Capability Statement
Introduction

Co founded in 2010 by Northumbria University and Ryder Architecture, BIM Academy is a global centre of excellence for BIM and digitisation of the built environment. Through consultancy, research and training, we have built an international reputation as an independent, trusted support organisation for the real estate and infrastructure sectors.

For further information please conact:
Peter Barker
Managing Director
+44 (0)7909992414
peter.barker@bimacademy.global
We help transform our clients business through the intelligent application of smart processes and digital technologies. Impartial, research based expertise is combined with practical industry experience to deliver real value through the whole life cycle. We provide consultancy, research and training.

We maintain close links with all major software vendors but at the same time offer objective advice and support to organisations on their path to digital adoption and deployment, adding value and reducing risk. We have no hidden agenda. We start from first principles. We get under the skin of your business. We drive real value for you.
Services

Consultancy
Business performance evaluation, Business case development and feasibility study, research based user consultation, BIM strategy and implementation planning, gap analysis, SWOT analysis, FM strategies and deployment planning, expert advice and peer review, process and systems diagnosis, risk analysis and stress testing, company protocols and procedures, quality and environmental management processes, sustainable buildings and infrastructure consulting, energy and climate change services, environmental economics, sustainability and low carbon design best practice, staff development programmes, cultural change management, business performance measurement and KPIs, collaborative workshops (Virtual Project), Passivhaus and WELL Building consulting, Government Soft Landings (GSL), Post Occupancy Evaluation (POE), Design for Manufacture and Assembly (DfMA) and Off Site Manufacture (OSM) strategies, capability statement development, bid support, accreditation advice.
Management Services
BIM Level 2 and Information management (eg EIR, BEP, MIDP development), Invitation to Tender (ITT) support and evaluation, model management planning, staff mentoring and secondment, BIM project management, 3D model coordination and clash avoidance strategies, architectural design modelling best practice, construction simulation modelling (4D) and model based programme optimisation strategies, cost modelling (5D), digital room loading and room data sheets, design and construction management advice. Lessons learned and feedback reporting.
Technology Services
IT infrastructure evaluation, software assessment and research, bespoke software development, digital capture (LiDAR) and 3D modelling, 3D design model authoring and coordination, object library consultancy and creation, digital environmental analysis, computational design software analysis and development, data classification, data capture and validation, virtual and augmented reality, visualisation and animation, digital city modelling, model based embodied carbon assessment, open source IFC viewing technologies, Common Data Environments (CDE) and project collaboration systems, pedestrian movement simulation and analysis, use case development, legacy system analysis, reverse engineered solutions, systems integration, technical specification writing, system compatibility evaluation, 3D model reconfiguration for FM, GIS integration, RFID integration, data cleansing and regularisation, data migration strategies, asset data definition, COBie advice and support, data input support, software integration, data analytics and trend analysis.
Clients

We are proud of our work. We have helped our clients transform their working practices and achieve genuine value and reduce risk through the intelligent application of digital tools and processes. Our clients include:

“The support BIM Academy provided to the Council on live projects such as the Manchester Town Hall scheme was reflected in the Building Magazine Award for ‘Best Use of BIM’ in 2011. The Council acknowledges their expertise, knowledge and practical experience”

Liam Brady, Manchester City Council

“RIBA Enterprises and NBS have worked with BIM Academy on a number of key industry research initiatives which have borne considerable benefits in the advancement of BIM adoption”

Helen Whitfield, Executive Director, RIBA Enterprises

“BIM Academy combined technical excellence and industry experience to create a comprehensive technical specification for our bespoke BIM for FM solution”

Bob Moffat, Business Strategy and Planning Manager, Sydney Opera House

“Not only does it give us up to date images of the building in its current state which helps plan things such as the installation and upgrade of new services, but gives us accurate information on the building we have never had before.”

Tom Billington, Property and Facilities Manager, Durham Cathedral
Peter Barker
Managing Director

Managing Director at BIM Academy
BA(Hons), FRSA
Visiting Professor, Northumbria University

Role
Responsible for leading consultancy and commercial enterprise at BIM Academy, Peter has a construction industry background and as a Partner at Ryder Architecture, initiated and oversaw BIM technology and innovation within the business from 2003. Peter has over 30 years practical experience in leading and delivering projects in a number of sectors including commercial, education, healthcare, leisure, defence, process engineering, conservation and refurbishment.

Profile
Peter graduated with a degree in Classics from Leeds University in the early 1980s before studying architectural technology at Northumbria University. He joined Ryder in 1995 after several years in practice where he gained a solid grounding in technical design and design management on a range of complex and challenging process engineering projects which required diligence, responsiveness, proactive planning and cost control. Peter was responsible for research and innovation initiatives including Knowledge Transfer Partnerships with universities and was responsible and maximising the potential of new technologies such as BIM. Peter also developed and managed business systems including commercial, education, healthcare, leisure, defence, process engineering, conservation and refurbishment.

Relevant Project Experience
Sydney Opera House, BIM4FM project
M+ Museum Hong Kong, BIM management
Hong Kong Hospital Authority, Feasibility study on applicability of BIM
Midland Metropolitan Hospital, BIM strategy
Legal and General Homes Modular, BIM strategy and implementation plan
Dumfries and Galloway Infirmary, BIM strategy
Cleadon Park Primary Care Centre, Project Director
Wembley Park, BIM strategy and management
Greenwich Peninsula Riverside, BIM strategy
WRAP studies on BIM for resource efficiency
National BIM Library development
Brink Groep, Netherlands, BIM strategy
Carillion plc, UK BIM strategy
Abu Dhabi Midfield Terminal, BIM Execution Plan
Laing O’Rourke BIM and CDM working parties
South Tyneside College Redevelopment
South Tyneside and Gateshead Schools BSF
Redcar and Cleveland Grouped Schools PFI
Victoria Hall student accommodation
Bannatyne Fitness Health Clubs (30 UK wide)
Northumberland Academy and Schools
Scottish Courage Breweries, Edinburgh, Manchester, Newcastle
GKN Defence, Telford redevelopment
Build New York Live 2015, Overall Winner
Build Sydney Live 2013, Overall Winner
Build Qatar Live 2012, Overall Winner

Areas of Expertise
Business case development
BIM strategy and implementation
Systems analysis and reconfiguration
Project management
Technical design, procurement and delivery
Integrated management systems
Low carbon design and resource efficiency
Specification writing
Cost / benefit, risk analysis and stress testing
Health, safety and environmental management

Career Interests
Peter derives great satisfaction from understanding client needs and applying creativity and innovation to deliver solutions which bring value through enhanced productivity, quality and reduced risk.
John Lorimer
Chairman

Chairman and Consultant at BIM Academy
BSc Civil Engineering
Visiting Professor, Salford University

Role
In his former senior leadership role as a client and long track record in construction, John has developed strategy and implemented BIM on projects and programmes and understands the need to change culture, the importance of good procurement and how to build effective relationships with suppliers. Identifying and managing risk is fundamental to the successful roll out of BIM and John has developed a robust model business case for clients seeking to use BIM.

Profile
As capital programme director of Manchester City Council from 2002 to 2012, John led the procurement, management and delivery of the Manchester City Council £300m pa capital programme including the redevelopment of Manchester Town Hall and Library, the £500m Building Schools for the Future programme and social housing programmes such as 172 new build houses and apartments in West Gorton. John led the introduction of BIM within the authority including the town hall and library and on West Gorton (construction value £23m) which gave a 2.5 to 1 return on investment. John’s leadership in introducing BIM into the industry began in 2004 and he played a leading role in the UK Government BIS BIM steering group of which he was a founder member. Prior to his career at Manchester CC, John spent 30 years as a contractor on a diverse range of projects in the UK and overseas. He has been an operations director for major construction companies including structural engineering company Cleveland Bridge where he was based at the factory. He established and led a joint venture with BAE Systems.

Relevant Project Experience
Redevelopment of Manchester Town Hall complex and library
New build houses and apartments, Manchester
New build retirement homes, Manchester
New build houses and major refurbishment / remodelling to terrace houses, Manchester
New build and refurbishment to secondary, primary, and special needs schools
New leisure complex, Manchester
Commercial and retail developments in the UK
Suspension bridges in Hong Kong, China and Germany
Airport structures and power stations
A vast range of projects ranging from new dog kennels for the police authority to roads / bridges and care homes

Areas of Expertise
Developing business strategy and client business case
Leading culture change
BIM strategy and implementation planning
Linking BIM to facilities management
Programme and project management
Procurement
Supply chain management
Increasing efficiency through standardisation / prefabrication
Benchmarking

Career Interests
Founder member of UK Government BIS BIM steering group
Chair of Constructing Excellence Digital Theme Group
Client representative council member of the CITB collaborative working
Procurement strategy and implementation, managing the supply chain
Risk management
David Greenwood
Director

Professor of Construction Management
Director, BIM Academy
MA MSc FCIOB PhD

Role
David was an original co-founder of BIM Academy and part of the academic side of the joint venture, which he now serves as a director. He is a professor at Northumbria University where his main areas of research include the uptake of Building Information Modelling, construction supply chains and their organisation, management, and contractual administration. Before entering academia he worked for some 10 years as site engineer and senior estimator in the construction industry.

Profile
David graduated from Cambridge University and his postgraduate qualifications include an MSc in Construction Management (Heriot-Watt), and a PhD from the Department of Construction Engineering & Management (Reading). He is a Fellow of the Chartered Institute of Building and was a board member of Constructing Excellence North East from 2003 to 2007. He has authored over 100 publications and held research funding from the EPSRC, AHRC, and other UK and international government agencies. He has carried out training and consultancy for over 30 industry and professional organisations in the UK, continental Europe, the Far East, and Middle East, including the International Centre for Agricultural Research in Dry Areas (ICARDA) and the Egyptian National Housing and Building Research Centre, for whom he produced the ‘Green Pyramid’ Building Sustainability Rating System, Egypt’s first sustainable assessment tool for building design. He has previously chaired the Association of Researchers in Construction Management (ARCOM) and is a member of the Conseil International du Bâtiment (CIB) W117 (Performance Measurement) and TG80 (Legal & Regulatory aspects of BIM) groups.

Areas of Expertise
Adoption and application of BIM
Construction procurement and supply chain management
Project planning and risk management
Construction contracts
Sustainability

Relevant Project Experience
Innovate UK. “Tier2Tier: A collaboration interface between construction main contractors and their supply chain specialist sub-contractors” (2015-17)
Innovate UK. “DECC-MR: Digital Engineering for Customised Compliance in Maintenance Regimes” (2015-16)
Engineering & Physical Sciences Research Council, UK, “COPIC: Costs of procurement in the construction industry” (2002-05)

Selection of most recent relevant publications
Graham Kelly
Associate at BIM Academy
BSc (Hons), PhD, ABIFM

Role
Graham is responsible for leading strategy and implementation of BIM applications specific to clients' real needs. He has 12 years' experience in construction and academia, completing a PhD in appropriate feedback to architectural practices to improve early design decisions in 2015. Outside of work, Graham coaches American Football to international level and travels across Europe for competitions.

Profile
Graham graduated from Loughborough University in 2008 with a degree in construction engineering management and gained experience in industry working for Morgan Sindall and AMEC on a number of construction projects. Graham completed his PhD in 2015. Graham has specialist knowledge in BIM enabled facilities management, BIM Level 2 processes and procedures, architectural practice, feedback, knowledge transfer techniques and adaptability.

Career Interests
Graham has gained an interested in the theory and practical application of how effective feedback from facility management can aid an architect's future design decisions through his PhD. He is continuing to develop his knowledge in the utilisation of BIM within the operational phase of a building, hence aiding FM teams to improve the utilisation of their buildings. His aims are to progress in his career through the application of academic theory and practical experience on projects.

