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IMMERSIVE TECHNOLOGIES PILOT PROJECT PROPOSAL

FORSYTH LIBRARY

Forward Thinking. World Ready.

FORSYTH LIBRARY IMMERSIVE TECHNOLOGIES PILOT PROJECT PROPOSAL

EXECUTIVE SUMMARY

Forsyth Library must continue to look forward and to consider new approaches to service and new technology applications that could provide large-scale benefits for the institution, the faculty, and the students. This pilot project proposal considers immersive technologies that could become logical next step platforms for knowledge sharing and that may become ubiquitous in the near future. Immersive technologies that include simulation-based learning, virtual reality, telepresence, and interactive 3-D technologies may allow the Library to further build the collaborative model for on-campus students and encourage team-based projects between on-campus and off-campus students.

This proposal suggests four methods for implementing immersive technologies within Forsyth Library. Those methods include:

- Multi-user Application Software
- A Video Wall Environment
- Telepresence
- 3-D Interactivity

We have selected Room 133 located on the main floor as the beta site for an Advanced Technology Smart Study Room. The work accomplished in this Advanced Smart Study Room will provide the basis for a larger immersive technologies theater within the renovated Forsyth Library

Multi-user Application Software allows groups of students or faculty to edit and review documents, discuss ideas, and gain feedback from other individuals while using the same powerful PC. A **Video Wall Environment** allows the simultaneous display and manipulation of video, images, web sites, and documents on multiple high-resolution monitors attached to a single PC. **Telepresence** adds the capability for high resolution video conferencing to multiple points through the existing network. **3D Interactivity** utilizes new technologies to create a simulation learning environment using 3D video objects and touch manipulation. The combination of these technologies placed in a central location within the Library will provide a platform for collaborative learning, discovery-based learning, virtual laboratories, and simulation-based learning unmatched by other technologies while encouraging problem solving, critical thinking, and exploration.

Forsyth Library proposes to establish this pilot project through the use of existing OOE funds and action plan funding requests. If funded, the pilot project will begin Fall 2010 and continue through academic years 2011 and 2012. Participation in the project will be open to faculty, staff, and students.

BUILDING ON SUCCESS

During 2007, Forsyth Library began to transition from the traditional model of academic libraries to a learning commons model based on learning spaces, new technologies, social influences, and democratic impacts. This model continues to provoke discussion about shifts in the services provided by the Library and the presence of disruptive technologies within the facility. The construction of Smart Study Rooms, open study spaces, and knowledge-supporting technologies receives much credit for an increase in the number of students using the Library's resources.

As the University and the Library begin the fall 2010 semester, the need to enhance the current learning commons model becomes apparent. In part, changes occurring within the public services areas of the Library speak to this need. Rather than maintaining a highly-traditional reference desk, the face-to-face services provided by the Library will begin to extend into the classroom and build creative relationships between the Library and academic faculty.

Aside from the services perspective, this proposal addresses the enhancement of technologies associated with the learning commons model. Referring back to the original proposal, the technologies concept involved the promotion of collaborative learning among both on-campus and off-campus students. For the most part, this approach worked well. Students have utilized the Smart Study Rooms and open study areas and have used large-screen televisions attached to mobile technologies, DVD players, and CATV networks when working on presentations and projects.

Even with that success, the Library must continue to look forward and to consider new approaches to service and new technology applications that could provide large-scale benefits for the institution, the faculty, and the students. This proposal considers a combination of technologies that could become logical next step platforms for knowledge sharing and that may become ubiquitous in the near future.

Immersive technologies that include simulation-based learning, virtual reality, telepresence, and interactive 3-D technologies may allow the Library to further build the collaborative model for on-campus students and encourage team-based projects between on-campus and off-campus students. When appropriate, these new-wave technologies may also allow faculty to engage learners and present knowledge, may provide new innovative technologies for collaborative work between diverse student audiences, may prompt different methods for democratizing the institution, and may transform the exchange of information. In addition, the implementation of these technologies on our campus could provide the basis for a new marketing strategy with prospective partners. We also believe that the application of these technologies may position Forsyth Library to redefine our perspective about the stewardship of knowledge.

DEFINING IMMERSIVE TECHNOLOGIES

Immersive technologies involve the computer-generated simulation of reality within physical, spatial, and visual dimensions. Individuals may use these technologies to interact with computer-generated environments and to blur the line between the physical world and the simulated world. As an example, a virtual reality system could allow engineers to simulate a walk-through of a building prior to construction. Software interacts with hardware to produce the virtual environment and process user input to provide a real-time response. Immersive technologies include virtual environments, telepresence, and 3D interactive systems.

