

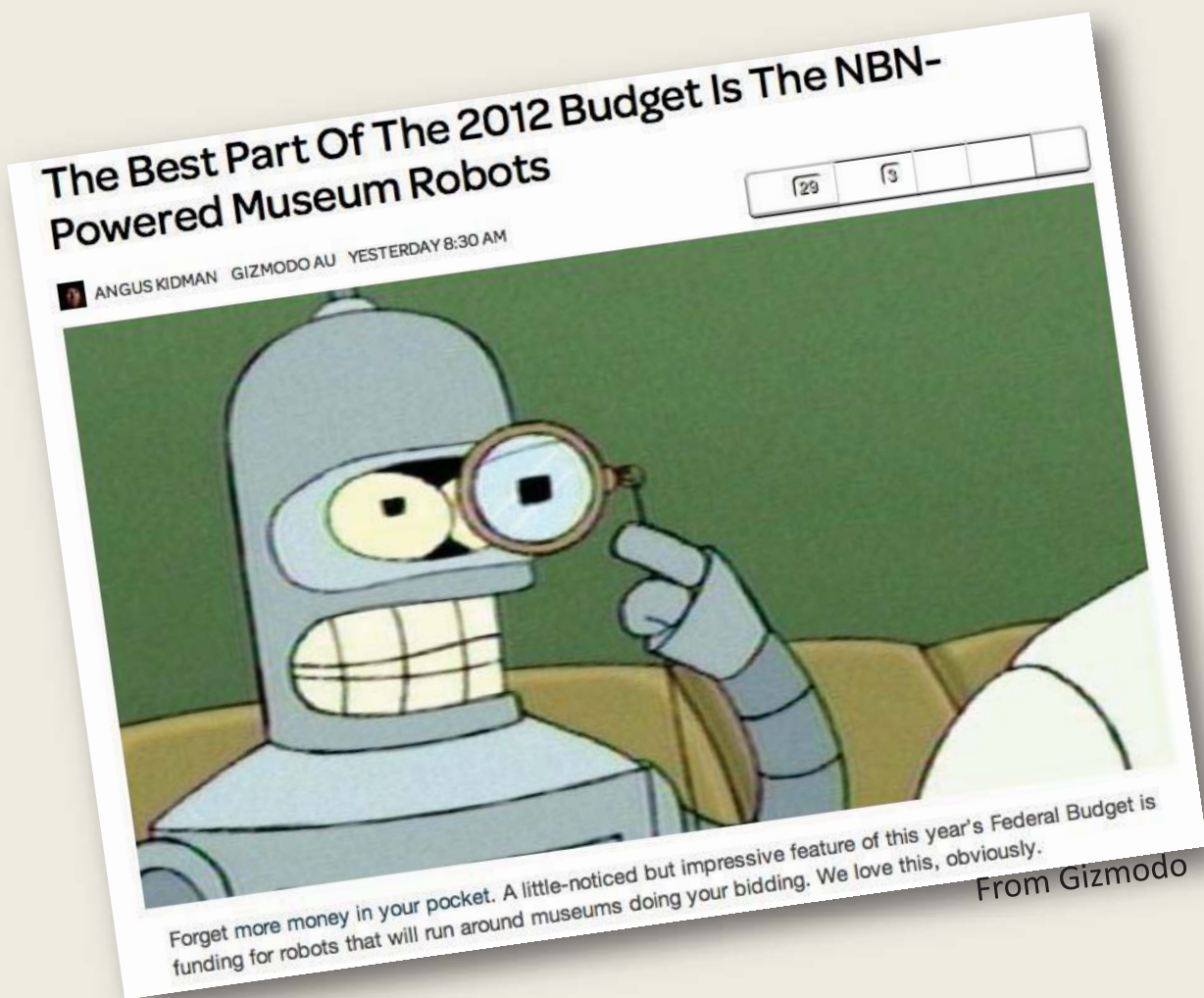


Mobile Telepresence for Museums

Robert Bunzli, Project Manager, NMA
Presentation for the Digital Outreach Stream of the
QuestNet 2012 Conference, Cairns Qld 12-13 July



An Australian Government funded initiative



Digital Productivity — putting museums online for public access

The Government will provide \$2.4 million over two years from 2011-12 to provide online remote access to national cultural institutions to help demonstrate the opportunities offered by the National Broadband Network (NBN).