Relevant Project Experience
Sydney Opera House, BIM4FM project
Sydney Opera House, Model management plan
M+ Museum, Hong Kong, BIM for FM strategy
BAE Systems, Future Operating Model report for FM
Brink Groep, Netherlands, BIM strategy
Durham University, Estates BIM strategy
Leeds Beckett University, Estates BIM strategy
Greenwich Peninsula Riverside, BIM and FM Advisor
Durham Cathedral, BIM and FM
Carillion, Strategic implementation
Newcastle University BIM for FM strategy,
Laing O'Rourke, Dumfries and Galloway Royal Infirmary
Build Sydney Live 2013, Overall Winner
Eisai Headquarters, Hatfield
Astra Zeneca, Loughborough

Areas of Expertise
BIM for asset and facilities management
Scan to BIM and BIM for heritage buildings
Operational data integration
PAS 1192 Part 2 and 3 implementation
BIM strategy and implementation
Project planning and risk management
Architectural research
Facilities management
Adaptability
Whole life costing
Knowledge management

Publications
• Building Information Modelling: Protocols for collaborative design processes, 2014
• BIM in facilities management applications: A case study of a large university complex, 2014
• A theoretical comparison of traditional and integrated project delivery design processes on international BIM competitions, 2013
• BIM for facilities management: a review and a case study investigating the value and challenges, 2013
• Improving the design of adaptable buildings through effective feedback in use, 2011
• Improving the design process for adaptability: linking feedback and architectural values, 2011
Mark Crowe
Senior Project Manager

Senior Project Manager at BIM Academy
BSc (Hons) First Class

Role
Mark is a multi skilled and highly motivated team player who operates across a wide range of our consultancy, research and training services, including BIM project management, strategic advice and implementation planning, technological research, BIM for FM, 3D 4D and 5D modelling and management. Mark also played a role in the development of the National BIM Library, including expertise in Bentley AECOsim, Revit, IFC and ArchiCAD; delivering Revit training courses to a wide range of clients; developing our BIM for asset and facilities management strategy and ensuring BIM Academy remains at the forefront of technological capability and awareness.

Profile
Following work experience in architectural practice, Mark graduated with a First Class BSc (Hons) degree in architectural technology from Northumbria University before joining BIM Academy. Throughout his studies and his experience gained in industry, Mark has worked on a variety of projects ranging in scale and complexity, and particularly focused on delivering practical solutions that provide long term benefits to users. This approach influenced his dissertation research into social sustainability and the built environment which not only questioned how we evaluate projects post completion but how we establish end user requirements before construction.

Mark has always maintained a self driven motivation to investigate software to support innovation and efficiency in the built environment, having accrued expert knowledge.

Relevant Project Experience
Sydney Opera House, BIM4FM project
Sydney Opera House, Model management plan
Midland Metropolitan Hospital, BIM project management
Greenwich Peninsula, BIM project management
BAE Systems (Maritime Services) Portsmouth
BAE Systems MAI, RAF Marham
Sir Robert McAlpine, BIM training development and delivery
Tidal Lagoon Swansea Bay, BIM for FM strategy
National BIM Library development
Newcastle Civic Centre, BIM for FM modelling
Midlands Schools PFI, model authoring and coordination
Virtual Project workshops for contractors
Build Sydney Live 2013, Award Winner
Expert lectures for Northumbria and Newcastle Universities, Tsinghua and Jiaotong Universities in China

Areas of Expertise
BIM strategy and implementation planning
Autodesk Revit (Certified Instructor and Professional)
BIM for FM integration
Autodesk Navisworks, Cost X, Sefaira, Model coordination and validation, Bentley AECOsim, ArchiCAD
Industry Foundation Classification (IFC) /COBie

Career Interests
Mark is particularly interested in the broadening of the BIM scope to provide social, economic and environmental modelling, allowing designers to not only tailor projects to provide a real gain for their Built Environment but also to address the long term use of the buildings / site to ensure projects maintain or gain value post completion.
Mark Woodhouse  
Senior Project Manager

Senior Project Manager at BIM Academy  
BA(Hons) BArch RIBA ARB

Role
As an Architect, Mark is capable of engaging with BIM process and workflow right from concept design stage and is able to blend the design process with technology solutions and in depth understanding of IT infrastructure to facilitate a collaborative working platform for overall project delivery.

Mark is also able to provide well researched and detailed practical advice to clients on BIM and project management systems per project or corporate wide, as well as advice and support to project teams, designers, contractors and owners on all aspects of design management, document management, BIM capability, adoption of BIM, collaboration and building lifecycle management.

Profile
Mark graduated in architecture from Newcastle University and has over 20 years of international experience in collaborative project delivery, IT infrastructure and design applications. Moving to Hong Kong in 2003 led to 10+ years of experience in Asia coupled with extensive CAD / BIM workflow and project management for a top international design firm, operating across ten offices in eight countries.

Relevant Project Experience
As Regional IT Director for design organisations in Asia, Mark played a significant role in the initial opening, rapid growth and advancement of technology in design studios across the region Hong Kong, Shanghai, Singapore, Beijing and Kuala Lumpur – with projects across all sectors. Mark has also been responsible for technology adoption across several large scale project teams and has been involved on a range of projects including retail, mixed use, transport and hospitality as well as high profile commercial and corporate interiors. Specific roles have included overall BIM planning, project information management and collaboration strategies.

Projects Include:
- Project Management Systems & CDE:  
  Elements Mall (SHK/MTR), Hong Kong  
  Bluewater, Dartford, UK  
  BullRing (Hammerson), Birmingham, UK  
  Westfield (Westfield), London, UK  
  Ferrari World (Aldar), Abu Dhabi

- BIM Coordination:  
  ION Orchard (Capitaland), Singapore  
  Terminal 4 Changi Airport (CAG), Singapore  
  University Campus (LPU), Davao, Philippines  
  Eastgate Mixed-use (Taft), Cebu, Philippines  
  KERHQ, Hong Kong - cloud-hosted BIM

Areas of Expertise
- IT Infrastructure – Strategy and Implementation  
  Autodesk Revit and Navisworks  
  BIM Management  
  BIM Project Execution Planning  
  Design Management  
  Project Management and Governance  
  Risk and Value Management  
  Information and Knowledge Management
Kieran Stapleton
Senior Project Manager

Senior Project Manager
MSc Building Design Management and BIM
BSc (Hons) Architectural Technology

Role
Kieran is a highly qualified BIM specialist experienced in BIM management, technology, consultancy and training. Typical duties include project management, assisting in BIM strategy, protocol and workflow development, BIM execution planning, systems integration research, model audits, model authoring and object library creation, laser scan to BIM modelling, software and process training and contributing to online media and events. He is also a qualified Revit trainer.

Profile
Kieran achieved a Distinction in the MSc program in Building Design Management and BIM and a First Class BSc(Hons) degree in Architectural Technology at Northumbria University. During his studies he was awarded the CorePeople Recruitment “Best Achievement Award” and APM North East Branch “Highest Dissertation Award” for his efforts in his BSc and MSc respectively. As well as his academic background, he has worked within the built environment industry since 2005, starting as a student engineer for a large multidisciplinary practice, then developing and working as an architectural assistant at Ryder, an assistant project coordinator, a graduate architectural technologist, a 3D modeller / architectural technologist, a design management and BIM specialist before joining BIM Academy.

Career Interests
Kieran enjoys studying how to successfully integrate and manage the organisation and taxonomy of data and geometry to deliver maximum business value. He has published a paper for the 32nd eCAADe conference “Understanding technological interoperability through observations of data leakage in BIM based transactions”.

Relevant Project Experience
M+ Museum Hong Kong, BIM Manager
Highland Council Strategic BIM Implementation
Liverpool Football Club Model Audit Program
AMEC Foster Wheeler BIM Implementation
Carillion BIM Protocols Development
Laser Scan to BIM projects, Canada, Scandinavia
AMEC Guernsey Waste Treatment Facility
National BIM Library Object Authoring
Various Scan to BIM Projects
Howard Russell BIM Implementation
Webforum Peer Review for Software Developer
Owen Pugh Strategic BIM Roadmap
Build Earth Live: New York
Build Earth Live: Newcastle
Virtual Project Workshop Courses for Industry
Teaching Authorised Autodesk Training Courses
Teaching Northumbria University Degree Courses

Areas of Expertise
Autodesk Revit and Navisworks
BIM protocols (eg PAS1192, BS1192, AIA)
4D Construction Simulation
Tekla BIMsight
Graphisoft ArchiCAD
Solibri Model Checker
BIM Execution Planning
Design Management
Project Management and Governance
Risk and Value Management
Information and Knowledge Management

Consistently looking to improve workflow integration and interoperability, Kieran seeks to bridge the gap between theory and practice to optimise the value of BIM to clients and users.
Will Joske
Senior Project Manager
Bachelor of Architecture, University of Melbourne

Role
A registered architect based in Sydney and Melbourne, Will brings over 20 years of industry experience for BIM Academy in Australia. Will is joint lead for BIM Academy business development and consultancy services in Australia working closely with the base hub in Northumbria University, UK.

Profile
Will's involvement in BIM over the last decade has followed a number of parallel streams. First as an agent of change, working within organisations to align culture and business practices to derive benefit from BIM. Second has been to lead and manage the various tasks needed to produce BIM outputs to deliver value to organisations, including content, standards, training and research. Lastly, Will remains a hands on practitioner and Revit expert who continues to focus on what is possible, practical and achieve results.

Will's role arose from his BIM leadership for i2C Design and Management, an Australia based BIM enabled architectural practice working predominantly in the commercial and retail sectors and part of the Ryder Alliance.

Prior to these roles, Will worked in computer visualisation, tertiary architectural software education as well as commercial and residential architecture. Prior to i2C and BIM Academy roles, Will was Architectural BIM Leader at GHD, an international multidisciplinary engineering firm.

Relevant Project Experience
Strategic consultation and development role with John Holland on the asset information strategy for Metro Tunnel Project.
Strategic consultation role with Sodexo (bid stage) on the asset information strategy for Grafton Correctional Centre PPP.
Authoring and delivering BIM education events to professionals and students in various modes and venues.
Co author of ACIF and APCC initiative: BIM Knowledge and Skills Framework, designed to guide and assist industry stakeholders in the adoption and implementation of BIM.
Involvement in the delivery of multiple large scale, multiple stakeholder building projects.

Areas of Expertise
Strategic BIM implementation
Linking skilled professionals to BIM concepts and workflows
Project data management
Project planning and risk management
Knowledge management
Training authoring and delivery
Creative and practical problem solving
Revit architecture
Experienced architect

Career Interests
Throughout his career, Will has had a passion for three things: learning, teaching and how technology can be used effectively and creatively. This is the foundation for his approach to BIM, where success comes from breaking down the barriers to understanding BIM, aligning business processes, and finding solutions that balance practicality and innovation.
Alister Houghton  
Senior Project Manager

Senior Project Manager at BIM Academy
BDesArch

Role
Alister works across a number of consultancy, training and architectural services. This includes leading technical delivery of projects. He has a keen interest in BIM processes and procedures as well as an expert understanding of various softwares.

Profile
Alister joined Ryder Alliance partner i2C in 2008 whilst completing his Building Design and Architecture studies at Sydney University. During his seven years at the Australian practice he gained experience across a wide spectrum of architecture and specialised in retail. In 2015 he joined Ryder to broaden his career and personal experience. Alister enjoys immersing himself in additional educational, sporting and social activities and balances his work life with a love of the environment, especially while distance running. Alister is also fluent in Spanish.

Relevant Experience
UK
Midlands Schools PFI
Manchester Chamber of Commerce
Angel Gardens, Manchester
Virtual Project

Australia
Casula Woolworths Supermarket, NSW (New South Wales)
A typical Australian suburban stand alone supermarket. AU$8m build cost for 3200m² of rentable floor space and on-grade carparking.

Tura Beach Shopping Centre, NSW
A typical Australian regional shopping centre development servicing a growing coastal region. The AU$16m build cost included a medium scale anchor supermarket with expansion options designed in, ten specialty shops and on grade carpark.

Inverell Big W Department Store, NSW
4200m² big box retail department store with specialty shops in a growing rural community. A slightly more expensive build than usual at AU$12m to accommodate the lifting of the structure to accommodate carparking numbers on a tight site and avoid the flood zone of the adjacent river.

Fairfield Heights Supermarket, NSW
A typical Australian neighbourhood supermarket development to service a gentrified outer Sydney suburb. The AU$13m build included a medium scale supermarket, two specialty stores, a basement carpark and community area celebrating the history of the site.

