901-1992
   - Publisher: VAI Audio

3. Work Title: Forelle (Song)
   - From Recording: Schubert and Brahms Lieder [sound recording]
   - Composer: Schubert, Franz 1797-1828
   - Performer: Anderson, Marian 1897-1958 ; Rupp, Franz 1901-1992
   - Publisher: RCA Red Seal

4. Work Title: Forelle (Song)
   - From Recording: The Schubert album [sound recording]
   - Composer: Schubert, Franz 1797-1828
   - Performer: Fleming, Renée 1950- ; Eichenbach, Christoph 1540-1594
   - Publisher: London
Figure 5: Info Button Alternative Recommendation

4 occurrences were found with the Work Title matching Forelle (Song) where:
- the Creator matched Schubert, Franz

1. Work Title: Forelle (Song)
   From Score: Gesänge für eine Singstimme mit Klavierbegleitung
   Composer: Schubert, Franz 1797-1828
   Publisher: C.F. Peters

2. Work Title: Forelle (Song)
   From Recording: Marian Anderson [sound recording]: rare and unpublished recordings, 1935-1952
   Composer: Schubert, Franz 1797-1828
   Performer: Anderson, Marian 1897-1958; Rupp, Franz 1901-1992
   Publisher: VAI Audio

3. Work Title: Forelle (Song)
   From Recording: Schubert and Brahms Lieder [sound recording]
   Composer: Schubert, Franz 1797-1828
   Performer: Anderson, Marian 1897-1958; Rupp, Franz 1901-1992
   Publisher: RCA Red Seal

4. Work Title: Forelle (Song)
   From Recording: The Schubert Album [sound recording]
   Composer: Schubert, Franz 1797-1828
   Performer: Fleming, Renés 1950-; Echenbach, Christoph 1540-
   Publisher: London
Figure 6: Two Browse Windows Recommendation
Figure 7: Main Window Recommendation

Fill in as many of the query fields above as you wish, then click Search.

In the search results, click the button to see more details.

Use the Sort By: and Show: drop down menus to arrange the results of your search.

Use the tutorials to learn more about Variations2.

Visit the User Guide to get more information and helpful tips on Variations2.

Current Variations2 content status: 219 recordings and 17 scores.