

# Europe's first extreme resolution 3D immersive visualization suite

Some data sets are so complex it's hard to wrap one's mind around them. So Mechdyne and Alliance Manchester Business School implemented a 3D visualization facility that literally wraps data around the user.

# A VISION, REALISED

The University of Manchester's Alliance Manchester Business School (AMBS) provides world-class, industry-focused education to students across the globe. But it's equally renowned as a research institution – currently ranked 2nd in the UK for research power, impacting all areas of business and management, from accounting and health management to big data and human rights.

In an effort to further strengthen its research capabilities, in 2019 AMBS

brought all its research centres together in a new building expressly designed to fulfill on the school's motto of "Original Thinking Applied."

# Objectives

- Strengthen research capabilities
- Multi-use technology for campus-wide departments
- Single partner for design hardware & software integration, & on-going support



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A centerpiece of this facility would be a new centre for data visualisation, available not only to the business school but departments across the University.

AMBS knew it needed a technology partner to bring its vision to life – a provider that had experience not only with universities, but the range of industries to which the facility's research could be applied. Just as important, AMBS needed a total solution, from design and engineering through project management, construction, and integration, to ongoing maintenance and support.

A public procurement process was set by AMBS and The University of Manchester, which was won by Mechdyne because of the close fit of their solution to the requirements of AMBS, and the quality assurances inherent in their delivery processes. Guided by Mechdyne's Strive process of discovery, together we fleshed out use cases and desired capabilities, including remote learning and ways to achieve a truly immersive learning experience.

In addition, we worked directly with the architect and facility managers to ensure compatibility between the proposed solution and the space and infrastructure. Mechdyne also interfaced with IT to ensure that our solution integrated with the University's high-performance computing (HPC) infrastructure.

# A First For Europe

A year-and-a-half after our initial meeting, in the fall of 2019, AMBS announced the opening of the Data Visualisation Observatory (DVO). The first of its kind in the UK, the DVO integrates 72 full HD screens, enabling 3D visualisation of data with laser-sharp definition, in a 320° cylindrical matrix that surrounds users without confining them.

The DVO achieves a truly immersive visual experience through a combination of precisely integrated hardware and



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customised software, including getReal3D for Unity and Meeting Canvas 3.0.

Designed for image clarity, ultra-fast responsiveness, and flexibility of use, the DVO won immediate support from key stakeholders, including:

- Industrial partners for research funding and joint research
- A broad range of academic departments – including Engineering, Humanities, and Sciences – eager to expand their research capabilities
- Students who want to develop the data skills valued by employers

# A Unique Tool To Track COVID-19

Using a custom programme that combines geographic heat maps with 3D bar charts, the DVO allows health officials to track city-wide or regional spread of COVID-19 over time and identify possible contagion paths.

Dr. Qudamah Quboa, research associated at the DVO, explains: "A heat map enables you to see where the infections are highest, and you can also drill down to see how different factors might be leading to the spread of infections, such as maybe the presence of a large secondary school in a specific area."

The DVO also has the potential to create city simulations for locations far beyond Manchester. "In theory, we can create these maps for virtually any city in the world," says Dr. Quoboa.

# **Endless Applications**

The possible uses for the Data Visualisation Observatory are endless, whether it be providing high-fidelity interactive visualisations of very large data sets, capturing user behaviour in controlled immersive environments, or digital simulations of manufacturing processes and designs.

Though created by the business school, the DVO drew immediate interest from across the academic community. Among the areas of exploration proposed by researchers:



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- INDUSTRY 4.0: Simulating innovative mechanisms for the flexible routing of materials through a factory with a complex layout
- HEALTH SCIENCES: Visualising health data and immersive observations of brain signals and anatomical models
- ENVIRONMENTAL SCIENCES: Linking air quality simulations and real-time traffic flows to reduce pollution levels
- MARKETING: Observation of customer behaviour in a simulated retail environment under controlled conditions
- FINANCE TECHNOLOGY: Visualising monetary flows and stock market behaviours

The Data Visualisation Observatory also provides a one-of-a-kind environment for video-conferencing and information intensive brainstorming, and is designed for economical, easy operation by diverse users. It can display documents from any connected device, and is fully compatible with all popular conferencing platforms, such as GoTo Meeting.

### Flexible Design, Robust Capabilities

The large cylindrical workspace provided by the DVO is key to its usability. "It was essential to offer a space large enough for group work," says Mechdyne solutions architect Ryan Young. "It can even accommodate an omnidirectional walking surface, allowing for more realistic simulations than ever before."

The system's CAVE design is especially important in facilitating collaboration among users, adds Young. "Imagine gathering with your colleagues to analyze disparate datapoints. Multiple datasets can be displayed simultaneously so that people can see relationships between different data. In the DVO, researchers can literally enter the simulation and collaboratively examine and manipulate complex 3D models with natural interaction on a human one-to-one scale. The experience is immersive without being isolating or disorienting."



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#### A Powerful Partnership

AMBS chose Mechdyne as its integrator for a number of reasons – among them the Mechdyne team's investment in truly understanding what the University wanted to achieve, and their ability to offer a total solution – one that integrated hardware, software, service, and support into a seamless whole.

Just as important, AMBS had confidence that Mechdyne could help ensure the Data Visualisation Observatory's longterm success. "Mechdyne has the knowledge and resources, along with the support infrastructure, to optimize and evolve the facility over time. As hardware and software advance, we're uniquely well-positioned to incorporate those advances into the system," says Young. The ability to provide a solution that is flexible now and adaptable for the future translates directly to sustainable ROI for the client. AMBS knows Mechdyne will be there to translate their vision into a reality that immerses, engages, and inspires.

#### **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.



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