



## International Digital Laboratory

**location:**  
**University of Warwick**  
**Coventry**

Edward Cullinan Architects used a Design Quality Indicator (DQI) assessment to develop a fit-for-purpose building that met requirements of users from all parts of the organisation.

The new International Digital Laboratory is the second building constructed for Warwick Manufacturing Group at the University of Warwick. It was designed to develop digital technologies for learning and innovation in digital manufacturing through virtual product testing, research and education programmes.

Edward Cullinan Architects used a Design Quality Indicator (DQI) assessment to develop a brief which met the needs of users and ensured that the building could easily adapt in an industry where rapid development and change is inevitable.



### Introduction

The Warwick Manufacturing Group is a research centre for the development of innovation and cross-disciplinary collaboration in manufacturing products and processes. It is based at The University of Warwick with public and private partners in the UK and abroad.

The International Digital Laboratory is part of a regional development plan to reinvigorate industry, manufacture and enterprise and is part-funded by Advantage West Midlands. The building is designed to:

- demonstrate digital technologies which enable product testing
- develop virtual tools to enhance medical diagnosis and care
- facilitate innovative techniques for visualisation and e-security.

It also provides services for small and medium sized enterprises through advice and guidance in the use of new and emerging digital technologies.

### Exterior context

The International Digital Laboratory is the second building designed by Edward Cullinan Architects for Warwick Manufacturing Group. The first was the International Manufacturing Centre which sits at right angles to the International Digital Laboratory and shares a forecourt leading to university grounds and green spaces.

The main entrance to the International Digital Laboratory is on the first floor, accessed by a small bridge across a landscaped area from one of the main campus roads. The façade is dominated by blue brick and replicates materials used to construct the International Manufacturing Centre. The green sedum roof and the five white, high pitched roof lights contrast with the dark façade and soften the exterior aesthetic.

### Interior layout

The interior spaces are designed around a first floor concourse. This is a full-height space with informal meeting areas for staff, students and visitors. Bright colours indicate stairs and lifts which lead to open plan office spaces, meeting rooms and the IT and engineering equipment.



Specialist facilities include a sound room, a product testing suite, a lounge, teaching facilities and an auditorium. Work 'pods' on either side of the first-floor concourse are used for data analysis. These are directly connected to the ground floor where IT and engineering work takes place.

### Design challenges

The building had to be suitable to the needs of diverse user groups now as well as adaptable to changing needs in the future. Flexible floors and removable dividing walls were developed to provide an easily adaptable space and ensure long-term sustainability.

## **Design process**

### Starting the DQI process

Edward Cullinan Architects started the Design Quality Indicator (DQI) process to engage stakeholders in setting priorities and aspirations for design development of the International Digital Laboratory.

The DQI session took place at the briefing stage before any design development took place. It allowed a structured and measurable conversation about positive and negative aspects of the existing International Manufacturing Centre. This fed into the development of the brief and design for the International Digital Laboratory.

### Gathering the stakeholders

A client representative from the Warwick Manufacturing Group gathered stakeholders including:

- current users of the International Manufacturing Centre such as the receptionist, the systems manager and the facilities manager
- client representatives including the director of academic administration
- representatives from the estates office at the University of Warwick.

The DQI facilitator briefed the stakeholders about the reasons for holding the session.

### Running the DQI session

The facilitator drew on examples of successful and unsuccessful buildings to get stakeholders thinking about design and how it affects functional requirements and other aspects of design quality. By stressing the importance of good design, the facilitator empowered stakeholders to influence design through the DQI session.

The facilitator discussed each set of questions with the stakeholders as a group. Individual responses were also collected online. The group discussed the individual and cumulative results which showed different perspectives of the building and shared priorities to be pursued.

The DQI session ensured that respondents were recognised as experts in their specialist areas. It created a holistic picture of usage and ensured that all respondents had an equal voice and contribution to the outcomes of the session.

### **Evaluation**

The Design Quality Indicator (DQI) session addressed problems at the briefing stage so that they could be remedied in the design process.

“the DQI session left the architects with a good understanding of what we wanted ... we are the people who are left with the building in the end – we have the most at stake in ensuring the building is fit for purpose” ( manager).



“The comments made by clients were surprising and useful – the conversation which was structured around the questions was productive because all parties were talking about the same issues at the same time which opened up issues and ideas that we had not thought about before as a design team”.

### Informal and collaborative spaces

Two successful aspects of the International Manufacturing Centre design were identified in the DQI session. The shared common room facilitated informal collaboration and the open ‘conversation stairs’ were conducive to socialisation and maintaining good working relationships.