We believe that a combination of immersive technologies can provide high definition access to knowledge resources, provide the tools for virtual field trips to historical institutions, museums, and libraries, and establish the basis for partnerships between FHSU, other institutions, and content providers. Our vision includes access to subject-matter experts, interactive distance learning, innovative applications, administrative meetings, and special access needs.

APPLYING IMMERSIVE TECHNOLOGIES WITHIN AN ADVANCED SMART STUDY ROOM

This proposal suggests four separate—yet inter-related—methods for implementing immersive technologies within Forsyth Library. Those methods include:

- Multi-user Application Software
- A Multi-monitor Environment
- Telepresence
- 3-D Interactivity

We have selected Room 133 located on the main floor as the beta site for an Advanced Technology Smart Study Room. While the room offers an optimal location and workable dimensions, we will need to take the appropriate steps to sound-proof the room and will need to purchase furniture that promotes a team-based learning environment. Along with the advanced technologies, the room will also feature now-standard large-screen monitors that have the capability to connect to personal computers, DVDs, and CATV. The work accomplished in this Advanced Smart Study Room will provide the basis for a larger immersive technologies theater within the renovated Forsyth Library

DEFINING THE VISION

Multi-user Application Software

The first method for achieving the immersive technology goal involves the installation of TeamPlayer 2.2 software that allows groups of students or faculty to edit and review documents, discuss ideas, and gain feedback from other individuals while using the same powerful PC. TeamPlayer Sandbox provides a platform for multi-user projects and allows the movement of objects through drag and drop processes.

Our vision for the use of this software includes the purchase of a powerful PC with processing power, memory, and storage space for the purpose of supporting multiple keyboards, mice, and a broad range of software. TeamPlayer 2.2 will support word processing, spreadsheet, presentation, and web-based applications in a multi-user environment. We believe that faculty will use this environment to produce reusable learning objects and that students will use the collaborative technology when creating projects and presentations.



Multi-monitor Environment

Our initiative links the functionality of TeamPlayer 2.2 with a multi-monitor environment that will allow the simultaneous display of video, images, web sites, and documents. The implementation of a high resolution “video wall” also establishes the environment for telepresence.

Our vision for this environment envelops the concept of collaborative learning and provides teams of students with the capability to manipulate simultaneous applications while working on projects and presentations. In addition, the multi-monitor environment blends nicely with our next initiatives: telepresence and 3-D interactivity.



Telepresence

After reviewing the telepresence technologies offered by many vendors, we have selected the LifeSize Team 200 solution as the best option for a pilot. While LifeSize offers the best cost-effective solution, their products may also address the capability to mainstream telepresence technologies by eventually accepting Skype video users into the virtual learning environment. The price point for entry-level multi-point LifeSize systems begins at \$12,000.

Our vision for telepresence extends beyond administrative meetings and to the virtual classroom. In the very near future, Smartphones equipped with forward-facing cameras and with Skype video could allow faculty and students to use telepresence to gain an on-campus experience. The use of these technologies could encourage the development of a new virtual learning environment, could provide a platform for collaboration between on-campus and off-campus students, and could provide a method for allowing international students to communicate with their home institutions.



The 3-D Interactive System

The last stage of immersive technology implementation at Forsyth Library involves 3D interactivity. Emerging 3D interactive solutions provide a platform for collaborative learning, discovery-based learning, virtual laboratories, and simulation-based learning unmatched by other technologies while encouraging problem solving, critical thinking, and exploration. We propose the implementation of a low-cost 3D interactive system and the accompanying use of 3D learning objects by select faculty.

At the low-cost end of the spectrum, we can utilize wii technologies to provide a 3-D virtual environment for a single student. For the purpose of a pilot study, we believe that this system would provide a sufficient platform for assessment. On a much larger scale, Eon Reality—a California-based corporation—offers 3D interactive systems for educational use and examples of the direction that the Library and University could go. The conclusion of this document provides a list of institutions that have purchased the Eon Reality systems

Our vision for 3-D interactivity and simulation-based learning covers a broad range of disciplines and development. Examples already exist of students in INT-similar classes at other institutions producing 3-D content and of 3-D learning object repositories. We believe that disciplines ranging from Justice Studies to Physics could utilize 3-D interactivity.



EXAMPLES OF ACADEMIC INSTITUTIONS AND IMMERSIVE TECHNOLOGIES

Although this proposal provides only three examples of immersive technologies used within academic institutions, the deployment of these technologies has gained greater use and attention.

Ohio University

Ohio University established its Virtual Immersive Technologies and Arts for Learning Laboratory as a multi-disciplinary research and development facility during 2006. The VITAL Lab specializes in creating immersive 3D virtual environments and synthetic worlds for teaching, learning, and training purposes.