Using the high bandwidth capability of the NBN, visitors will be able to undertake virtual tours of these institutions via mobile robots. Users will be able to engage and interact with local visitors and tour guides and will be provided with a range of additional on-screen information to enhance their experience.

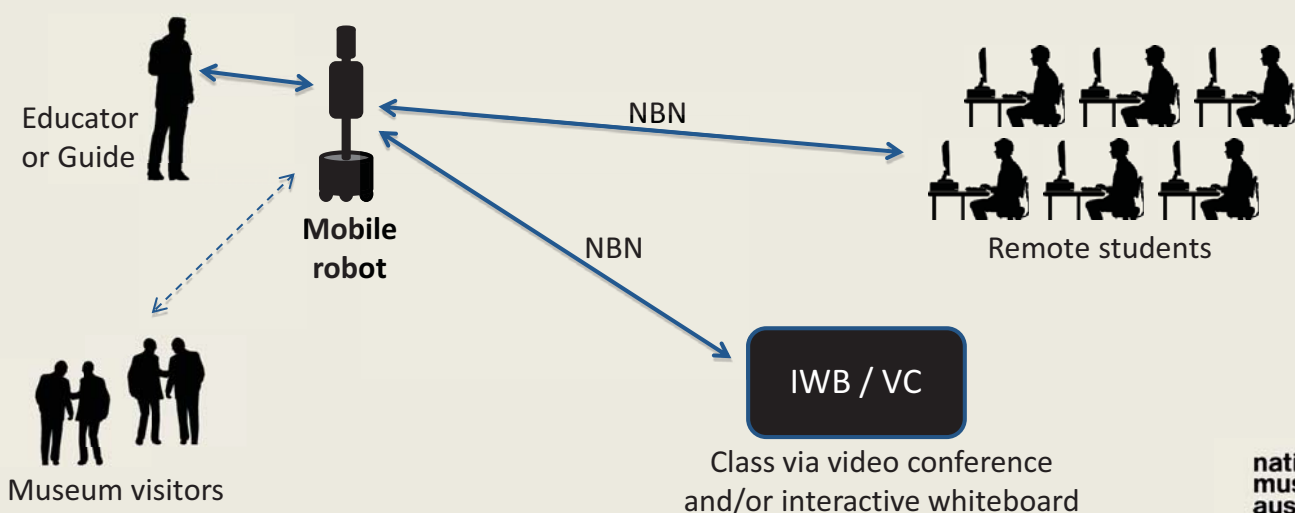
This measure is part of the Government's broader digital economy strategy.

Department of Broadband, Communications and the Digital Economy

Project overview

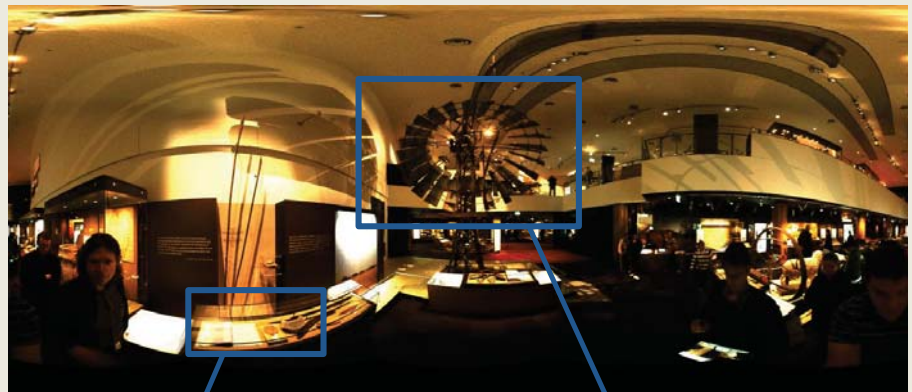
A trial of technology that will allow remote visitors to 'visit' a museum using a semi-autonomous mobile robot and an immersive web interface

- Allows live interaction between remote students and the local guide in the museum
- Multiple remote students connect via a single robot, but can control their own view within the gallery
- Remote students can access additional digital content about objects on display, to augment the tour experience



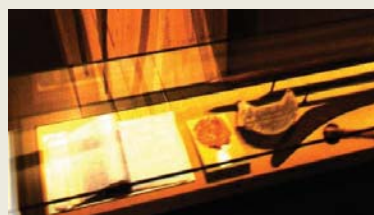
Key Technology

360 camera and panoramic viewer

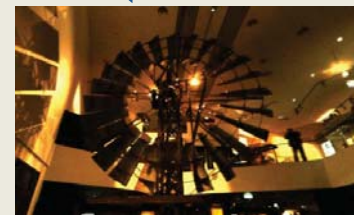


From the 360° camera, six images are stitched together and streamed as a high resolution omni-directional image