These elements were designed to reflect the main purpose of the International Digital Laboratory to champion cross disciplinary work and cooperation.

### Reception

By respecting users as experts in the DQI session, the architect gained an understanding of the specific requirements for certain spaces and re-evaluated their design assumptions.

The receptionist expressed her discontent with the design and functionality of the reception area at the International Manufacturing Centre. The “gold fish bowl” space cut her off from activity in the main building and isolated her from her own team. She also wanted control over entry into the centre.

The architects re-thought the layout for the reception so that the desk is in the central concourse space. The receptionist is now part of the main space, connected to activity going on in the laboratory and has control over the flow of people in and out of the building.

### Marketing strategy

The DQI session showed that the new International Digital Laboratory should be part of the marketing strategy for the Warwick Manufacturing Group and the University of Warwick.

Stakeholders felt that the building should “talk the right language” in design terms, create immediate visitor impact and have a professional feel to attract industry and academic institutions.

The session highlighted the need for a dramatic concourse space and demanded a design which questioned traditional academic closed office culture through use of open plan spaces. As the systems manager said “The new building reflects the need to attract industry specialists to an attractive environment where they feel comfortable to work in”.

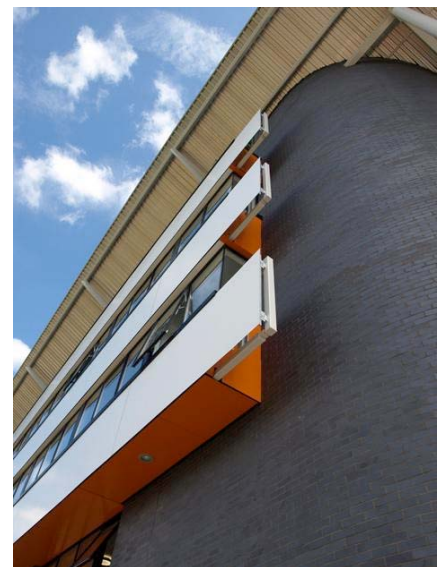
### Flexibility in design

The DQI session showed that the International Digital Laboratory needed to be future proof to accommodate rapidly changing digital technologies. This meant designing a flexible and adaptable space.

The systems manager required suspended flooring for flexible placement of electrical outlets and IT infrastructure. By placing these under the floor rather than in the walls, equipment could be installed at multiple points rather than being restricted to the edges of the space.

### Team work and shared learning

The DQI session clearly showed how individual requirements affected the other stakeholders and allowed the estates office to outline cost and time restraints on some aspirations. A senior teaching fellow said, “the DQI session allowed me to gain a better understanding of the whole building rather than just the parts that concern me”. Shared priorities were agreed so that the architect and client could prioritise them.



Representatives from the estates department usually hand new build projects to facilities management one year after completion. Here they revisited the International

Manufacturing Centre six years later and learned a lot from the dialogue with current users. These lessons have since fed into the development of other buildings.

### Lessons and moving forward

The design process for the International Digital Laboratory could have been even more successful if DQI had been used beyond the initial briefing session. Further DQI consultations with the same stakeholders could have evaluated the design before it was approved.

There are plans to revisit the International Digital Laboratory through a post occupancy DQI assessment. This will evaluate the success of the building and feed lessons into the development of new projects.

### **Key design features to look out for**

- exposed thermal mass and under floor heating to maximise energy efficiency
- natural ventilation through open plan space
- movement sensitive lighting and maximisation of the use of natural day light
- a sedum roof to reduce excess rainwater runoff and provide good insulation.
- a prominent central concourse space
- central tea and coffee making facilities
- multiple informal meeting areas around the building
- an open stairwell in the central core of the lab.

### **Link and downloads**

- The Digital Lab <https://digital.warwick.ac.uk/>

### **Contact for further information**

#### Lead architect/designer

Edward Cullinan Architects

#### Year completed

2008

#### Full address

International Digital Laboratory, University of Warwick, Coventry CV4 7AL

#### Location type

Out of town University campus

#### Client

Warwick Manufacturing Group, University of Warwick

#### Planning authority

Coventry City Council

Sources of funding

- University of Warwick,
- Advantage West Midlands
- Higher Education Funding Council for England

Total contract value

£13 million

DQI assessment in use

18 March 2006

DQI facilitator

Robin Nicholson

DQI respondents

- Facilities manager
- Project manager
- Systems manager
- Senior teaching fellow
- Head of academic administration
- M&E engineer
- Structural Engineer
- Quantity Surveyor
- Project Architect
- Receptionist