

MANAGE YOUR DATA TO BUILD AND RUN BETTER

A CONCISE AND PRACTICAL DIGITISATION GUIDE
FOR NHS TRUST ESTATE TEAMS



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WHAT YOU'LL LEARN

How to run your estate more efficiently, ensure regulatory compliance, and drive better predictive maintenance, by understanding and sharing data.

This guide provides information on how to improve the sustainability of your estate and the lifetime of your assets.

These goals are achieved by focusing on data—as the principal medium for collaboration between teams and with third-parties—before and during construction projects, through to handover and into ongoing operations.

Data provides visibility of asset status—any asset, anywhere—and the essential information to address that status in a timely manner; the task of ongoing and predictive asset maintenance.

There is a way to exploit data to its maximum value. This guide outlines the practical steps you can take to harness the value.

THE KEY TAKE-OUTS FROM THIS GUIDE:

- A practical dive into the essential steps of digitisation.
 - How to implement them and what the benefits will be.
 - The technology and software driving a robust and uniform approach to data-centricity.
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SECTION ONE

DIGITISING CONSTRUCTION IN HEALTHCARE

CREATE A SOLID CASE FOR FUNDING

Planning	Innovation	Strategy
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- **Demonstrate great planning**

Endless complexity across any NHS Trust estate can trigger mounting costs, duplicated effort, and shortfalls in asset optimisation.

When these problems appear, they multiply and become an ongoing source of inefficient maintenance practices – channelled into catching up, rather than staying ahead. In other words, spending time and money solving problems that could have been anticipated, and facing risks that could have been mitigated in advance.

All are avoidable, depending on the availability and easy accessibility of up-to-date information across the estate.

As trusts bid for HIP (Health Infrastructure Plan) funding, their proposals will be increasingly robust depending on

the degree to which digital technologies are adopted, not least in the alignment with facilitating the ‘Golden Thread’[1]; using digital tools and systems that enable information to be stored and used effectively to ensure safer building.

- **Embrace innovation**

These technologies relate not just to the design and/or construction phases, but also to planned and diligent approaches to the future; the efficient maintenance of buildings and assets to enrich the continued quality of service that NHS Trusts can bring to the healthcare sector, to patients, and to the people that work within them.

Numerous NHS Trust estate teams have engaged with Symetri to help articulate their digital strategies[2]. Our starting point is to work with the teams to define their required outcomes. We do not start with the technology; digital solutions are ‘enablers’, not an end in themselves. They bring maximum value when the context in which they will be deployed has been correctly defined.

- **Create a fault-free strategy**

Outcome-driven strategies require a realistic assessment in four areas, to create the four effective cornerstones of a successful digital strategy:



- ✓ Current status: How your teams and systems work at present.
- ✓ Improvement areas/potential: Where you believe your working practices should be taken in the future.
- ✓ The bridge: What challenges will need to be overcome, to take you from current modes of operation to future modes of operation
- ✓ The process: What changes will need to be made to achieve your identified and ideal future state

CREATING A DIGITAL CONSTRUCTION STRATEGY

In terms of capital projects—new builds and refurbishments—traditional practices prevail within many NHS Trusts. ‘Tradition’ in this respect may be assumed to relate to paper-based information keeping and sharing, dependence on disparate computer-based systems, or the localised storage (by department or even by individual workstation) of key documentation; or a mix of all three. ‘Tradition’ is not necessarily negative. It has worked for many until now, so why change it?

The reason for change is partly pressure and partly because becoming data-centric is about becoming far more efficient; replacing tradition with transformation. The pressure comes from the government’s Building Information Modelling (BIM) mandate, the Health Infrastructure Plan (HIP), and the New Hospital Build

programme. It is compounded by the very existence of facilitatory technologies that make it easier to work smarter; more connected, collaborative and compliant to standards and regulations.

In NHS England’s ‘Business Case Core Checklist’, the guidance for Build Schemes states:

“Evidence to be provided of commitment to government construction strategy including:

- Cost reduction c15%
- Procurement reform
- Building information modelling (BIM)
- Government ‘soft landings’
- Benchmarking”[3].

Technology creates robust audit trails. But it is not just about looking back and keeping records; it’s also about looking forward, particularly when it comes to Facilities and Estates Management. This focus frames your strategy.



BUILD YOUR STRATEGY



*Patient group(s) must be part of this process: “For build projects, the case should show that patient group(s) are actively involved in informing development of the plans”[4].

SECTION TWO

THE LIFECYCLE OF THE BUILT ASSET: THE ADVANTAGES OF USING DATA ACROSS AN NHS ESTATE

GAIN VALUE FROM BUILDING INFORMATION MODELLING

The journey begins by becoming familiar with the practices and procedures outlined within a series of standards known as ISO 19650. These standards are the framework for practical adoption of BIM.