Each remote viewer can then independently 'look around' using a panoramic viewer within their browser



Student 1



Student 2

User Experience

Remote visitor with an NBN connection

Remote visitor can:

- See and hear the local guide, and other museum visitors
- Indicate that they have a question for the guide
- Video chat live with the local guide (or via audio only if they don't have a webcam)
- Look around the gallery using their own browser-based immersive viewer
- Click on 'hot spots' within the view to access additional digital information about the display (images, video, etc)



Objectives

(July 2011 – June 2013)

Provide a facility in the National Museum of Australia that will

- Showcase the transformative nature of the National Broadband Network.
- Provide an educational experience to remote students (and others) who would not otherwise be able to visit.
- Provide an enhanced educational experience—immersive, interactive, engaging.

Project will culminate in a six month trial of the facility operating in the Landmarks Gallery of the NMA
Oct 2012 – May 2013



**national
museum
australia**

Objectives

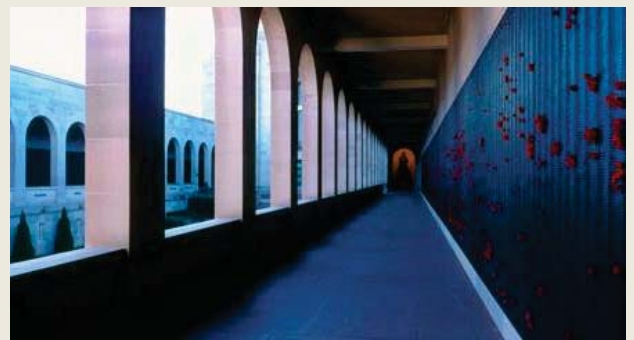
Beyond the current project

Potential ongoing educational facility in the NMA.

Blueprint for use in other institutions.

Extension into community hubs, aged-care facilities, etc.

Transfer technology to a commercial service provider for future installations.



**national
museum
australia**

Mapping the *Landmarks* Gallery ...



A developing project...

Recent functional design decisions

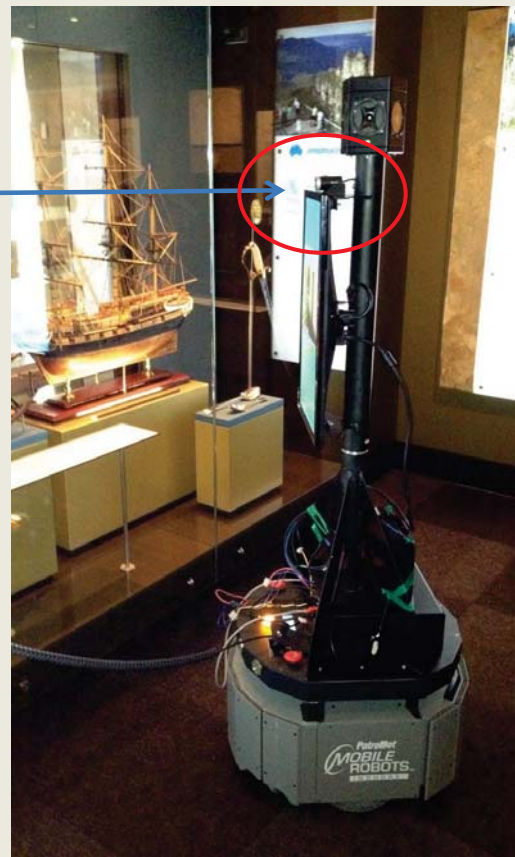
- Reduced height of 360 camera
- Front v. Back orientation
- Touch screen interface
- On-board computer upgrade
- Retractable camera
- Educator headphones and mic



