Network-Enabled Platforms (NEP-2) Program
Semi-Annual Progress Report

Project Information

Lead Contractor:	McGill University		
Project Name:	Open Orchestra	Project #:	NEP-54
Date:	September 30, 2010.		
Claim Period:	March 1, 2010	To:	August 31, 2010.

PROGRESS REPORT CHECKLIST – Please ensure the following sections are completed:

Project Progress	Completed
1. Technological Progress	Yes
2. Project Development & Activities	Yes
3. Project Plan	Yes
4. Updated Claim Forecast	Yes
5. Intellectual Property	Yes
6. Communications	Yes
7. Web Site Information	Yes

CLAIM CHECKLIST - Please ensure the following sections are completed and attached to this document:

	Completed and Attached
8. Financial Claim Schedule	Yes
9. Invoices for Eligible Costs over $1000 incurred and paid	Yes
10. Employee Timesheets (signed by employees and supervisor)	Yes

APPENDIX CHECKLIST – Please include any relevant materials:

	Attached
11. Communication Materials	No

1. Technological Progress

1. Hardware technology to be used for video and audio acquisition

This is described in "Appendix 1: Revised Video and Audio Acquisition" document.

2. Software technology

The structure of the database and software architecture have significantly evolved to include the representation of instruments and musical parts, as is anticipated with the work progressing on these areas. In addition, the system architecture has changed to store the user data (i.e., user recordings) in the cloud for flexibility with respect to storage resources, without needing to set a hard limit on the number of recordings that could be stored. The user interface features have been revised, resulting in the creation of the UI wireframes currently being used for testing.

3. Hardware technology to be used in the Student Workstation

The workstation consists of:

- high end computer
- monitor mount and lift mechanism
- three widescreen video monitors
- one widescreen touchscreen monitor in the music stand position for displaying the electronic score and system controls
- noise cancelling headphones
- stereo microphone
- audio monitor control unit

There have been changes to the hardware technology of the following components since the last Progress Report.

Monitor mount and lift mechanism

- The Teknion model of lift table described in the last Progress Report was tested and found to be too awkward for use in the project.
- Further discussions with Melnik Resources Ltd. resulted in a reduction of the cost estimates so a custom solution became possible. A preliminary design appears below.

Widescreen video monitors

- The original plan outlined in the SOW specified 24" monitors. The last Progress Report indicated that this had been changed to 32" HDTVs for a more immersive experience. Fortunately NEC heavily discounted their 32" monitors before the HDTV purchase was made so that the project was able to benefit from both the increased size and the quality of the NEC monitors.

Touchscreen monitor

- Finding a suitable touchscreen monitor for the student workstation has been a persistent problem. The touchscreen is a challenge because the student must be able to write on the electronic score to make notes on how the music should be played or to write comments for later review by the instructor while also being able to use a finger touch to turn a page of the score. While tablet computers are designed for handwriting, most touchscreen displays are not. The few that are have been small and do not recognize a finger touch.
- After initial unsuccessful testing of other touchscreens, the last Progress Report explained that 3M MicroTouch™ technology would be investigated. A touchscreen monitor with that technology was assembled at McGill, but the quality of the writing on it was unsatisfactory. Wacom touchscreens were then tested that had excellent writing, but no finger touch capability.
- Finally Bluecube introduced a new 17" touchscreen using N-Trig technology with both writing and finger touch capability that appears to meet the necessary specifications. These have been ordered. The 17" size with a 16:9 aspect ratio means that they will be turned vertically in a portrait view to display one page of the score full size.

2. Project Development & Activities

1. **Video and audio acquisition test complete**
   Status: Complete

2. **Voice acquisition successful or abandoned**
   Status: Complete
   The studio equipment trials at UBC demonstrated that voice acquisition will work for a choir or for opera singers rehearsing while standing in a semi-circle using music stands. It is doubtful that it will work for an opera performance where the singers move about on stage.

3. **Simultaneous multiple track playback from database complete**
   Status: Complete

4. **Multiple track video and audio player test complete**
   Status: Complete

5. **Track synchronization implemented if necessary**
   Status: Complete

6. **Revised video and audio acquisition document complete**
   Status: Complete (See Appendix 1)

7. **Video and audio recordings for software development ready for editing**
   Status: Complete as of September 21, 2010.

