CASE STUDY

Turning Visions into Reality

The University of Birmingham's Digital Humanities Hub

Birmingham UK

The University of Birmingham's Digital Humanities Hub (known throughout the world and the Web as do.collaboration), is home to an elaborate fusion of research and exhibition space that is changing the way museums and galleries function on multiple levels.

A Different Kind of Museum

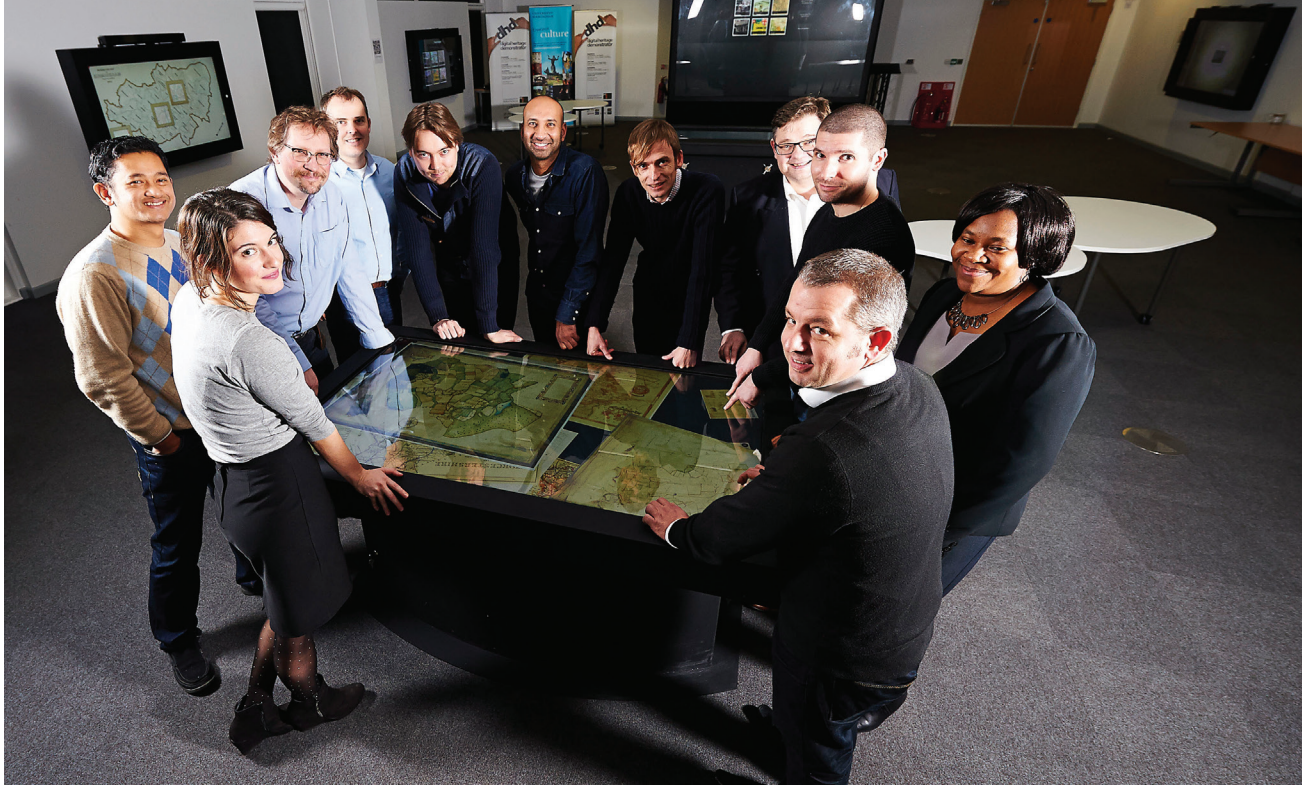
It begins with the visitor experience — an encounter that gives new meaning to the term "interactive." The Hub's Michael Chowen Prototyping Hall is a collaborative, immersive exhibition space equipped with a range of multi-touch screen enabled tables, as well as four 65-inch wall mounted touch screens, and a massive 3m by 2m 4K 3D multi-touch wall. Visitors are provided with a variety of tablets and hand held devices, which interconnect and interact with the larger screens, creating an elaborate interactive environment.

