Digital Music Library: Work Plan / Deliverables: Eric Isaacson, Music Theory Instruction

Updated: January 4, 2001

Academic Year 00-01

1. Develop a series of scenarios describing a variety of potential uses by a variety of potential users

Timeline: December 2000-January 2001

Activity: To assist in identifying user groups, product specifications, metadata needs, and copyright and networking issues, we will develop a series of scenarios that represent a range of realistic applications for the technologies we hope to develop as part of the project.

Responsible parties: Isaacson (representing music faculty and students in music classes at IUB), Davidson (representing library patrons), Fern (representing traditional and distributed education courses at IUPUI)

Output
• A white paper (yes?) listing the scenarios. (To be submitted to Andy Dillon)

Deliverable Date: January 15, 2001

2. Develop needs analysis for lesson authoring system

Timeline: January 2000-March 2001

Activity: In order to make MMTT as widely usable as possible, we need to determine what features are needed in the final MMTT application, and what priority is assigned to them. We will observe and/or videotape classroom teaching by faculty and graduate students teaching classes that currently use score or audio library resources to observe directly the kinds of tasks they do in their classes. In addition, we will interview these instructors (and others) to determine what uses they envision for the system and what features will be necessary to meet those needs.

Responsible Parties: Findlay, Isaacson (cooperating with Dillon et al.)

Outputs:
• A white paper summarizing the resulting recommendations (Findlay, Isaacson)
• Revision of existing MMTT authoring and end-user environment specifications (http://theory.music.indiana.edu/mmtt/). (Isaacson, Findlay)
Deliverable date: April 1, 2001

3. Develop and conduct user tests on a series of lesson prototypes

Timeline: February-May 2001

Activity: Develop (using a rapid development application such as Macromedia Director) a series of prototype lessons featuring a variety of activities of the sort determined by the users in the previous item. Conduct user tests on these prototypes using students enrolled in relevant courses. The purpose of this activity is two-fold. First, the data obtained can be used to determine the effectiveness and validity of the types of exercises proposed by the instructors in the previous step. Second, the information obtained will help determine user interface design in later stages.

Responsible Parties: Design by Component Designer, Findlay, led by Isaacson; testing led by Dillon.

Outputs:
- A technical report detailing results of the user tests (Dillon et al., Findlay??)
- Second-stage revisions of the MMTT specifications, focusing on the appearance and function of the various components (Isaacson, Findlay)

Deliverable date: May 31, 2001

4. Develop and conduct user tests on lesson-authoring prototypes

Timeline: March-July 2001

Activity: Develop (using a rapid development application such as Director) one or more prototypes of the MMTT lesson-authoring environment. Conduct user testing on these prototypes with faculty and graduate teaching assistants who would be likely users of the system. Revise and retest as appropriate. The purpose of this activity is to develop specifications for an effective authoring environment for likely users.

Responsible Parties: Design by Component Designer, Findlay, led by Isaacson; testing led by Dillon

Outputs:
- A technical report detailing results of the user tests (Dillon et al., Findlay??)
- Third-stage revisions of the MMTT specifications, focusing on the appearance and function of the authoring environment (Isaacson, Findlay)

Deliverable date: August 1, 2001

[Determine development platform for MMTT authoring environment]
This was part of my original plan, but isn’t really my responsibility; I leave it here to make sure Jon includes it as part of his plan

5. Needs analysis for score notation representation

Timeline: May-August 2001

Activity: We need first to determine what the project’s needs are with regard to the storing of logical musical score representations. A task analysis will be completed involving appropriate project personnel. It will focus primarily on what kind of information needs to be included in a score representation. The analysis will include the needs of both VARIATIONS in general and MMTT in particular.

Responsible Parties: Isaacson

Output
- A white paper describing the music notation needs of the project. (Depending on the findings, there may be a publishable paper lurking as well.) (Isaacson)

Deliverable date: August 31, 2001

6. Develop score—audio linking algorithm/application

Timeline: January-August 2001

Activity: One of the needs of the project is to have a way of linking various music formats and representations. A key feature of that is being able to link a logical score representation and an audio file of the same piece. Because of the number of events involved in a piece, and the number of pieces potentially involved in the library, an automated procedure must be devised. We will develop a software application that does this.

Responsible Parties: Component Designer (working with Isaacson)

Outputs
- A working application (developed incrementally) to perform the task. (Component designer)
- An article to be submitted to a scholarly journal in acoustics and/or computer music describing the algorithm used (Isaacson, component designer)

Deliverable date: August 31, 2001 (application), September 30, 2001 (paper)

7. Develop component: media player (capable of at least digital audio)

Timeline: January-August 2001
Activity: Complete programming necessary to play digital audio files in the format(s) to be used in the application.

Responsible Parties: Programmer (under Dunn)

Output
  • Media player component and an elementary media player modeled after the VARIATIONS player.