Mackay Shopping Centre, QLD (Queensland)
Expansion of an existing neighbourhood shopping centre in a thriving regional mining town. At AU$10m the existing supermarket was expanded to 4000m² of rentable floor space, associated amenities added and additional carparking provided.
Claire Bowles
Stakeholder Engagement Manager

Role
Based in Melbourne. Business Development lead for BIM Academy ANZ. Claire has the ability to communicate across barriers, bringing together private, public and higher education consortia to work collaboratively on commercial and research projects. Her successful construction improvement advocacy projects engaged a diverse cross section of the construction industry and Construction Higher Education. Claire designed, developed and facilitated senior level BIM and Sustainability forums. Claire is an advocate for improvement in construction and acts as an ambassador for equality, collaboration, innovation and sustainability in construction. Claire also works as sustainability lead for i2c Design and Management, part of the Ryder Alliance group of companies.

Profile
Claire’s current role is as Business Development Lead for BIM Academy ANZ. She is an effective change manager and stakeholder engagement manager.

Claire was involved in engaging key stakeholders in the roll out of BIM in the UK, working closely with the Government BIM Task Group and private construction contractors and consultants. Claire is an improvement advocate and has introduced BIM into both higher education and professional training programmes internationally.

Relevant Project Experience
Stakeholder Engagement Manager for Matraville Memorial Park redesign project, Sydney
Project Lead for International Building Intelligence Conference 2017 in Hong Kong
i2c Air Quality Sensor Data collection Project, Melbourne
Project Manager for European / Egyptian TEMPUS BIM Project – sharing and dissemination of BIM best practice between EU universities and Egyptian Universities
BIM Trainer, CITB BIM training courses 2013-15

BIM Education
BIM curriculum development projects in partnership with private sector construction organizations and professional Institutes
BIM Training provider for the CITB BIM training courses across the UK

Areas of Expertise
Developing Project and Business strategy
Strategic BIM Implementation
Driving efficiency through process improvement
Stakeholder and Community Engagement
Green Star Accredited Professional (GSAP)
International Living Building Challenge Ambassador

Career Interests
Founder member of UK Living Building Challenge Collaborative
Member of International Women in BIM network
Member of Leeds Sustainability Research Institute
Member of Association for Project Management
Member of Constructing Excellence BIM Task Group
Biophilic Design and Health and Wellbeing in Buildings
Graham Coulby
Computer Scientist

Computer Scientist at BIM Academy
BSc (Hons)

Role
Graham’s role in BIM Academy is to apply computer science to optimise business systems and deliver enhanced productivity, client service and design excellence for clients. Although the primary focus of Graham’s role is software development, he has also been involved in consultancy, data management and research roles within the company.

Profile
Graham graduated with first class honours in Applied Computing at Northumbria University and was awarded the Ede and Ravenscroft Award for Academic Excellence in Computer Science and Design Technologies. Immediately after his graduation he was offered a research assistant role at the university, working within BIM Academy. This post led Graham into the world of BIM where he utilised his computing skills in a multidisciplinary team to solve problems within the built environment sector. Prior to his studies, Graham spent four years volunteering as an English teacher in a remote village on the west coast of the Republic of Georgia where he met his wife and began studying computer science and electronics. Graham is very methodical and has a strong understanding of BIM technologies as well as having a keen interest in software development and data management.

Relevant Project Experience
Sydney Opera House, Document management system development
Sydney Opera House, Spatial database system development
Legal & General Homes Modular, BIM strategy and implementation plan
Scottish Futures Trust, Queensferry High School - low carbon initiative
BAE Systems MAI, CAFM future operating model
Sydney Opera House, asset data migration strategy
Ryder Architecture and BIM Academy, model compliance tools
Ryder Architecture and BIM Academy, modelling efficiency add-ins for Revit
Northumbria University, DECCMR, Researching the Automation of Asset Classification
Northumbria University, Tier2Tier, researching asset identification using machine learning

Areas of Expertise
Computer science
Machine learning
Data science
Systems analysis
IFC
xBIM model viewer technology
Solibri model checker
Revit add in development
Website and web-app development
.NET development
Programming languages; C#, ASP.NET Java, C, XML, SQL, PHP and JavaScript

Career Interests
Graham is particularly focused on data management and the optimisation of business processes through digital solutions. He has a keen interest in applying his expertise in computer and data science to the construction industry. Graham is highly driven and aspires to become more focused on research projects that apply computer science and data science to change and ultimately improve the construction industry.
Tom Lawrence
Computer Scientist

Role
Tom’s role encompasses computer science research, software development, and combining Building Information Models (BIM) 3D geometry with data from various sources such as building sensors. Current activities include leading the software development in an Innovate UK funded project in association with leading computer scientists at Northumbria University, to focus on improving building monitoring and feedback loops by generating meaningful and actionable advice to householders, building and asset managers and the wider supply chain. Tom’s role applies computer science techniques such as machine learning and data science to solve complex problems and analyse large datasets including sensor data and geometry information.

Profile
Tom comes from a data and systems usability background. Working in outsourcing and customer experience he brings experience analysing a wealth of data to make recommendations and changes to processes and systems to improve customer satisfaction, operational performance and drive growth. Tom has always had an interest in computer science. After a career change he is now in his final year studying computer science at Northumbria University and on track for a first class degree. During his studies Tom has had the opportunity to work in the design, testing and implementing of large scale software applications for organisations such as the NHS.

Relevant Project Experience
Smart Connected Buildings research and development, Innovate UK
NHS, staff event and lottery management system
Parker Hannifin, asset management application
IKM Testing, stock control and reporting
KCC, sales and stock control
Virgin Media, departmental data analysis to highlight performance opportunities

Areas of Expertise
ASP.NET development in C#
Database design
SQL
JavaScript
Design patterns
Entity Framework
Computer science
Requirements analysis
Data science
Systems analysis
LINQ
Object orientated programming
MVC Framework

Career Interests
Tom has an interest in providing value through technology by streamlining processes and enabling smarter, connected solutions. Tom is highly driven in his goal to design and implement systems from a business and usability perspective combined with the cutting edge field of machine learning to give even greater insight into the wealth of data generated in the building industry.
Sarah Marshall
Technologist

Relevant Experience
BAE Systems (Maritime), BIM strategy and implementation.
Wolverhampton University, SOABE building, BIM management.
Park View Student Village, Newcastle University, BIM management.
Computer Information Sciences Building, Northumbria University, BIM management.
Sutherland Hall Refurbishment, Northumbria University, BIM management.
Newcastle University Sports Hall, BIM management.
Carillion Building, BIM workflow development
Prince and Princess of Wales Hospice, protocol development, Carillion
Lego factory, Hungary, model auditing and management.
Knight Dragon, Greenwich Peninsula, model auditing and management.
Scarborough Leisure Village, model authoring.
Lakeside Academy, model authoring.
Virtual Project collaborative BIM workshops, facilitation and training.
Revit training for industry clients.

Technologist at BIM Academy
BSc(Hons)

Role
Sarah delivers key BIM and information management roles for client teams. She has expertise in technical design and model and data authoring as well as 3D model and data audits and establishing common data environments.

Profile
Sarah graduated from Northumbria University in 2015 and following a brief spell at another practice, she joined BIM Academy and Ryder Architecture in Summer 2016. She is currently involved in several BIM and information management roles, where she is auditing the quality of the data and geometry. She has also established a number of common data environments. Sarah played rugby for the Northumbria University women’s team, where she captained in her final year, representing Northumberland County and Northern Regional Academy teams.
Thomas Lund
Technologist

Relevant Experience
Angel Gardens
The Heath School
Kepier School
Queensferry High School
Carré de Soie, Lyon
Premier Inn Sunderland City Centre Hotel
Grimsby Leisure Centre
Scarborough UTC

Technologist at BIM Academy
BA(Hons) BSc(Hons)

Role
Thomas provides BIM management roles for clients. He has expertise in technical design and model authoring as well as 3D model. He has a keen interest in understanding how organisations implement BIM within their current working practices.

Profile
Thomas completed his architectural technology degree between Copenhagen and Northumbria University, inclusive of a placement year where he worked on a range of projects including a leisure development in Lyon, France. His interests lie in using BIM software to maximise efficiency and working collaboratively, he has a specialism in Revit and coordination tools such as Solibri and Navisworks. Since graduating and joining BIM Academy and Ryder, he has been involved in a mixture of projects within the education and residential sectors. Outside of work, Thomas has a strong interest in Scandinavia, enjoys long distance running, cooking, and discovering new places to eat and drink.
Jackey Chan
Technologist

Relevant Project Experience
Kowloon East Police HQ, Hong Kong
M+ Museum of Art, West Kowloon, Hong Kong
Hong Kong University of Science and Technology, Queen Mary Hospital, Hong Kong
New Bridge Street Development, Newcastle upon Tyne UK

Areas of Expertise
Autodesk Revit Architecture
Autodesk Navisworks
Model Auditing, Validation and Federation
Clash Detection and Analysis
Architectural Detailing
Technical Design
Design Coordination

Role
An experienced architectural technologist by background, with 5 years’ experience in use of Autodesk Revit and other authoring platforms, Jackey also provides consultancy to industry on BIM protocols, model federation and auditing, data extraction and validation. Jackey specialises in working closely with the project team in the development of bespoke BIM execution plans, clash detection analysis reports and advising on design authoring in BIM software, model management and best practice.

Profile
Jackey is an experienced Technologist and Revit expert based in the Hong Kong team. He joined the practice in 2016 having gained an in-depth knowledge of BIM technologies on industry projects, including use of design coordination and analysis tools within Hong Kong companies such as Intelibuild and Luen Fung Contractors Ltd. Jackey originally graduated from Northumbria University with a degree in Architectural Technology before relocating to Hong Kong and applying his digital skills on complex projects in the region. Jackey is currently studying for a Master’s degree in BIM at Hong Kong University.
Scott Clark
Project Manager

Relevant Experience
Avon and Somerset Constabulary PFI
Newcastle Rail Academy
Best Practice Libraries, Ryder Architecture
Wick High School & East Caithness Community Facility
Midlands School PFI
Sisk / Lagan JV, A19 / Coast Road Highways Intersection

Project Manager at BIM Academy
BSc(Hons)

Role
Scott provides technical design expertise and BIM protocol guidance from the outset and throughout the project. He is also an expert in use of 4D BIM process software.

Profile
Following graduation from Northumbria University Scott has been involved in a mixture of projects at BIM Academy and Ryder, including education, office and public authority buildings and highways projects. His interests lie in promoting sustainability and One Planet Living as well as the effective use of BIM software. He is actively involved in driving BIM development and implementation and has gained valuable experience during a secondment to BIM Academy. Scott was the first staff ambassador to join Ryder Alliance partners i2C, spending six months in Sydney and Perth. Outside of the office, he enjoys travelling and following Bradford City football club.
Craig Dolan
Technologist

Relevant Experience
National BIM Library
Greenwich Peninsula Riverside
Park View Student Village
Lego Factory
Park View Student Village
Midlands Schools PFI

Technologist at BIM Academy
BSc(Hons)

Role
Craig provides technical expertise in BIM software tools. He has led a number of technical projects audits looking at the quality of modelling procedures.

Profile
Craig studied architectural technology at Northumbria University before joining BIM Academy and Ryder in 2013. His secondment to BIM Academy allowed him to significantly expand his theoretical knowledge of building information modelling and put this into practice on industry projects, including the development and authoring of the National BIM Library for NBS. He passionately supports charitable fundraising activities including supporting non-profit construction projects overseas and being part of the 2015 Prince’s Trust Million Makers team.
Mohamad Kassem
Associate Professor

Associate Professor in Construction Engineering
PhD, MSc, MEng (Hons)

Role
Dr. Mohamad Kassem is an Associate Professor in Construction Engineering and the Director of Enterprise and Engagement at the department of Mechanical and Construction Engineering at Northumbria University. Mohamad works with organisations from across the entire supply (Architects & Consultants, Contractors, Owners & Facility Managers, and Manufacturers) on strategic and operational BIM topics. He advises organisations about BIM policies, BIM implementation, BIM ROI, BIM compliance assessment and BIM technologies. He is supporting several committees and policy makers around the world, including an official role as a consultant appointed after a competitive shortlisting and selection process at EU level to the Brazilian Government with responsibility for developing a BIM adoption roadmap for Brazil.