The touch screen surfaces — both wall mounted and tabletop — are key to the end user experience. "A visitor to the museum can walk up to a collection of assets displayed on a screen, touch a virtual folder to open it, and spread its assets out on a virtual desktop," explains Dr. Richard Clay, Senior Lecturer at the University and Co-Director of the Hub. "They can use familiar touch screen gestures to select a particular asset, rotate and manipulate it, and zoom in on it to extraordinarily fine detail."

All screens — large and small, stationary and mobile — are tightly networked, enabling a visitor to move the content they are looking at

Objectives

- Create a new type of museum environment that will appeal to, and hold the interest of, today's Internet-oriented visitor
- Design a mechanism for observing the habits and preferences of museum visitors, and use that information to further refine the visitor experience
- Seamlessly integrate both the visitor experience and the researcher experience into a unified system
- Analyze the needs of both levels of user, without being restricted by the technology itself



from wall to table top to handheld device and back again. "They can drag an item to their device using hand gestures to 'flick' it to a multi-user interface where it can be explored collaboratively," says Clay.

Unlike a traditional museum space, visitors to the Hub can select from an expansive selection of materials, making each visit uniquely their own. The content ranges from ancient artifacts and fossils to medieval maps, historical postcards and documents. The Hub's staff are continually assembling and adding to the facility's collectable materials and archives, using ultra-high resolution scanning to sample and catalogue items in 2D and 3D formats. Many of the items are far too fragile to be moved or displayed in a traditional gallery setting. The Hub's virtual technology enables visitors to manipulate and examine them in far more intricate detail than a static, glass display case could ever provide.

The Research Level

As innovative and compelling as the Hub's visitor experience may be, it's only one piece of a complex, multi-faceted system designed to serve multiple masters. For researchers at the University, the Hub represents an immensely powerful set of tools for learning about the user experience.

Visitors to the exhibits agree to be outfitted with special headwear and glasses designed to intricately track each individual's head movements and gaze. As they move around the Hall, statistics are compiled on which exhibits they select, how they display them, and which items they focus on. The result is a wealth of information — data that can be analyzed to gain deep insight and understanding into user patterns and preferences.

"What we have created is essentially a 3D model of the room," explains Dr. Clay. "Our researchers

can see people moving around in real time, and get information on what they look at and what they do. At any point during the day, we can query and get a view of the whole room, with thumbnails of what's playing where. We can compile that information, analyze it, and extract specific data from it."

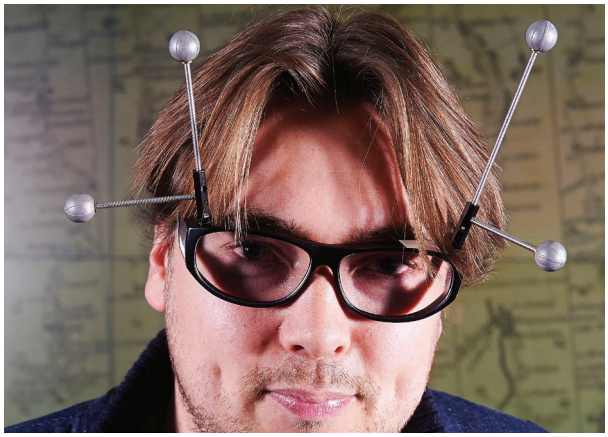
It's information that offers a unique insight into people's choices and viewing habits, as well as an invaluable perspective for museum curators and others who put together exhibitions. "We can measure responses of a given population to different materials, and fine tune things accordingly," says Clay. "It helps content providers put together better exhibits, which ultimately benefits visitors."

The University of Birmingham, together with Mechdyne Corporation has created a powerful and innovative facility that redefines not only the way museums present their exhibitions, but delivers a new and deeper understanding of the visitor experience.

Turning Visions into Reality

Taking the University of Birmingham's multifaceted vision and turning it into a functional reality is the product of an intricate collaboration between the University and Mechdyne Corporation, a leader in creating innovative, interactive visual information tools and technologies.