Retractable Edu-cam

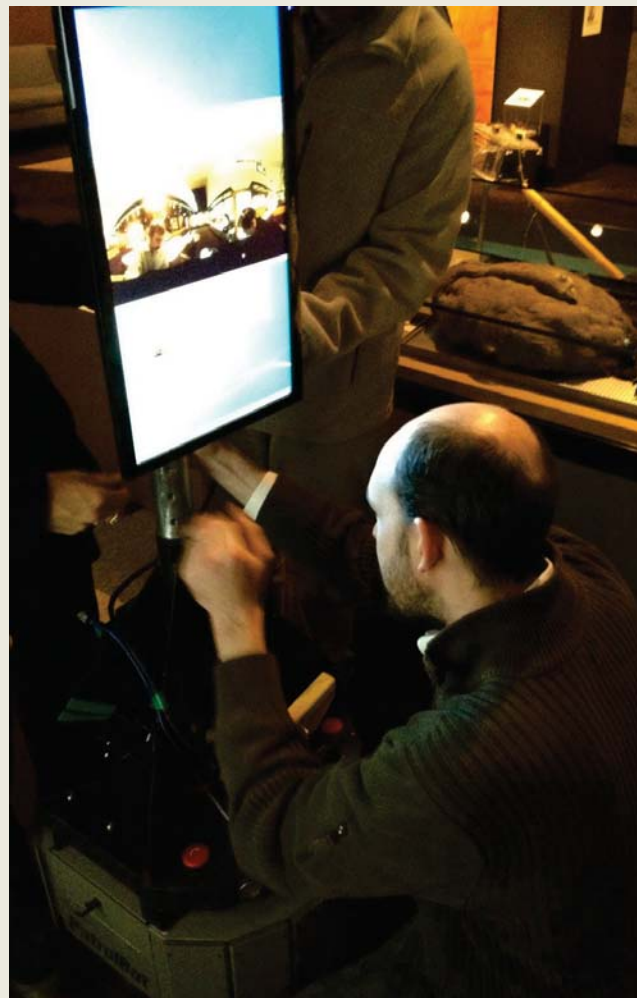
View of Educator from this camera to be constantly on students' screens.

On a retractable cable and mount so that Educator can use it for manual close ups on objects.



User interface

Touch screen interface to be installed for greater control by educator / guide.



User interface prototype



Live video of active student asking a question

Educator's camera

Tiles for students on the tour
here polling a multiple choice question.
Students can raise their hand to ask questions.

Panoramic video

Touch buttons to progress the tour

Techniques

Interactivity being designed for students accessing the Robot

- Narrative: Story telling opportunities.
- Class discussion and decision making.
- Polling: Yes/No, True/False, Multiple choice, Sliding rating of Agree/Disagree.
- Augmented content: Hi res pictures, movies, Flash interactives.
- Photo overlays of small items.
- Edu-cam for close up shots.
- Educator ability to force control the screen to counter distractions.
- Collecting objects, Shopping Trolley-style, for later examination.
- Making written comments about objects for later discussion.
- Tour concept versus an Education Program...