Profile
Mohamad is an expert consultant and researchers with 10 years of experience in Digital Construction and BIM. Mohamad regularly works with a network of practitioners, organisations, researchers and HE institutions, within the UK and overseas. He has worked on BIM-related strategic and technical challenges with the Brazilian Government, BIM Excellence (Australia), Tsinghua University (China), Qatar Foundation, HOCHTIEF ViCon, Qatar Universities, Ryder Architecture (UK), Niven Architects (UK), BIM Academy, BIM Strategy, Colour Urban Design, Deepdale Solutions, Hodgson Sayers, Nymas, Sotech Optima, and several UK universities.

Areas of Expertise
Compliance assessment with L2BIM
BIM for collaborative and integrated design
BIM applications in construction management
BIM for asset and facilities management applications
BIM strategic implementation strategies & roadmaps
County BIM maturity assessment (Macro BIM adoption)
Serious games and VR applications in construction
Construction management, project planning and risk management, and H&S management

Relevant Experience
Brazilian Government, BIM Strategic Roadmap for Brazil
Ryder Architecture, BIM4FM process and technologies
Niven Architects, BIM for collaborative and integrated design
Colour Urban Design, BIM technologies and processes for Landscape design
Hodgson Sayers, BIM for manufacturing processes and integration with ERP
Sotech Optima, Industry4.0 approach to manufacturing
Qatar Foundation, HOCHTIEF ViCon and Qatar University, BIM Whole lifecycle information flow

Selection of Recent Relevant Publications
Sydney Opera House
BIM4FM Project

Following this initial project, the Opera House asked us to tender for the delivery of our technical specification. BIM Academy teamed with leading software developer EcoDomus, and global multidisciplinary consultancy AECOM, to tender and subsequently win the delivery of the BIM enabled FM platform. Rolled out over two years the project was executed in two stages. The first stage involved successfully retrieving and linking information from existing and new databases via the digital 3D model, while the second introduced a broader range of functional modules that can be added to the BIM interface over time.

What we did
Business analysis, structured research, information systems review, technical and IT infrastructure review, systems integration design, stress testing of potential solutions, model management planning, technical report writing, software delivery and implementation, user acceptance testing and training.

Key achievements
We translated the Opera House vision of a BIM for FM solution into a specification which could be realised in the market. We have delivered and implement a viable solution.

“As BIM Academy combined technical excellence and industry experience to create a comprehensive technical specification for our bespoke BIM for FM solution”

Bob Moffat, Business Strategy and Planning Manager, Sydney Opera House

Sydney Opera House
NSW, Australia

Description
BIM Academy beat international competition to win this major project providing specialist facilities management (FM) technical expertise for Sydney Opera House. In collaboration with the client’s Building and BIM Engineering team, we defined and developed a detailed facilities management specification to meet the building stakeholder needs for the existing building and its future development.

Development and implementation of a world class BIM FM solution improves operational and cost efficiencies to support greater visitor experience and will play a significant role in conservation and preservation, which support the Opera House’s cultural programme.

As part of our commission, we undertook detailed consultations with stakeholders on current and future needs; conducted a review of its current systems, processes and decision matrix; and created a detailed technical specification that defines the long term requirements. We also developed a detailed model management plug-in for the Revit model of the building. This has enabled the Opera House to start the implementation of a web based BIM4FM interface that will link a constantly maintained geo-spatially accurate model of the building to its engineering, maintenance and building control systems.
The Football Association Asset Information Strategy

The Football Association London, United Kingdom

Description
The Football Association (FA) are in the process of resurveying their two key assets, Wembley Stadium and St. Georges Park. They are interested in utilising BIM processes and technology to do this, to future proof their information.

BIM Academy were approached by the FA to support them in the creation of an asset information requirement (AIR) document. The AIR document stipulated what information they wanted on specific assets in a defined format. The overall goal is that the asset information can be directly uploaded into the FA’s operational systems. The FA wanted the asset information to be created in a standardised format. BIM Academy created the AIR utilising BS1192-4.

The AIR and asset survey project was put out to tender. BIM Academy supported the FA in evaluating the tenders for the delivery of the asset survey, this including reviewing bid documents and interviewing tenderers. The critical aspect was the use of technology to capture asset information.

BIM Academy are now supporting the FA in the delivery of their asset information strategy through peer review workshops and information audits during the asset survey.

What we did
Asset information definition workshop leading to creation of Asset Information Requirements (AIR) documentation, review of current information and systems, tender support, tender interviews, information management support.

Key achievements
Enabling the FA to specify their asset information in a standardised format and then ensuring the appointment of a competent supplier. We are now supporting the FA in the delivery of this asset information strategy.
Sultan Ibrahim Larkin Stadium
Digital Asset Information Strategy

Description
Sultan Ibrahim Larkin Stadium is a new stadium for the relocated Johor Darul Ta’zim FC in the Malaysian Super League. The 40,000 seater stadium has an estimated cost of 200M MYR and extends over a site 140,000 sqm with a total built area of 70,000 sqm. Chinese developer Country Garden Pacificview Sdn Bhd has been given the responsibility to build the stadium. Upon its completion, the new stadium will house the main squad of the club and will also incorporate the club’s headquarters, training centre and megastore. Construction commenced in 2017 with handover in 2018.

What we did
BIM Academy were commissioned by Country Garden Pacific View on behalf of the client to develop a strategy and oversee the creation of a digital asset information model, comprising a coordinated 3D geometry of the building fabric, structure and services, combined with non-graphical data on the maintainable building assets. BIM Academy worked closely with the project management, modelling and contractor teams to devise a strategy for the development of the geometric models and classification of asset data and means to combine this in a holistic digital information model for improved management of the building and infrastructure in use.

Key achievements
BIM Academy worked closely with the project management, modelling and construction teams on site in Johor Bahru and developed the BIM protocols which enabled the structured development of coordinated 3D geometric models and data for the stadium and its systems which would allow their integration with future FM systems (CAFM and CMMS) following handover. This has the potential to deliver high value in terms of operational efficiency and enhanced user experience. The project was developed in tandem with BIM Academy’s commission supporting Country Garden Pacific View’s Forest City smart city development in southwest Johor which involves the development of a similar approach which will be replicated across the entire development.
**BAE Systems**

**Strategy and Implementation**

**BAE Systems**

**Multiple Locations, United Kingdom**

**Description**

BAE Systems approached BIM Academy to undertake a peer review of the application of BIM processes and technologies for various divisions of their business. There was particular interest in leveraging BIM to enhance asset and facilities management activities as well as meeting the organisation’s obligations when working on projects subject to the UK Government BIM mandate and responding to emerging BIM requirements in international markets.

The initial project comprised a research exercise into organisational structures, capabilities and needs followed by the development of a proposed strategy. This then developed into a project developing a Future Operating Model for the business over 5 years. Activities included on-site business, technical systems and process discovery workshops with various departments and locations and production of reports with guidance for next steps.

The deliverables included a bespoke learning outcomes framework BIM capability development strategy. Both of these documents acknowledge two different strands of BIM implementation: internal projects and projects for third parties, both in the UK and internationally.

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**What we did**

Business analysis, structured research, information system review, organisational review, process mapping, gap analysis, SWOT analysis, employee interviews, and questionnaires, thematic analysis and coding, strategic report production, prioritised recommendations and action plan.

**Key achievements**

An independent appraisal of the business value of BIM processes and technologies and the relevance of BIM uses and how these should be applied. Clear and objective recommendations to maximise efficiency and productivity within the capital and operational program and across several subdivisions of the business. This took account of essential considerations such as security, structured learning and skills development and compliance with legislation and government standards.
Brink Groep
Strategy and Implementation

What we did
Business analysis, structured research, technical and information system review, organisational review, gap analysis, SWOT analysis, employee interviews thematic analysis, strategic report and implementation plan.

Key achievements
- Developed a corporate vision for BIM and an operational strategy for the delivery of BIM
- Completed a SWOT analysis and gap analysis
- Recommended a structured training plan.
- Developed a technology diagram showing integration of BIM software and relationships to business functions
- Showcased methods of demonstrating capability and expertise to clients
- Produced a method of assessing the competence and resources of the supply chain
- Developed a budget with indicative estimated costs for implementation including staff resource
- Provided examples of emerging best practice elsewhere in industry
- Identified pilot projects and a methodology for initiating them
- Created metrics to determine and measure the progress and effectiveness of BIM adoption.

Description
Brink Groep are a well established Netherlands-based property and project management group who commissioned BIM Academy to examine how the implementation of Building Information Modelling (BIM) within the group would enhance business growth and identify opportunities to expand into BIM-enabled services for the European property and construction market.

Following intensive research based in all the company’s offices, BIM Academy developed a strategy and implementation plan this began with a BIM enabled vision for Brink Groep, with an understanding of enhanced services and potential new clients for the Brink Groep companies. The new opportunities presented by BIM were identified and SWOT and gap analysis was developed. This was followed by a breakdown of opportunities and the key initial services and technologies Brink Groep should explore and recommendations of how these could be implemented. Finally budget costs were identified to assist the financial planning of BIM implementation. The overriding recommendation was that Brink Groep was well placed to be the market leader in delivering BIM processes through a whole life cycle approach and hence significantly increase turnover.
Carillion
Strategy and BIM Implementation

Carillion Building
Multiple locations, United Kingdom

Description
Carillion is one of the major construction and infrastructure services groups in the UK, with operations in N America and the Middle East. This detailed strategic review was commissioned to examine in depth the implementation of BIM technologies and processes to date to improve the depth and breadth of penetration of BIM across the building division of Carillion to deliver productivity gains and competitive advantage in the market.

The third party review started with six comprehensive project audits on a cross section of projects of various scales, complexities and sectors across the UK including Liverpool Football Club, Battersea Power Station, Yeovilton Airbase (Winfra), Royal Liverpool University Hospital, Liverpool Football Club and the King’s Cross P1 and Triplets Project.

What we did
- Interviewed key personnel at strategic and operational levels across several projects
- Redeveloped and updated Carillion’s BIM implementation strategy
- Reviewed key documents, software and hardware infrastructure.

Key achievements
We developed a report and recommendations that are now being adopted by Carillion in order to improve their BIM implementation moving forward and deliver enhanced value to the business in a very competitive market. We supported the Liverpool Football Club and other major project teams in ensuring the quality of the modelling on their projects.

- Facilitated workshops with key Carillion personnel and with software vendors on Carillion’s behalf
- Detailed a set of standard performance measurement metrics that could be used on Carillion construction projects and a methodology for deployment
- Visited and reviewed six Carillion projects identified by Carillion, including: Deansfield School, Battersea Power Station, Yeovilton Airbase (Winfra), Royal Liverpool University Hospital, Liverpool Football Club and the King’s Cross P1 and Triplets Project
- Audited the information models created on each site identified best practice and recommended systems improvements
- Researched and evaluated BIM competence assessments and accreditation schemes available in the current market and how these could inform improvements within the organisation
- Assessed available training and qualifications for the role of Information Manager
- Developed a report with recommended roadmap including prioritised process improvements, metrics and training program.
Durham Cathedral
Scan to BIM for FM

What we did
Laser scanning, scan to BIM digital 3D model creation, model configuration for FM uses, high quality visualisations. Building fabric condition coding within BIM model.

Key achievements
BIM Academy surveyed the building using the latest 3D laser scan (LIDAR) technology to produce 3D geometric images, known as point clouds with an accuracy of a few millimetres. After surveying was completed, the individual scans were processed to produce a single linked model of the whole building.

The point cloud was then exported to Revit, within which we modelled the entire building solely from the point cloud, before adding to the model data parameters tailored to client’s needs. This resulted in an central data rich model available for everyday use, as well as traditional outputs: sections and elevations, dimensions and volumes of ceilings and walls at no additional cost and within seconds.

This allowed the creation of condition surveys interlinked with models with the history of each element, creation of maintenance schedules, accurate stone surveying, visual walk-throughs, scaffolding simulation for refurbishment planning, scenario planning and simulation (eg plan an exhibition inside a room) field tool use utilising mobile technology to explore and update the model on site.

“Not only does it give us up to date images of the building in its current state which helps plan things such as the installation and upgrade of new services, but gives us accurate information on the building we have never had before.”

Tom Billington, Property and Facilities Manager, Durham Cathedral
Durham University Estates Department
BIM Strategy and Implementation

Description
Durham University Estates and Buildings Department procure, acquire, manage, maintain and operate around 370 built assets that host over 3,000 staff and 17,500 Students. The vision for the University’s estate and the landscape in which it is set is that it should be of a quality which befits a leading international university.