It's a collaboration that involves myriad perspectives from many divergent technical disciplines. And that, says Julien Berta, Mechdyne's VP of Technology and Innovation, is in itself a stimulating challenge. "Ideally, we want to get people to approach the process without focusing on technology at all. That's not easy to do, particularly with people who are all, themselves, very tech savvy. But we try to get them to focus on the larger question: what are they trying to achieve, and how will they measure success?"



"They came to us with a lot of great ideas on integrating technology into the museum experience," says Mechdyne Global Sales Manager Richard Cashmore. "What we tried to do was to listen to what they wanted to achieve — to have them sell us, if you will, on 'it would be really great if we could....' without getting caught up in the constraints of any given technologies. And one thing that came out of those conversations was the desire to gain insight into what people were looking at, what they liked, to create better and more interesting museums."

"Because we're not a manufacturer, we can be brand-agnostic, and focus on a solution, not a product."

Different Worlds Coexisting

If the technologies behind either level of user experience are intricate and complex, the challenge of integrating them into a cohesive whole adds an additional level of difficulty.

"In designing the system, we are essentially serving two different layers of users. The first layer is the visitor experience — the touch screens, the interactivity — and how we can create a unique and interesting environment that is both educational and easy to use," describes Berta."

The second layer is the researcher experience. While the school kids are in there learning about archaeology, the researchers can study their behavior, and learn what works and what needs to be improved."

For Both Users, a Familiar Interface

For visitors to the Hub, the experience has much in common with visiting a website online. Cashmore explains, "they might start by using their smartphone or device to sign in to Facebook or another social network and say 'I'm here at the museum.' They can walk up to a display and, if they like what is being shown,

they can look at their handheld device and it will display information on what they're seeing — much the same as if they hover over an image with their mouse. Then they can click 'Like' and it will post that on their social network page, along with a picture of what they were looking at."

"In a sense, we've turned a museum into a website," Berta observes. "Much of the experience is analogous to an online experience. You can think of each piece of content as a web page, and the researchers are counting page views, unique visitors, and other metrics and analytics — the same information that helps a webmaster understand why one page is important and another gets hardly any visitors.

"What makes it interesting here is that we're able to delve more deeply into the user's experience, and analyze that data on a far more detailed level. We can delineate by age or demographic, and tell you how many times someone has looked at a particular piece of art that day, that week, that month, how long they lingered, where they came from before that and where they went next. We're using the analytical power of the Web and applying it to a physical space, with digital content."

Today's Technology, Tomorrow's Experience

Certainly, the Hub has created a new and groundbreaking experience for museum patrons and researchers alike — environments that will shape the future of those who create exhibitions and those who visit them. But as Julien Berta observes, it's not the technology itself that is unique, but rather the implementation.

"What we are doing, in essence, is finding ways to accomplish new ideas with existing technologies. Arguably, putting touch screens on a wall in a museum is not new. What is new is

the way we are delivering the museum experience, and the way we measure the visitor's response to that experience."

For Mechdyne, the technology is just one aspect of a living, breathing collaborative relationship. "We're not in it to sell a system and leave," says Cashmore. "We consider ourselves partners in an ongoing creative dialog."

That ongoing dialog is a big part of what makes the relationship with Mechdyne work, says Dr. Clay. "It's a research project we're continually refining together. As new ideas and new challenges arise out of our daily use of the facility, Mechdyne is involved in discovering how to make the technology adapt to what we're aiming to do."

"Essentially, we've built a research instrument, the same way one might build a telescope or a particle accelerator," says Berta. "You are creating a scientific tool which, in itself, is a measure of immense complexity. Once you place it in the hands of scientists, there is no telling what the outcome will be. What will be discovered, what particular scientific advancements will be achieved using that instrument, that is something no one can predict. Our role is to create the most advanced instrument possible; what that instrument will accomplish is in the hands of the researchers."

"Conversely," he adds, "the feedback provided by the users of that instrument will help us to refine our design and create a better version of that instrument going forward. It's truly an ever-evolving process."

About Mechdyne

Mechdyne is one of the world's leading providers of innovative visual information technologies. Mechdyne bends technology to our will in ways that transform complex data into insights and ideas. To ensure our customers succeed, Mechdyne provides comprehensive, customized solutions that include consulting, software, technical services, and hardware integration.