Case Western Reserve University

Case Western Reserve University became one of LifeSize's first customers during 2005 and was one of the first universities to implement HD video in a campus setting. During 2005, CWRU conducted live telesurgery in high definition. CWRU now uses video-centric technologies that take advantage of its gigabit-to-the-desktop network. Telepresence allows meetings from different geographic locations, interviews of potential faculty, distance learning,

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and research project collaboration to occur. Approximately 30 departments have asked about using video communications within their coursework to give students a true-to-life experience.

"The immersion factor of the LifeSize systems is the important piece," Mike Kubit, Director of MediaVision said. "The more realistic the quality, the more it draws you into that session as it allows you to pay attention to facial expressions and pick up on non-verbal cues."

El Paso Community College

EPCC has been using 3D visualization solutions for more than four years with its 3D Holo Lab. One full-time employee and three student employees create interactive content for learning environments through the use of EON Studio and Autodesk 3ds Max. According to John Gilbert, Coordinator of the 3D Holo Lab:

"Many student surveys have been conducted covering the disciplines outlined above and, to date, EPCC has never received a negative comment about the contribution of 3D to the learning process. On the contrary – students universally say 3D greatly enhances understanding. The world is rapidly moving to 3D and learning institutions need to use it or risk falling behind. El Paso Community College feels fortunate to have enlightened leadership who embraced this technology early in the game," says John Gilbert.

IMMERSIVE TECHNOLOGIES PILOT PROJECT PRELIMINARY BUDGET

Forsyth Library will use OOE funds for the purchase of some equipment needed for the early stages of the pilot project that include team-based software and the multi-monitor environment. Moreover, the Library will dedicate internal staff resources to the development and implementation of the technologies. The implementation of the later stages of the pilot project that involve telepresence and 3D interactivity will require either action plan or grant funding. The preliminary budget is:

Immersive Technologies Preliminary Budget

Item Name	Description	Funding Source	Cost
TeamPlayer Software	10-user license for multiple-user software	University Action Plan	\$ 500.00
Multi-monitor environment	Cinemassive 6-monitor video wall	University Action Plan	\$ 13,300.00
LifeSize Team 200 software and hardware	Telepresence 3-site multipoint hardware and software	University Action Plan	\$ 8,910.00
Eon Reality Icatcher Mini Active Portable 3D Stereo Projection System, EON Studio Lab software	Entry-level Eon Reality 3D Interaction hardware, software, training	University Action Plan	\$ 43,000.00
Room 133 Remodeling Cost			\$ 4,000.00
Total			\$ 69,710.00

Additional costs including furniture, mounting accessories, and labor will be absorbed within the Forsyth Library OOE. We should stress, however, that the costs shown in this table are based solely on a pilot project. The costs could fall below the total amount if vendors agree to equipment and service loans. Moreover, all equipment could seamlessly transfer to a new location. Full-service telepresence and 3D interactive systems will have a much higher cost. Referring to the renovation proposed for Forsyth Library, the budget for a new facility should include the funds needed to achieve a full range of immersive services.

IMPLEMENTATION AND ASSESSMENT

Although one portion of this proposal refers to “select faculty,” we recommend opening the pilot program to as many students and faculty as possible. In brief, the objective of a pilot program should involve introducing diverse groups to the technologies. With this, the project gains a creative energy that a program accessible to only a select few could not achieve. Referring back to the issue of “select faculty,” equipment and space limitations may restrict immersive technology course development to “select faculty.”

The immersive technologies pilot project will include several assessment methods. On a very simple level, assessment may address the number of faculty and students using the

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technologies. Yet, the project will also seek to assess the impact of the technologies on learner engagement, the understanding of knowledge strands, and the ability of faculty to successfully produce immersive content. On a much broader scale, the project will also assess the impact of immersive technologies on the academic library's capability to provide access to knowledge.

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ON-LINE IMMERSIVE TECHNOLOGY RESOURCES

Cinemassive Video Wall

<http://www.youtube.com/watch?v=reSy0qhxH3Y>

Telepresence – LifeSize at CES 2010

<http://www.youtube.com/watch?v=VDHlgMbrVrQ&feature=related>

Telepresence – LifeSize Express 220

<http://www.youtube.com/watch?v=iC3dEkS0yYc&feature=channel>

Telepresence – LifeSize Room 220

http://www.youtube.com/watch?v=jvH7XJ_IL08&feature=channel

Multi-touch Technologies

<http://www.22miles.com/video-section/favorite-videos/multitouch-3d-interactive-heart>

Eon Reality Simulation-based Learning

<http://www.youtube.com/watch?v=bL1D1ElmszM&feature=related>

Eon Coliseum

<http://www.youtube.com/watch?v=R9Ui-F2m0MY&feature=related>