The main purpose of the project was to examine how to improve the implementation of Building Information Modelling (BIM) within Durham University and recommend a BIM enabled vision and BIM implementation Roadmap.

What we did
Our commission was to deliver the following:
- An analysis of the business value of BIM relevant to Durham University to inform decision making on potential BIM adoption
- A corporate vision aligned to the organisation’s business values and business plan, articulated through a mission statement
- An operational strategy including the recommended structure of revised management processes to be developed during the implementation phase
- SWOT analysis, identifying strengths, weaknesses, opportunities and threats.
- A gap analysis identifying areas requiring development to bridge existing deficiencies in skills, process and technology
- A structured training plan to support the realisation of the roadmap
- A technology diagram showing integration of BIM software and relationships to organisational departments
- Supporting information for the development of the internal process maps for capital and estate management
- Methods of assessing the competence and resources of the supply chain to deliver services to the revised standards
- An example Employers Information Requirements (EIR) document
- A budget with indicative estimated costs for implementation including staff resource
- Examples of current and emerging best practice elsewhere in industry
- Identification of pilot projects and methodology for initiating them
- Metrics to determine the progress and effectiveness of BIM adoption during the implementation phase and thereafter

Key achievements
The overriding recommendation was for the university to adopt BIM enabled processes to drive efficiencies in their maintained estate and capital programme.

In essence, the recommended long term strategy was to develop a digital representation of the campus in which the geometry of the estate is modelled with associated metadata about all maintainable assets, held in a consistently named format and linked to existing and future building management systems (CAFM, CMMS and BMS).

This digital ‘single source of truth’ will be at the heart the effective future management of the estate. It was acknowledged that such a transformation will not happen overnight and an incremental and prioritised approach was recommended with priority given to those sections of the estate with greatest business and educational impact.
Greater Manchester Chamber of Commerce
BIM Awareness and Skills Workshops

Description
BIM Academy joined forces with Greater Manchester Chamber of Commerce (GMCC) to create the concept of free BIM Awareness training for Small and Medium Enterprises (SMEs) in NW England.

Gaining funding from the European Social Fund meant that GMCC could raise awareness of the value of BIM upskill regional SME designers, manufacturers, clients and contractors in this field.

In early 2015 funding was been secured for 40 SME’s to receive BIM training and this was rolled out through ten one day courses in Spring 2015.

What we did
Working together BIM Academy and GMCC developed a course that would benefit all of the delegates taking part by introducing them to the basics of BIM and its potential business value, advancing to modules on the UK Government’s Level 2 BIM mandate.

From this the delegates learnt how a small investment in change management and upskilling of employees can benefit their businesses and the quality and value of their service offering.

Key achievements
There were a series of training sessions which were split into two sessions; morning and afternoon.

Session 1
Introduction to BIM, Evolution of BIM in the construction industry, BIM Maturity Levels The UK Government Mandate, BIM processes and uses, Multidisciplinary collaborative working and technical challenges, The BIM Execution Plan, Business self assessment, Brief guidance and provision of a self-assessment template to use following the course to assess your business’ next steps.

Session 2
An introduction to and awareness of the current requirements of Level 2 BIM, an introduction to and awareness of PAS1192 Part 2 and other Level 2 documentation and standards, The Common Data Environment, Employers Information Requirements, Introduction to COBie.

A wide range of managerial and technical staff with various levels of experience and knowledge participated in the sessions allowing them to engage with the information needed regarding the government standards.
Quintain / Knight Dragon
Greenwich Central Marketing Hub

Description
A prestige marketing and visitor facility set at the heart of a major urban regeneration scheme adjacent one of London’s iconic landmarks.

The Greenwich Peninsula redevelopment comprises a major high quality mixed use regeneration scheme by Quintain and subsequently Knight Dragon, in partnership with the Greater London Authority and the Royal Borough of Greenwich.

The 190 acre scheme is in a prominent riverside location adjacent the world famous O2 Arena and Canary Wharf financial district and comprises 3.5million sq ft of commercial space including retail and office space. 10,000 new homes which include high rise luxury apartment blocks and social housing.

The scheme also includes bars, restaurants and other entertainment alternatives, iconic attractions, infrastructure and transport integration, 48 acres of green space to include communal parks and greenspaces.

What we did
Developed client BIM brief, including Employer’s Information Requirement, Developed BIM Execution Plan, BIM workgroup leadership, Model management, model federation and auditing, software training, data property set definition for FM. Capability assessment of supply chain. Procurement advice and support. Peer review of the application of BIM processes and technologies.

Key achievements
The client understood the value BIM could bring to their project through improved quality of the end product reduced risk, improved transparency to the design process and the potential for operational efficiencies following handover.

In realising this vision, BIM Academy supported the client and project team, several of whom were at an early stage of BIM adoption, by establishing the right protocols and management processes, acting as client trusted adviser during the development of modelled information and providing support and advice as well as training where needed. As a result the contractor was able to adopt and develop the models to deliver improved coordination and quality control on site, including the use of the models by the contractor and specialist subcontractors to improve productivity and programme certainty.
Greenwich Peninsula Riverside
BIM Management

Quintain / Knight Dragon
Greenwich Peninsula Quays and Riverside Phases 1 and 2 London, United Kingdom

Description
A high quality mixed use regeneration scheme for Quintain and subsequently Knight Dragon in partnership with the Greater London Authority and the Royal Borough of Greenwich.

The 190 acre proposed scheme is in a prominent riverside location adjacent the O2 Arena and Canary Wharf financial district, comprising:
- 10,000 new homes which include high rise luxury apartment blocks and social housing
- 3.5 million sqft commercial space including office space and shops
- Bars, restaurants and other entertainment options
- Iconic attractions
- 48 acres of green space to include communal parks and greens

What we did
As the client advisor and BIM manager, BIM Academy:
- Developed the client BIM brief, including Employer's Information Requirements
- Developed the BIM Execution Plan
- Chaired BIM workgroup meetings
- Led the model management process
- Produced model audits and recommendations
- Carried out design coordination and clash detection
- Provided software training
- Supported with data property set definition for FM
- Provided capability assessment of the supply chain
- Offered procurement advice and support
- Undertook peer reviews of the design teams and contractors performance.

Key achievements
Recognising the value BIM could bring to their project through improved quality of the end product and reduced risk, the client also valued the improved transparency to the design process and the potential for efficiencies during the operational stage following handover.

BIM Academy actively supported the client and project team, several of whom were early adopters of BIM adoption, by establishing the right protocols and management processes, acting as client trusted adviser during the development of modelled information and providing support and advice as well as training where needed.

As a result the contractor was able to adopt and develop the models to deliver improved coordination and quality control on site, including the use by specialist subcontractors.
HM Government BIM Taskgroup
BIM Toolkit and Digital Plan of Work

“BIM Toolkit allows industry to enforce discipline and rigour across design and delivery that doesn’t exist at present”
Alistair Kell, BDP

“The Toolkit provides a common language across different infrastructure types and the ability to identify the documentation, the graphical data and the non-graphical data to be provided at each work stage by the supply chain.”
Terry Stocks, Ministry of Justice, HM Government

The toolkit provides step-by-step help to define, manage and validate responsibility for information development and delivery at each stage of the asset lifecycle.

What we did
Use case analysis and market testing, bespoke software development, data configuration, systems integration, product testing and user feedback.

Key achievements
BIM Academy were part of the development team alongside NBS, RICS, Microsoft, BDP, Mott MacDonald, Newcastle University and Laing O’Rourke. Billed as the “last piece of jigsaw in the UK Government’s Level 2 suite of BIM tools”, the BIM Toolkit is an interface that allows all project teams to interact with one another and state what work they will carry out at various stages of a development. The online resource guides project teams through their development of the project and its information requirements from the briefing and strategy stages to handover and operational stages and provides a guideline to get the most out of multidisciplinary Level 2 BIM.
Hong Kong Hospital Authority
Feasibility Study on Applicability of BIM

Description
The primary duty of the Hong Kong Hospital Authority is to deliver beds and high quality health services to the community of Hong Kong.

The Authority was faced with the challenges of an ageing population and an ageing building stock and in 2016 announced a major redevelopment programme.

The Authority recognised this is a challenging initiative and it must be proactive and innovative in seeking solutions to help deliver it.

The Authority commissioned BIM Academy to undertake this study to research the specific applicability and value of BIM and identify opportunities and timescales to apply BIM to deliver improved service and care to the community.

What we did
The study involved face to face interviews with a wide cross section of Authority personnel and external industry bodies and drew upon BIM Academy’s experience and research in the adoption of BIM in industry. Interviews with the external bodies particularly examined the readiness of the Hong Kong market.

The final report contained thorough analysis of the business value of BIM to the Authority’s activities, a clear understanding of the readiness of the market and a set of prioritised recommendations to allow the Authority to proceed.

Key achievements
We established that BIM can deliver great value to the Authority and there is capability in the local and international market to deliver the following services to support the Authority’s capital and maintenance programmes. In addition we advised on the contractual implications of BIM implementation and delivered BIM awareness training and software training to key Authority personnel.

- Improved design coordination through use of 3D digital models from each discipline to resolve potential clashes and errors at an early stage, to de-risk project delivery.
- Improved visualisation of the design through 3D modelling during early user engagements and regulatory approvals to achieve better user understanding, rapid sign-off and reduced time to market.
- Improved cost estimating and value engineering, based on quantities from digital models.
- Digital simulation of construction processes to optimise and programme and costs.
Howard Russell
Strategy and Implementation

Howard Russell Construction
Northumberland, United Kingdom

Description
Howard Russell are a UK regional construction contractor who had a vision to apply BIM processes and technologies to boost their business capabilities and value to clients.

BIM Academy supported the company in developing a BIM strategy and implementation roadmap including training and technical advice and support. We assisted in defining, delivering and maturing their organisation through the adoption and implementation of BIM workflows and procedures.

The intention of this commission was to aid in the acquisition of further construction work and ensure that Howard Russell Construction Ltd was prepared for the UK government 2016 mandate for Level 2 BIM Maturity. It was testament to the success of BIM Academy’s involvement that Howard Russell were successful in raising their profile and secured several projects and industry awards for their expertise.

What we did
Our approach focused on two of BIM Academy core business activities; strategic implementation and training.

Following an initial diagnostic workshop with a cross section of the client team, where recommendations for BIM adoption were proposed, BIM Academy instigated the development of the following:

- Mission Statement for BIM setting out business vision
- BIM Capability Statement to demonstrate skills
- Common Data Environment Assessment
- Employer's Information Requirements (EIR) template
- Pre contract BIM Execution Plan (BEP) template
- Post contract BIM Execution Plan
- Supplier Assessment Form
- Guidance in responding to BIM related prequalification questionnaires
- Organisational BIM Procedures

In addition, BIM Academy delivered training sessions in Autodesk Revit Architecture 2015, Autodesk Navisworks Manage 2015 and Tekla BIMSight to delegates from Howard Russell to assist in developing their hands on skills on BIM software tools.

Key achievements
With a focus on people, processes and technology we helped Howard Russell develop in house systems and skills to address the changing market and enhance their business offer. We developed a suite of documents that assisted progression to BIM Level 2 maturity, advised organisational best practice for the implementation of project level BIM. We also demonstrated and upskilled key members of Howard Russell team in the application of relevant software tools.

Howard Russell have since been short listed for the North East Construction Excellence award for BIM Project of the Year.
Kent County Council
BIM for Project Managers

BIM Academy outlined how the council and job roles could benefit from engagement with BIM on projects and what achieving this would entail; providing practical examples and application of these workflows.

Key achievements
- Provided an overview of industry standards and best practice
- Provided guidance on how to achieve BIM Level 2 following the UK government’s mandate
- Outlined the required processes and documentation that the Council would have to engage with and develop
- Advised how BIM could benefit the organisations roles
- Demonstrated a range of software tools available to the industry and advised on those functions that were critical to efficiency
- Demonstrated the collaborative processes and technologies which are key to the success of a BIM enabled project.

Kent County Council
Maidstone, United Kingdom

Description
Kent County Council, looking ahead to the developing market and the 2016 government mandate, engaged BIM Academy in 2014 to provide support and greater awareness of the BIM process for senior and middle council management, including project management and facilities management professionals.