8. **Score playback with overlay complete**
   Status: Complete

9. **Record function operational**
   Status: Delayed to November 2010.

10. **Comments indexed to score and both retrievable from database**
    Status: Delayed to December 2010.

11. **Audio mixing console complete**
    Status: Complete

12. **Evaluation documents complete for video, audio and score playback, audio record**
    Status: Delayed to December 2010.
    The user workstation is due for delivery in November 2010 so the evaluation documents will not be complete until there has been user testing.

13. **Player/recorder demonstrated for CANARIE staff**
    Status: Complete as of September 21, 2010.
    The player was demonstrated, but the record function has been delayed to November 2010 so that function will be demonstrated in February 2011.

14. Selection of playback tracks functional
   Status: Completed ahead of schedule (originally due Feb. 28, 2011)

3. Project Plan

The project has followed the plan outlined in the SOW with the following exceptions:

1. **Camera rig design and manufacture**
   As reported at Milestone 1, it was decided to do this work at McGill where two rigs could be produced for the price of one from external sources, but with a longer delivery. However production at McGill was delayed by a further three months due to prior commitments and it was felt that the recording schedule could not be postponed further. An external supplier, Melnik Resources Ltd. in Ontario, agreed to design and manufacture two rigs for the same price quoted by McGill. The rigs were delivered as promised, first to UBC where tests resulted in minor modifications and then to McGill in time for the jazz band recording.

2. **Recording and testing schedule**
   As originally envisioned, there was to be either a jazz band or a classical orchestral recording and possibly an ensemble recording and/or a voice recording. In discussions with the user group, it was decided to have both a jazz band recording and a classical orchestral recording. The voice recording would be done at UBC as soon as a camera rig became available and the other recordings would be done at McGill with a second camera rig. The jazz band recording would be the first done at McGill and then tested by the user group. The classical orchestral recording would be done afterward and build upon lessons learned with the jazz band recording. The ensemble recording would be only be done near the end of the project if time and budget permitted.

   The delay in delivery of the first camera rig to UBC meant that the UBC voice participants had left for Europe for the summer by the time it arrived. The McGill jazz participants were also not available during the summer although it was possible to make all of the arrangements for recording in September before they left. The first recording sessions took place Sept. 18 and 19. It is anticipated that testing will take place in the latter part of November. In the meantime, arrangements are being made for voice recording at UBC in November. The classical orchestral recording should take place in February or March, 2011.

3. **Touchscreen**
   As explained above, finding a suitable touchscreen monitor for the student workstation has been a persistent problem. The project requires touchscreens that allow the student to both use a finger to push a button and use a stylus to write on the electronic score. Most touchscreens allow one or the other. Finally a new touchscreen was announced by Bluecube using N-Trig technology that appears to meet the specifications and the screens were ordered.

4. **User workstations**
   Design of the user workstation was delayed because it partly depended on the choice of touchscreen. Melnik Resources Ltd. was also selected to design and build the workstations. This saved time and money because the lift system is identical to the one for the camera rig. The workstations are scheduled to be delivered in the latter part of November in time for testing of the jazz band recordings.

Deliverables – February 28, 2011.
The deliverables at the end of the next two quarters on February 28, 2011 are:

15. Record function operational
16. Comments indexed to score and both retrievable from database
17. Video and audio editing complete
18. All video and audio recordings in database
19. Audio editor complete
20. Database tested under load
21. Expert system complete to display differences between user and expert performance
22. Evaluation documents complete for video, audio and score playback, audio record, audio mixing console and audio editor
23. Recorder, audio mixing console and editor demonstrated for CANARIE staff

4. Updated Claim Forecast

The actual cash flow summary, with actuals and forecasts for the remaining claim periods, is attached as Appendix 2. There is also an explanation of variations from the budget after Milestone 1.

5. Intellectual Property

There was no Intellectual Property developed during the reporting period.

6. Communications

There were no communications related to the project that took place during the reporting period.

7. Web Site Information

The project web site address where documentation is being maintained is:
http://canarie.mcgill.ca/project_nep2_index.html