Deliverable date: August 15, 2001

**Academic Year 01-02**

8. Analysis of existing music representations

Timeline: September 1-December 31, 2001

Activity: We will research the state-of-the-art with regard to music representation schemes and to study those schemes in light of the preceding task analysis to determine which are compatible with the project’s needs or can be adapted to those needs. This analysis will also involve determining the extent to which repertory libraries already exist in the various formats and the issues involved in encoding new data in the format.

Responsible Parties: Isaacson

Output
  • A white paper describing the project needs, detailing the representations studied, and analyzing their suitability to the project’s tasks.

Deliverable date: December 31, 2001

9. Develop Digital Timeliner Component

Timeline: June-October 2001

Activity: Create the MMTT Digital Timeliner component (including “marker” components from the MMTT Question objects, such as the Event Locator). Complete user testing of sample applications based on it.

Responsible Parties: Programmer (under Dunn, input from Isaacson), Findlay (under Isaacson, input from Dillon)

Output:
- Digital Timeliner software module, which includes the media player component, and an application demonstrating its function.
- Brief technical report on results of user testing.

Deliverable date:
- October 15, 2001 for timeliner
- October 31, 2001 for technical report

10. **Develop graphical image display, text display**

Timeline: October-December 2001

Activity: Complete programming for components that implement the MMTT image and text display objects.

Responsible Parties: Developers (under Dunn, input from Isaacson)

Output: Image display and text display modules.

Deliverable date: December 31, 2001

11. **Implement component support for synchronization between Digital Timelines, score images, and sound recording**

Timeline: January-March 2002

Activity: Add to existing components the ability to synchronize completed components.

Responsible Parties: Developers (under Dunn, input from Isaacson)

Output: Sample application demonstrating component synchronization.

Deliverable date: March 31, 2002

12. **Develop authoring and run-time application framework to integrate components: audio player, Timeliner, image and text display**

Timeline: April-August 2002

Activity: Complete programming needed to provide an authoring environment that will display a functional media player, timeliner, image display, and text display. The application framework should include the ability to save a file and its layout.

Responsible Parties: Developers (under Dunn)

Output: MMTT Stage 1 application
Deliverable date: August 31, 2002

Academic Year 02-03

13. Develop sample instructional applications with MMTT Stage I application

Timeline: September-October 2002

Activity: Test authoring environment with a sampling of authors. Write several functional lessons and test in classroom and library assignments.

Responsible Parties: Findlay (under Isaacson, input from Dillon)

Output: Technical report on results of user testing.

Deliverable date: October 31, 2002

14. Develop and integrate components: score display, score input, MIDI media player, and any tools required to facilitate music theory teaching (especially pop-up palette objects and drawing tools)

Timeline: September 2002-April 2003

Activity: Develop components to display musical scores according to MMTT and/or Variations specifications, including reading scores from Variations repository; to provide interactive user score input; and to create MIDI data for streaming to the media player. Also to create those “question” components that attach to notation display according to MMTT specs.

Responsible Parties: Developers (under Dunn, input from Isaacson)

Output: MMTT Stage 2 Application

Deliverable: April 30, 2003

15. Create input/output filters for music notation representations

Timeline: May-July 2003

Activity: Depending on the music representation scheme selected, there may be a need for representation translation programs to convert pieces encoded in other representations. This will be valuable in a number of ways. It will allow us to populate
the digital library with encoded scores more quickly by incorporating existing encoded works into the digital library (assuming permission was secured). Our encoding process may produce output in a format different from our representation scheme. We may find that different tasks carried out in the digital library (display, MIDI performance, search) are better carried out by representations other than our “default” format. Finally, a filter will be needed to read files encoded according to our default representation scheme and create an appropriate internal representation.

Responsible Parties: Developers (directed by Isaacson)

Output: A collection of interchange programs to convert encoded scores from one representation to another.

Deliverable date: July 31, 2003

16. Develop sample instructional applications with MMTT Stage 2 application

Timeline: May-August 2003

Activity: Test Stage 2 authoring/user environments with a sampling of authors and users. Write several functional lessons and test in classroom and library assignments.

Responsible Parties: Isaacson, Findlay (input from Dillon)

Output: Technical report on results of user testing.

Deliverable date: August 31, 2003

Academic Year 03-04

17. Develop and integrate components: question and assessment objects

Timeline: September-December 2003

Activity: Create the question and assessment components and integrate into MMTT authoring environment.

Responsible Parties: Developers (under Dunn, input from Isaacson)

Output: MMTT Stage 3 application

Deliverable date: December 31, 2003

18. Develop instructional applications using full range of media synchronization capabilities
Timeline: January-May 2004

Activity: To determine the effectiveness of the applications, we will invite interested faculty and graduate teaching assistants to develop a range of sample applications involving both class classroom presentations and student activities in a wide variety of courses (music theory, musical skills, music history, music performance, and general studies).

Responsible Parties: Dillon (help from Findlay, input from Isaacson)

Output: Paper?

Deliverable date: July 31, 2004