Kent County Council’s project management and facilities management teams work on an extremely large number of projects and sites across the county and engage with a wide range of contractors and designers.

The Council recognised that the value of projects and assets managed offer significant opportunity for savings through engagement with more efficient workflows and available technology. Before procuring their first BIM project, they recognised the value in experiencing what this entailed, in a risk free environment supported by experienced industry professionals.

What we did
Following a similar format to BIM Academy’s acclaimed Virtual Project, the three day workshop was held at the council’s training facility to engage Kent County Council project managers and facilities managers in BIM processes and technology.
Leeds Beckett University
BIM for Estates Strategy

Leeds Beckett University
Leeds, United Kingdom

Description
Leeds Beckett Estates Services procure, acquire, manage, maintain and operate 108 built assets that host 2,900 staff and 29,000 Students. The estates strategy is to improve the condition of their estate, improve space utilisation and reduce carbon emissions.

The main purpose of the project was to examine how to improve the implementation of Building Information Modelling (BIM) within Leeds Beckett University and recommend a BIM enabled vision and BIM implementation roadmap. The project also examined the procurement of a new CAFM system and advised on how this could be BIM enabled.

What we did
- A review of Leeds Beckett’s current process and workflows
- Breakdown of BIM opportunities and recommendations
- Roadmap and indicative budget detailing how Leeds Beckett should implement the recommendations and future costs for the BIM implementation
- A corporate vision for BIM aligned to the organisation’s business values and business plan
- An operational strategy including the structure of revised management processes to be developed during the implementation phase.
- A SWOT analysis
- A gap analysis

- A structured training plan to support the realisation of the roadmap
- A technology diagram showing integration of BIM software and relationships to organisational departments
- Supporting information that was included in the information to tender (ITT) for new CAFM system
- Supporting information for the development of the internal process maps for capital and estate management
- Methods of assessing the competence and resources of the supply chain
- An example Employers Information Requirements (EIR) document
- Examples of current and emerging best practice elsewhere in industry
- Identification of pilot projects and methodology for initiating them
- Metrics to determine the progress and effectiveness of BIM adoption during the implementation phase and thereafter

Key achievements
The overriding recommendations for delivering BIM allowed Leeds Beckett to drive efficiencies out of their new and existing estate, through the maximisation of space utilisation, the potential reduction in carbon and enhanced user experience. It also positioned the university as leading the adoption of BIM within large estate owners in the UK. The industry is on the cusp of a significant digital change and Leeds Beckett can drive this forward from a client’s perspective.
Legal and General Homes Modular
Strategy and Implementation

Description
In 2016, Legal and General Homes Modular Ltd (LGHM) embarked on an ambitious programme to meet the needs of a UK housing sector which was demanding affordable high quality sustainable housing to meet the chronic undersupply in the market. Adopting a volumetric modular approach using Cross Laminated Timber (CLT), LGHM recognised that off-site manufacturing techniques and procurement processes could be streamlined by the intelligent application of digital technologies and commissioned BIM Academy to undertake an objective review of their current processes and establish a strategy and implementation plan to achieve an integrated digital approach.

Working closely with the LGHM team at their manufacturing facility in Yorkshire, BIM Academy studied the application of software platforms and workflows, applied best practice from their experience in industry and created a workflow aligned with appropriate software which could optimise the design, procurement, manufacture, assembly process.

The underlying principle adopted, aligned to UK government BIM policy, was that integrated data-rich 3D models derived from optimised object libraries will be developed and maintained as a single source of truth from project inception through off-site manufacture to site assembly and linked to procurement and cost management systems. The ultimate aim is to maximise value to the business and its customers.

What we did
Over a five month period, specialists from BIM Academy worked closely with the LGHM and retained design teams to evaluate design to manufacture processes and technologies and identified opportunities to streamline or reconfigure these workflows and integrate them with other processes such as estimating (Bill of Material automation) and procurement (ERP). The result was a comprehensive BIM strategy and implementation plan, with prioritised actions, supported by a BIM protocol to guide practical application on projects. A clear long-term vision was first established, to recognise the business value of BIM and clearly communicate the approach to be adopted. To facilitate this an early BIM awareness workshop was held to establish consensus and address any inconsistencies in understanding the relevance of BIM to the business and its context in UK industry, including the government policy on BIM Level 2. The workshop also covered the functionality and value of the commonly used BIM software tools. This was followed by a review of organisational structure, relationships with the supply chain and analysis of current design to manufacture processes and the technical systems applied to support it. This identified risks and opportunities which were clarified through SWOT and gap analysis and shaped into strategic recommendations and a BIM protocol. Technology diagrams showed interrelationships and dependencies between software which were then tested. This was supplemented with an evaluation of Common Data Environment (CDE) systems, supplier assessment, QA and model auditing protocols and a prioritised training strategy.

Key achievements
BIM Academy delivered a comprehensive strategy and implementation plan to support the digitisation of the design to manufacturing process as part of an integrated holistic process. This was accompanied with hands-on technical support from the BIM Academy data scientists who were able to advise on the sometimes challenging issues of interoperability between software and streamline workflows which would otherwise have become overcomplex.
M+ Museum of Art, West Kowloon
BIM Management

West Kowloon Cultural District Authority
M+ Museum of Art
West Kowloon, Hong Kong

Description
The HK$4.7 billion M+ Museum is the result of an international design competition held in 2013 and won by Herzog & de Meuron, TFP Farrell and Arup.

M+ is the new museum for the 20th and 21st century art and visual culture in the West Kowloon Cultural District (WKCDA). It is an ambitious project, to create a museum on the physical scale of the world’s largest museums of visual culture, aspiring to over time attain an international status comparable to that of MoMA in New York, Centre Pompidou in Paris or Tate Modern in London. It aims to be a museum rooted in and shaped by its location and the unique culture of the city.

WKCDA has shown vision in demanding the use of BIM and a Common Data Environment throughout the life of the project, to improve project communication and collaboration amongst design team, stakeholders and contractors and ultimately support asset and facilities management (FM) during operation.

What we did
BIM Academy were appointed to the subconsultant role of BIM Specialist to support and advise the M+ design team Joint Venture of Herzog & de Meuron, TFP Farrell and Arup. This BIM specialist role was to coordinate and facilitate the production and management of Building Information Modelling activities throughout the design stage of the project, together with provision of clash detection and analysis peer review at key milestones. Our role included the development of BIM protocols and the BIM Execution Plan and leadership of BIM workgroups. We also undertook model management, including federation, auditing and clash detection.

Post-contract, BIM Academy were appointed by Hsin Chong Construction as BIM Manager for the construction phase. Based on site since construction activities commenced this highly responsible role involved the coordination with the contractor’s discipline leads and subcontractors review and analysis of design team information and the development of production information including Combined Services Drawings (CSDs) and Combined Builders Works Drawings (CBWDs) from the digital 3D modelling processes. In addition BIM Academy led the development of 4D construction simulation models and advised on the structure of models and data for the Asset Information Model (AIM).

Key achievements
• Facilitation and leadership of BIM workshops with the design team and client in Switzerland and Hong Kong
• Analysis of design team capabilities
• Analysis of client’s information and requirements. Creation of project BIM and collaborative working standards
• Authorising of project model Level of Development (LOD) and responsibility matrix
• Advice to JV partners on best practice and BIM working methodology
• Advice to the WKCDA via the JV regarding the Authority’s BIM and CAD standards
• Revit model auditing against the BIM Execution Plan
• On site BIM management during construction, including model federation and clash detection reporting and model based production information, including 4D construction simulation to support logistics planning during construction and close liaison with construction management team.
Manchester Central Library
BIM Consultancy

Manchester City Council
Manchester Central Library
United Kingdom

Description
The £170M comprehensive refurbishment of a Grade 2* listed building as part of the larger redevelopment of the town hall complex. Constructed in 1934, the 172,000sqft building had suffered from progressive structural failure, time expired systems and fabric and high asbestos content.

This challenging project was seen as a catalyst for BIM adoption by Manchester City Council. The local authority saw significant benefits in ultimately using the model to manage the completed facility as well as efficiency benefits during design and delivery stages.

The project was a pathfinder for progressive BIM adoption across the authority’s property portfolio. The project commenced on site in 2010 and was successfully handed over in early 2014.

What we did
Strategic BIM planning, independent client advisory role and peer review, implementation support to design team and contractor.

Key achievements
Originally part of the Ryder Architecture project team, BIM Academy worked with Manchester City Council client team from project inception in 2009 to develop the strategic vision for BIM on the project and plan its implementation.

This included supporting the consultant team in understanding relevant BIM uses and their practical application, engaging external specialists and software vendors where required and advising the client during contractor selection. During construction stage we have continued to facilitate the implementation of BIM uses for design coordination, logistics planning and asset management.

A key component of the project’s success was that the project was managed in a truly collaborative environment with a fully integrated project office. This environment, coupled with the client’s experience over the past seven years using framework arrangements, allowed the team to cut across many of the perceived obstacles to BIM adoption, such as ownership of the model and contractual liability and management of risk.

Applying BIM to a complex refurbishment when the industry was at the beginning of its learning curve was a challenging, but ultimately successful, enterprise.

The benefits accrued in terms of improved efficiency, safety and asset management are testament to the team’s tenacity, practical knowledge of BIM technologies and collaborative ethos.

The project was closely monitored by the UK government BIM working party and was praised as ‘Most BIM friendly Project’ by Building magazine in its ‘Projects of 2011’.

“Trying to explain this two-dimensionally to English Heritage was almost impossible, we had workshops and using the model built it up piece by piece to identify exactly how much structure we needed to take out.  BIM was a great advantage”

Graham Fenton, Laing O'Rourke.
Midland Metropolitan Hospital
BIM Management

Description
Midland Metropolitan Hospital is a £280M new, state of the art acute hospital for the 530,000 people living in Sandwell and West Birmingham in the UK. It is set to open in 2018/19.

Following the submission of an OJEU notice to kick start the procurement process in July 2014 and a pre-qualifying questionnaire, a shortlist of bidders was identified. An Invitation to Participate in Dialogue (ITPD) was issued in 2014 and Carillion and Laing O’Rourke/Interserve progressed their interest in the tender process on the project. The next key milestone was the submission of final bids, which occurred in Spring 2015.

BIM Academy supporting the successful contractor and their design team through bid and the design development stages.

The Health Trust recognised the value BIM can bring to the project, particularly in the area of stakeholder engagement as well as the benefits through improved design coordination and programme optimisation and asset management.

In addition Sandwell Council developed an initiative known as the West Midlands Virtual Hospital (WMVH) as a means to engaging the local supply chain using a digital model of the project.

Behind the scenes, the council worked hard to ensure local SMEs were skilled, confident and qualified to bid for the hospital work and BIM Academy supported this initiative though work with the supply chain. The local authority partnered with BIM Academy and the main contractor to hold free BIM workshops around the region.

What we did
Bid support, BIM execution planning, model management, including federation and auditing. Data property set definition for FM. Peer review and performance assessment for the contractor.

Key achievements
- Developed BIM vision and strategy based on outline brief
- Assisted in development of Employer’s Information Requirements (EIRs)
- Created the BIM Execution Plan (BEP)
- Developed bid team BIM capability statement
- Assessed opportunities for innovative BIM uses and wrote report
- Developed BIM for Asset Management proposal
- Undertook model audits
- Led BIM workgroup meetings and presentations
- Developed BIM for FM integration strategy
- Raised BIM awareness for local supply chain through workshop presentations
- Peer review and performance assessment for the contractor.
MTR Corporation
BIM for FM Pilot Project

Description
A pilot project undertaken on behalf of Hong Kong Mass Transit Rail Corporation (MTR). The purpose was to investigate the feasibility and business case for collating and linking asset data from various 3D digital and 2D conventional formats derived from ongoing rail infrastructure projects and migrating this data to the corporation’s asset and facilities management systems.

The study also investigated the business case and return on investment for adopting this approach on future projects.

What we did
BIM Academy were invited by MTR to develop a pilot project to demonstrate how disparate asset management data could be accrued from existing 3D models and 2D document formats produced as part of ongoing programme to extend and develop the rail network in Hong Kong and then integrated this with the Corporation’s computer aided facilities management (CAFM) systems.