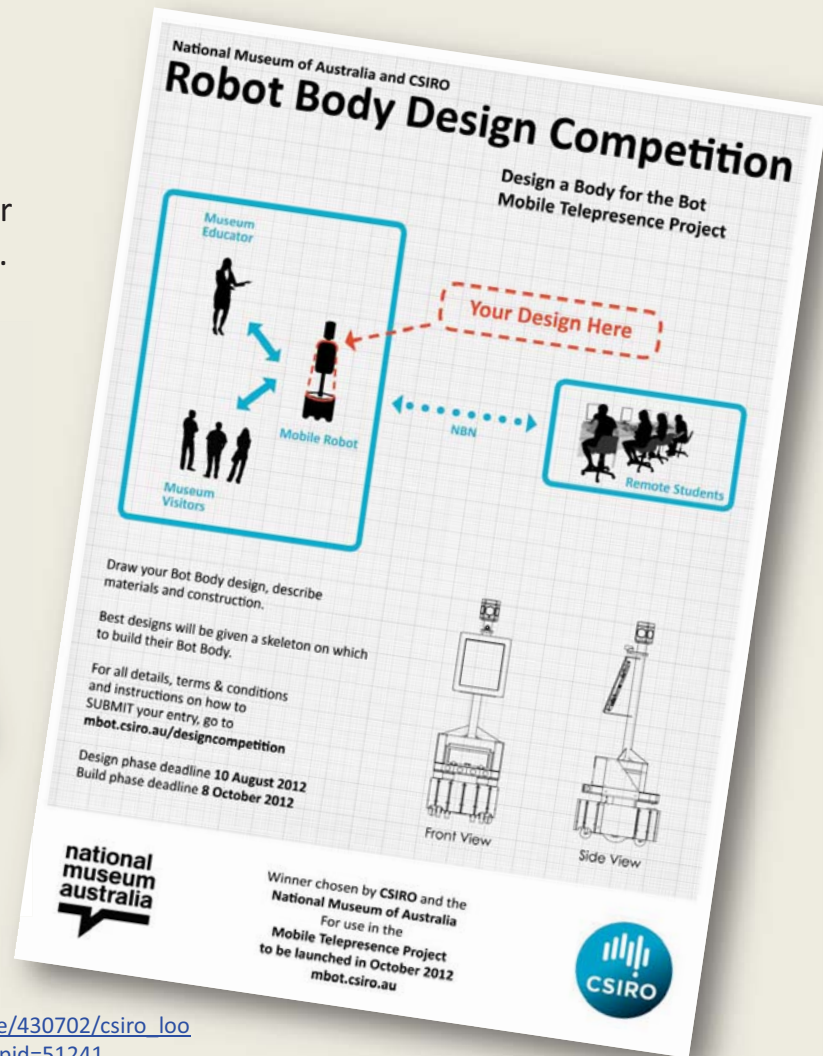
Skin design

To be followed by a competition for school students to name the robot.



Computerworld article:

http://www.cio.com.au/article/430702/csiro_looking_robot_designer/?fp=4&fpid=51241



“Robots, Telehealth in NBN sell”

Financial Review
10 May 2012

Three main web pages

Project Page "mbot"

<http://nma.gov.au/blogs/education/tag/mobile-telepresence/>

NMA Pages

<http://www.nma.gov.au/education-kids/mobile-telepresence>
<http://nma.gov.au/blogs/education/tag/mobile-telepresence/>

The screenshot shows the National Museum of Australia website. The header includes the museum's name and navigation links: WHAT'S ON, COLLECTIONS, HISTORY & IDEAS, EDUCATION & KIDS. The main content area is titled 'Mobile telepresence' and describes an innovative partnership project between CSIRO and the Department of Broadband, Communications and the Digital Economy. It mentions that school students from regional and remote Australia will be able to virtually visit the Museum using mobile telepresence technology. A diagram illustrates the system: a mobile robot in the museum connects via a single robot to a mobile telepresence system, which then connects via the National Broadband Network (NBN) to remote students. The page also includes a 'More information' section with links to CSIRO project websites, Education blog posts, and a CSIRO blog post. The footer contains contact information for the museum shop and general admission details.

<http://www.csiro.au/Organisation-Structure/Divisions/ICT-Centre/Museum-Robot.aspx>

The screenshot shows the CSIRO Museum Robot project page. The header includes the CSIRO logo and navigation links: Explore CSIRO, Partner, Media, Events, Education, Publications, Careers, Contact. The main content area is titled 'Museum Robot' and describes the project, which aims to allow remote visitors to visit the National Museum of Australia using a mobile robot and high-speed broadband connectivity. A diagram illustrates the system: a mobile robot in the museum connects via a single robot to a mobile telepresence system, which then connects via the National Broadband Network (NBN) to remote students. The page also includes a 'Fast Facts' section, a 'Contact Information' section for Ms Samantha Lucie, and a 'Related Links' section with links to the ICT Centre, Autonomous systems, National Museum of Australia, Department of Broadband, Communications and the Digital Economy, and the Digital Economy (external link).



Keeping in touch CSIRO and NMA are blogging...

The screenshot shows a blog post titled 'Education at the National Museum of Australia' by CATH on 28 MAY, 2012. The post is about 'Cybernetic museum learning' and describes a system for mobile telepresence at the Museum. It mentions that the system is a remote-controlled robot museum guide in South Korea. The post also includes a photo of a live educator interacting with a camera-equipped robot. The sidebar contains 'Recent comments' and 'Categories'.

<http://nma.gov.au/blogs/education/tag/mobile-telepresence/>

The screenshot shows a blog post titled 'News @ CSIRO' with the subtitle 'A little bit of robot love'. The post is dated May 22, 2012, and is authored by Lou Morrissey. It discusses the CSIRO Museum Robot project and mentions that the robot will be used to guide visitors through the National Museum of Australia. The post also includes a photo of the robot and a quote from Greg Dexter and Kerrie. The sidebar contains a 'Subscribe to this blog' section, a 'More information?' section, and a 'Posts by topic' section.

<http://csironewsblog.com/2012/05/22/a-little-bit-of-robot-love/>