BIM Academy worked closely with Ecodomus and the client to source 3D geometric models, metadata and documents from the construction and maintenance team working on the Kwun Tong Line extension, in particular a section of tunnel track and signalling systems and the Wiley Road Ancillary Building. Our team then reconfigured the data nomenclature and hierarchy for compatibility prior to successfully testing the migration of data to the client’s CAFM systems.

Also as part of the study, BIM Academy studied the business case for adopting such an integrated BIM for FM solution and were able to demonstrate practical savings in time and cost in relation to the response times and efficiency of the operational teams.

Key achievements
The pilot project has served as a demonstrable proof of concept and delivery for the further expansion of the BIM for FM approach across the Corporation and demonstrates the feasibility of applying BIM methodologies to infrastructure projects.
Newcastle City Council
Estates Modelling

Newcastle City Council / Your Homes
Newcastle, United Kingdom

Description
Following development of Northumbria University’s estate BIM model, Newcastle Civic Centre asset and facilities management team approached BIM Academy to advise them on how to develop something similar and how to drive value from this developed asset information.

Newcastle Civic Centre was opened in 1968 and is a Grad II* listed heritage building. As a result the building presents two particular difficulties for management;

Firstly all the listed elements of the building need to be managed and tracked to prevent damage or removal during the buildings extensive refit. Secondly the building contains asbestos which not only requires extremely careful management but also results in significant costs for repeated surveying works.

Your Homes Newcastle manages 30,000 homes across the city on behalf of Newcastle City Council and a number of other housing trusts, including being involved in the procurement of additional properties within the Council’s estate. Your Homes Newcastle engaged with BIM Academy at the suggestion of Newcastle Civic Centre with the desire to investigate more effective ways of managing their extensive estate.

What we did
BIM Academy engaged with both organisations to raise their understanding of the value BIM could and the specific opportunities to deliver this.

BIM Academy identified that the current asbestos surveying processes within each organisation were extremely costly and delivered little value. It was demonstrated that asbestos records could be delivered directly into respective 3D asset models allowing more accurate, understandable and useful information to be developed that wouldn’t as a result require as extensive continuous resurveying. This additionally led to BIM Academy’s engagement with a number of asbestos surveying providers.

The Council team were trained by BIM Academy in the Revit Architecture to begin development of the core of the Civic Centre building. Following development of the model, the team took over modelling of the building with support provided as requested.

A model of a series of apartment blocks were developed for Your Homes Newcastle to demonstrate the ability to aid in the management of voids as well as to allow planning of reworks and regeneration of assets. The models developed provided for a significantly improved record of the buildings and the managed assets.

Key achievements
Developed model authoring skills within Newcastle City Council.
Developed asset information models for a number of existing assets.
Worked with clients to gain accurate information on existing estate.
Developed process for recording asbestos information in a more accessible and usable way.
Developed process for recording and tracking listed building elements more effectively.
NewcastleGateshead City Model

Virtual NewcastleGateshead
Newcastle upon Tyne, United Kingdom

Description
Virtual NewcastleGateshead (VNG) is a joint venture between Northumbria University, Newcastle City Council and Gateshead Council to create a three dimensional digital model of the urban areas, around Newcastle and Gateshead.

The VNG model offers a unique opportunity by providing developers and architects with the means to accurately assess the impact of design proposals within their urban context.

The model also supports VNG’s host partner, Northumbria University, in their research activities into city modelling and spatial data management and manipulation. The project, managed jointly by the three partners, has analysed the benefits that the model will bring to a range of stakeholders and is researching into the latest digital and computing technologies to create a more efficient and effective way of achieving better design quality. It aims to place Newcastle Gateshead at the forefront of virtual city modelling.

What we did
The model to date is based upon aerial photogrammetry and laser scanning survey techniques. The future will require the model to be based upon a database structure to facilitate regular update procedures and efficient management. Northumbria University’s current research is investigating how developments in Building Information Modelling could be used to update the model and open modelling standards such as CityGML, Collada and the Industry Foundation Classes are being used to develop a semantically rich and extensible database structure.

Key achievements
The aim of the VNG project has been from the outset to seek ways to create one definitive, accurate, interactive model of Newcastle and Gateshead with the potential to be used for a range of applications. It has recognised that in order to be successful and sustainable a digital model needs to be effectively managed, regularly updated, and integrated into existing working practices and processes. These organisational requirements are as important as having appropriate technical solutions in place.

“The Virtual Newcastle Gateshead City Model provided a platform for many uses from design development and improvement through to promotion and marketing”

Michelle Percy, Director, Silverlink Holdings Ltd
Commissioned by RIBA Enterprises (NBS), BIM Academy were responsible for scoping and authoring National BIM Library as the UK’s first platform neutral, free to use library of high quality generic and proprietary BIM objects, data rich, best practice generic and proprietary BIM components for use by industry professionals. The library is available online and enables designers, contractors and other construction professionals to locate and download generic BIM objects for a wide range of systems and products.

All objects are available in IFC and the main BIM software file formats. The objects contain parameters derived from industry best practice including COBie to support asset management.

Following its initial launch in 2012, the generic library has been joined by a substantial list of proprietary manufacturers’ objects which have also be scoped and authored by BIM Academy as part of NBS specialist supply chain.

**What we did**
Research and scoping of requirements, consultation with manufacturers. Data property set definition.

Generic and proprietary object authoring in multiple native formats (Revit, ArchiCAD, Bentley AECOsim, Vectorworks) and IFC. Interoperability testing. User manual authoring and object maintenance.

**Key achievements**
BIM Academy played a leading role in the creation of this essential source of digital information for the supply chain to aid the construction industry in BIM adoption. The library promotes the application of consistent quality standards to support data continuity and reliability throughout the entire project lifecycle.

“We commissioned BIM Academy due to our confidence that the team work between BIM Academy and NBS would be able to do some pretty special things. BIM Academy combines practical experience from Ryder Architecture with their application of BIM in industry since 2003 and Northumbria University with their academic expertise, software skills and bespoke IFC tool kits”

Stephen Hamil, Director of Innovation, NBS
Sir Robert McAlpine
BIM Skills Development Programme

Multiple Locations
United Kingdom

Description
BIM Academy was approached by Sir Robert McAlpine, the major UK based contractor, to create a bespoke skills development training programme for their UK business. Scoping took place through workshop style sessions which allowed staff in different roles and backgrounds in the McAlpine business to take part and work out what they wanted to gain from the BIM courses and how this should be structured. Four completely bespoke programmes were then created by BIM Academy through analysis of the results from the workshops and trial runs of courses.

The feedback gained from these sessions and demo courses allowed the final four course outlines and content to be created and then delivered to approximately 100 staff over a one year period.

BIM Awareness – introductory course for all
BIM Management – for design and project managers
BIM Commercial – QS and estimators
BIM Planning – for construction managers and planners

To make the training more interactive and to allow the staff to get involved with the training, the use of a ‘virtual project’ format was constant throughout the two days. This allowed staff to work through a project scenario and visualise and understand the application of the information they were being trained on.

What we did
Bespoke skills development and training programme for major contractor, including all disciplines - design management, QS, construction management and planning.

Key achievements
McAlpine staff can now work practically and effectively on projects utilising BIM skills. They can apply their knowledge of BIM and understand the implication of BIM government mandates on both public and private projects. The benefit is the reduced risk on projects and the increased benefit to McAlpine and their clients. The two day workshops involved a combination of hands on technical tool training, didactic teaching and workshop based discussion. We utilised voting buttons as a key part of the training.

BIM Academy has received extremely positive feedback from McAlpine staff taking part in the training programmes. With most responding with excellent or very good ratings. BIM Academy were subsequently retained by McAlpine to develop and repeat delivery of the training in the subsequent year.
Multiple Clients
Virtual Project

Multiple locations - UK, China, Australia

Description
As a centre for excellence, BIM Academy is supporting the UK and other governments BIM strategies to deliver value through reduced cost, improved programme certainty, reduced carbon emissions and safer environments. BIM Academy has developed an innovative, engaging and collaborative multidisciplinary course to allow industry professionals to experience the value of BIM.

Based on a sample project, this is achieved through workshops, demonstrations and hands on training to experience the benefits of using BIM processes and software tools for design, construction and operation.

The intensive course is designed to allow a project team or organisation to experience BIM in a real time collaborative environment. It enables participants to explore the BIM process and software tools with few of the risks or costs which the uninitiated could encounter on a real project. The two or three day course is delivered by a multidisciplinary team of experienced and skilled practitioners at any suitable location.

What we did
Virtual Project encompasses a range of practical and engaging techniques such as presentations, demonstrations, workshops and software tools training to support the delegates. The course begins by teaching the basics of strategic BIM implementation, explaining government and client strategies including UK Level 2 BIM which was mandated on all public projects in UK in 2016.

Our tutors then demonstrate how to plan a BIM project, starting with an employer's information requirements (EIR), then developing a BIM execution plan (BEP) and detailing how deliverables will be achieved.

Delegates then progress through the design process engaging a variety of available software tools to support delivery, but most importantly, working in a cross discipline collaborative team, following considered processes in the most effective way possible.

Our experienced staff are on hand throughout the full course to support the delegates and answer any questions that arise. Finally delegates present back to the tutors their project identifying where they have gained benefit from the process and what they will be taking back to their respective organisations and peers.

Key achievements
Delivery of practical and rewarding experience of the BIM process. Provides a unique multidisciplinary learning experience. Provides a safe and risk free opportunity for experiencing the BIM process. Gives visibility of a wide range of BIM software tools to support efficient processes. Delivered off site at client locations.

“The team not only enjoyed it but now feel well prepared to discuss, champion, promote and use BIM as an FM tool wherever they can. It is not often training can motivate and capture the creative imagination of so many people from different professional backgrounds.”

Tony Smith, Managing Director, Mears FM Group

“Worthwhile, important for the future, groundbreaking”

Andrew MacIver, Highland Council
**Newcastle University**  
**BIM for Estates Strategy**

**Newcastle University**  
**United Kingdom**

**Description**  
BIM Academy were invited by Newcastle University Estates Support Services (ESS) to review the relevance of BIM processes and technologies to the university estates department’s day to day activities and future strategy and to prepare a high level needs assessment, gap analysis and adoption strategy for consideration.

**What we did**  
Organisational and operational review, estate strategy review, analysis of existing information systems, software and skills, identification of improvements, proposal for potential BIM uses, option appraisal and prioritised recommendations and risk analysis.

**Key achievements**  
As the owner of a diverse portfolio of property types including several heritage and complex technological facilities, the client understood the potential value of utilising BIM across the entire estate, both on its new capital program or existing estate. At the time of commission however they did not know how to start implementing BIM in a structured manner within their interdependent processes. Our research and subsequent report detailed a series of practical and pragmatic steps to introduce BIM based on an estate wide strategy.

Some of the benefits explored, included integration of disparate existing information systems such as the BMS, planned and reactive maintenance CMMS and CAFM systems, helpdesk and room booking systems Streamlining the management of the asset register (including drawing records) was also explored as this could be centrally controlled through the graphical 3D model rather than individual drawings and schedules. A coordinated 3D graphical model of each building element or facility in the estate could be captured using scan to BIM or 2D to 3D conversion processes and, supported by GIS technology, could be linked, spatially coordinated and adopted as a placeholder model. Combined with a single consistent data structure and transfer mechanism this would inherently improve the efficiency of the management of data throughout the operational life of the estate.

We also identified that, contrary to some perceptions in industry, a high level of geometric detail is not required in the graphical model. Simple geometry models, produced relatively quickly and cheaply, can provide most of the essential functionality and data-readiness. This was seen as a favourable starting point to reduce the potential level of investment in the scheme. This project has led to ESS mandating BIM on all of their new capital projects.

**BIM Academy personnel**  
Peter Barker, Graham Kelly, Ashley Murray
Newcastle University
COBie to CAFM

Description

Having recently procured a proprietary CAFM system, Newcastle University wanted to create a solution that would take appropriate asset information from all future capital projects in a consistent, verified COBie format and then load this information into their CAFM system. To do this, the University approached BIM Academy to support them in creating this solution.

A pilot project was identified to test the solution before the process would be utilised on all large capital projects.

To ensure the delivery of good quality information from the capital delivery phase BIM Academy also carried out regular audits of the information as it was developed on the pilot project, providing direction for gradual improvement. This included providing tailored guidance and support to the project team as needed.

BIM Academy created a bespoke tool that provides a translation between the data from construction delivered following the COBie schema to the schema required by their CAFM system. This allows the University at the end of each capital works project to load their CAFM system directly from construction information. An activity that used to take them months to complete, can be done immediately after handover.

What we did

- Audited the output from the design team
- Provided support and training to ensure the COBie data was compliant with the COBie schema.
- Provided guidance and clear practical explanation of how COBie should be used to all members of the project team across the whole lifecycle.
- BIM Academy developed a translation tool that converted information from a COBie schema into the format required for importing into the CAFM system.

Key achievements

The key achievement on this project was that we were able to analyse the import requirements of the University’s CAFM system and create a tool that extracts information from a COBie information exchange and maps the data directly into a format accepted by their CAFM system which can be used on future projects and saves the University a considerable amount of time and money.
Newcastle University
Park View Student Village

Description
This overall scheme required the phased demolition and new build of student accommodation within the existing Richardson Road student accommodation site, providing approximately 1,295 ensuite study bedroom spaces. The existing boiler house, squash courts and HV substation will be demolished. The services infrastructure and energy strategy is being reviewed with the client and rationalised.

The scheme has a distinctive approach to sustainability, requiring an EPC ‘A’ rating. Of equal importance is the requirement to optimise the whole life cost of the scheme.

The proposed area defined for the sports centre and “land for future use” is to be maintained. Services are restricted across these sites and the areas will be finished with simple landscaping.

The target budget for the scheme is £57m net construction cost, however, the University require that design development provides an improvement to this figure and the scheme must deliver value for money.

The client issued a brief for an architectural design competition within which there is a requirement for the development and delivery of a Level 2 Building Information Model throughout the project. It is anticipated that information will be delivered by the design team in IFC format to facilitate the incorporation of the project into asset management strategy for their estate (taken from stage D/E briefing documentation).

BIM Academy were appointed to act on the client behalf as BIM Implementation Manager for the scheme.

What we did
Working with the client representatives and various project stakeholders, BIM Academy advised the client and developed the Employers Information Requirements (EIR) and BIM Use objectives, Supplier Assessment, BIM Execution Plan (BEP), continuous BIM auditing and validation, support and guidance.

Key achievements
BIM Academy advised the client on BIM strategy for the project, facilitated and led a number of engagement meetings with the client and the design team. Analysis of the client’s information requirements led to the creation of a bespoke Employers Information Requirements (EIR) and information required schedule. We also created the BIM Execution Plan (BEP) for the entire project which will form part of the tender documentation for the construction phase. We advised the design team and developed a design team readiness assessment, as well as researching opportunities for innovative BIM uses which will be used particularly during the FM stage.
University of Northumbria
Newcastle upon Tyne, United Kingdom

Description
Supported by BIM Academy, Northumbria University Estates Department is using BIM processes and technologies to support the management of its city campus which comprises 32 disparate non residential buildings totalling over 120,000 sqm.

Starting in 2010, BIM Academy supported the University Estates Department campus in determining its vision for BIM usage to deliver efficiencies in the management of its assets. We developed the detailed requirements for appropriate BIM uses, eg aerial photogrammetry, laser scanning and scan to BIM and 2D to 3D data conversion and then delivered these on behalf of the estates team resulting in a federated model in Revit and IFC format.

The model has also been used as a test bed to explore the analysis of environmental performance and carbon emissions, as well as a valuable communication and marketing aid for the university and its users.

Through detailed discussion with the university operations and estates teams, the key strategic issues were business value and justification, ownership and maintenance, change management, technology platforms, content creation and methods of deployment.

Amongst our findings associated with this work to date are that BIM enabled asset and facilities management can offer major efficiency gains in the retrieval and maintenance of drawings and record information; understanding client specific requirements prior to initiation is important and multi technology platforms are required, based on open standards (IFC). It is also vital that the processes for updating the model are carefully considered at the outset.

What we did
Laser scanning, Revit model creation, object library creation, FM data integration, visualisation, Data property set development for FM use.

Key achievements
The cost efficient creation of a comprehensive intelligent 3D model of the estate which serves as a valuable digital resource to enable workflow efficiencies for the maintenance of asset data. The project is a test bed for further benefits for the measurement of environmental performance and management of critical systems.

“The approach to developing campus building information models should be that “Content is King” How much information is used? Is it in the right format? How much detail needs to be added or omitted? The decision should lie in what the business needs”

Professor Steve Lockley, Northumbria University
Innovate UK Research Project
Smart Connected Buildings

Description
Buildings are becoming increasingly 'connected', there is currently over 20 billion Internet of Things (IoT) devices installed in buildings globally, this number is only going to increase. The magnitude of the data being collected is almost unimaginable. However, ways of exploiting this data for the benefit of the owners, operators, users, and the wider supply chain is in its infancy.

Currently, there is a gap in the market for a platform that collects and analyses the data on buildings from occupant feedback, sensors and design models to construct practical actionable advice that building owners, occupiers and the wider supply chain can use to inform the decisions they make about the design, construction, operation and use of their buildings.

The focus of this feasibility study was to understand how a platform could be delivered for Social Housing Providers to use to improve the performance of their buildings and the well-being of vulnerable tenants. A successful platform could be rolled out to all interested Social Housing Providers.

What we did
As part of an Innovate UK research project, a web application able to link building information contextual data with operational performance data was developed.

The product is a flexible and scalable web hosted dashboard which acts as a centralised HUB where data can be sent, collected and analysed.

The application links data inputs to building elements such as apartments or rooms to give context, additionally, the same inputs are used in conjunction with customisable alerts and advice libraries to inform stakeholders of problems and give practical actionable advice to help minimise complaints and switch to a more proactive building management approach.

The target audience is Social Housing Providers, offering monitoring in both new and existing building stock to address business needs highlighted below:

- Reducing tenant complaints by being able to set alerts such as for high humidity or cold environments.
- Compare ‘as design’ performance against ‘in use’ to highlight performance gaps.
- Compare performance before and after building improvement work takes place, to quantify success and value for money.
- To enable proactive maintenance regimes based on the feedback provided by the platform.

Key achievements
We have delivered an intelligent data platform containing building design information, sensor data and user feedback producing meaningful, actionable advice for occupiers, building owners and those who build and maintain properties was created.
Description
Build Earth Live 2015, Newcastle was an international 48 hour multidisciplinary design and BIM competition, which focused primarily on promoting engagement, interaction and learning for Small and Medium Enterprises (SMEs) with varying levels of BIM maturity.

Teams were encouraged to combine people, process and technology in order to facilitate a cohesive and collaborative working environment and delivery a fully developed design in a digital environment.

The brief required the regeneration of an industrial part of Newcastle Quayside through the provision of a multifunctional, BREEAM Excellent ‘Zero Carbon’ Design Innovation and Showcase Centre. Acting as a hive of activity for 3000 people, the DISC comprised start up innovation hubs, research libraries, retail space, educational facilities, collaborative learning and social spaces, parking provision for 900 cars and improvements to the public realm.

What we did
BIM Academy acted as project manager, principle facilitator and mentor for a team of 44 professionals from 13 companies with varying BIM maturity for the competition bid under the team name NE1forBIM. The team was based in five locations worldwide Newcastle upon Tyne, Manchester, Glasgow, Perth WA and Melbourne. In addition, local professionals and University students were given the unique opportunity to observe and analyse the process through engagement with social media and on site visits.

Key achievements
Winner of the award for ‘Best use of multidisciplinary BIM and Interoperability’

The collaborative, multidisciplinary approach over a short time span, demonstrated BIM Academy’s four core business activities in Strategic Implementation, Asset Management, Project Services and Training. The approach adopted saw 11 different disciplines using and rigorously testing over 40 different technologies to assist in the integration and enhancement of design and project related tasks such as construction sequencing, costing, environmental and carbon performance, asset management, project management and project assurance.
Build Qatar Live
The Museum of Architecture

Build Qatar Live 2012
Doha, Qatar

Description
An international multidisciplinary design and BIM competition held over 48 hours. Competitors were encouraged to exploit interoperable BIM technologies to maximise value and exchange information using a common data environment to coordinate their proposal. Teams from over 40 countries competed live.

The design brief required a building proposal to hold a cultural and social record of architectural designs, featuring modern and historical Islamic architecture, and to transform a way point into a landmark destination by utilising hypothetical reclaimed land off the coast of Katara beach, near the prestigious Pearl Qatar development in Qatar.

What we did
Having initiated the competition bid, BIM Academy collaborated with, Ryder Architecture, Cundall, Colour Urban Design, Mott MacDonald, Turner and Townsend, Northumbria University and the NBS. We delivered a proposal comprised of a wealth of information which was only achievable due to deliberate, carefully structured processes which relied on forward planning and team coordination.

Key achievements
Top award ‘openBIM Build Qatar Live 2012’.

Carbon zero design based on Interoperable Carbon Information Modelling (ICIM) and LEED Gold Status.

Using a collaborative, multidisciplinary workflow over a short time span, our team demonstrated the efficiency achievable when implementing a collaborative BIM workflow. To respond to the severely restricted timescale it was crucial to formulate a carefully structured programme and technology strategy, as part of our BIM Execution Planning. The competition entry also consisted of the following processes:

- BIM execution planning and technology strategy
- Design authoring
- Project coordination using a federated model including architecture, MEP, structure and landscape architecture
- Using IFC to remotely coordinate the design over CDE
- Incremental clash detection and coordination reviews throughout the process
- Automated BIM validation
- 4D planning and sequencing
- Site logistics strategy
- 5D costing strategy and analysis
- 6D facilities management data, including incremental COBie UK data drops
- Technical specification linked directly to BIMs
- LEED accreditation report
- Environmental reporting driven from BIMs
- Open source Carbon analysis using ICIM
- Site planning and construction programme.
- Open source pedestrian modelling, site logistics and traffic analysis
- Environmental analysis at concept stage
- Structural analysis using BIM tools
- 3D visualisation of final proposal
- Business case for project and full submission of a report outlining the processes listed above.
Build Sydney Live
New Convention Centre
Darling Harbour, Sydney, NSW, Australia

Description
Build Sydney Live 2013 won us our fifth international “Build Live” collaborative OpenBIM award. The brief for this 48 hr competition was to design a convention centre comprising a unified building model for the Bayside and Parkside areas of the site, taking into account the existing road infrastructure (A4 Freeway) which could not be altered. The total capacity was to be 12,000 people including separate convention spaces, grand halls, lounges, boardrooms, auditoriums, gallery, conventional spaces, external terrace, promenade, ballroom, and meeting rooms. Green Star Six required.

What we did
Having initiated the competition bid and coordinated the team set up, BIM Academy collaborated with, AECOM, Kykloud, dRofus, Northumbria University, Ryder Architecture and Colour Urban Design. The team was based in six locations worldwide, Newcastle upon Tyne, Oslo, Sydney, Melbourne, Perth and Christchurch. The submission comprised a wealth of information which was only achievable due to carefully structured processes to manage the best available digital tools and this relied on rigorous forward planning and team coordination. Lessons learned from previous competitions included the importance of teamwork, shared understanding of capabilities, clear lines of communication and clarity of responsibilities.

Key achievements
First Prize, OpenBIM Build Sydney Live 2013 Award beating 17 other teams from US, Latvia, Singapore, Japan, UK, Australia and New Zealand. Green Star Six rating. Live global collaboration of 7 companies involving over 60 people over three time zones.

A collaborative, multidisciplinary approach over a short time span, our team demonstrated the efficiency achievable when implementing a collaborative BIM workflow.

Our submission consisted of the following: BIM execution plan and technology strategy, use of 36 applications from 18 design software companies, project coordination using a federated model including architecture, MEP, structure and landscape design. Developing the design through Asite collaboration ensured constructability could be monitored while maintaining the original design intent, Incremental clash detection and coordination reviews, automated BIM validation, 4D construction planning and sequencing. Site logistics strategy, 5D costing strategy and analysis, including WLC and embodied carbon testing. 6D FM data, including incremental COBie data drops. Room data management driven directly from the model. Environmental reporting driven from BIMs. Site planning and construction programme. Environmental and engineering analysis. 3D visualisation of final proposal.