In September 2021, the Infrastructure and Projects Authority published a policy paper entitled ‘Transforming Infrastructure Performance: Roadmap to 2030’, attaching the following importance to BIM practices:

“In the UK we have already advanced the use of Building Information Modelling in the creation and care of our built environment, incorporating more categories of data and integration across the different elements. However, we need to push this faster and further to apply available technology to government sponsored projects and encourage new developments”[5].

In the UK, BIM Level 2 has been mandatory for public sector projects since April 2016. More than simply being a mandated requirement, it is increasingly being adopted within construction as a whole for the practical and enduring benefits that accrue to all stakeholders within a project; from the funders, all the way through to those who will be responsible for the built asset upon handover.

This is where the estates management team comes in. BIM is where you will feel the benefit in everyday operations and in forward strategic planning. It will drive best practice in how you use data.

OTHER CORE CONSIDERATIONS

Where mandatory compliance exists—drive a best practice requirement for data management:

1. The Building Safety Act, Fire Safety Act and the BS8644-1 Digital Management of Fire Safety Information[6].

As a result of the tragedy of Grenfell Tower, the Grenfell Tower Inquiry was set up. Phase 1 was issued in October 2019 concluding in Chapter 26, “there was compelling evidence that the external walls of the building failed to comply with Requirement B4 (1) of Schedule 1 to the Building Regulations 2010”.



Phase 1 of the Grenfell Tower Inquiry concluded that the building's exterior did not comply with regulations and was the central reason why the fire spread.

Phase 2 of the inquiry is still ongoing. In parallel with the Inquiry in September 2017, as part of the Government's response, the government commissioned Dame Judith Hackitt to review the Building Regulations and Fire Safety Act and in particular, their impact on Fire Safety. Now known as the Hackitt report, the recommendations were wide and far reaching. In December 2018, the Government undertook to implement the report in full. From these recommendations, a new fire safety act was introduced in April 2021 and the government published the Golden Thread Report in July 2021.

These form a subset of the UK government's Building Safety Bill which In April 2022, received Royal Assent making it the Building Safety Act and a new British Standard code of conduct 'BS8644-1 Digital management of fire safety information', which was published on 29th July 2022.

As a result of this recent legislation, if your hospital will soon be working on any projects which are over 7 stories or 18m high, you'll need to be prepared on what needs to be done to remain compliant with the acts and standards to reduce your risk of being fined. [7]

2. Compliance.

Compliance can be complex when taking all the necessary regulations into account and ensuring their observance across NHS estates with their diversity of buildings and assets.

'Pre-digital', the necessary trail of documentation and proof could result in tens of thousands of documents for a single project. A digital approach enables the data to be stored reliably, easily and with automated audit trails. It enables it to be easily shared with identified stakeholders, architecture and construction contractors, users, and other supply chain partners. It enables you to understand what's going on, where. These are a significant consideration when it comes to making your technology choices [See Section Three].

WHAT IS BIM?

From planning to operations.

“Building Information Modelling...is the holistic process of creating and managing information for a built asset. Based on an intelligent model and enabled by a cloud platform, BIM integrates structured, multi-disciplinary data to produce a digital representation of an asset across its lifecycle, from planning and design to construction and operations”[8].

Digitisation in construction increasingly pivots around the practices of BIM, which has grown in importance, adoption, and value ever since the initial 2016 mandate. It is a key driver of the [ISO 19650](#) series of standards described as:

“Organisation and digitisation of information about buildings and civil engineering works, including building information modelling (BIM) – Information management using building information modelling”.

It should not be assumed that BIM has served its purpose when a construction project goes live. Data created and collected in the build phase becomes an information power-house for the life of the built asset and the multitude of assets that reside in and around it.





Correctly managed, data harnessed through BIM-based projects provides an invaluable tool for estates management, delivering the information you require when you require it down to a finite level of detail—see panel below.

Harnessing data and technology at Milton Keynes University Hospital

“For the Cancer Centre, many of the external project collaborators held the data that we needed in their project Common Data Environment (CDE).

Unfortunately, some of the data didn’t exist at all. We had a particular example where we needed to replace a glass window in the Cancer Centre and although we had the specifications of the window, we didn’t have the information we needed about the tint of glass used”.

[Claire Orchard, Head of Digital Innovation at MKUH].[9]

The theory behind BIM is based on the compelling logic of collaboration across and between each stage of construction. Data becomes the core of collaborative processes which start at the earliest phase of concept and design, continue through construction, and then endure through the lifecycle of the built asset.

If all pertinent data is not brought together, it can become time-consuming to locate the right information at the right time. It may sometimes never be possible to find it at all. This is not only inefficient, but could also trigger compliance oversights.

Through collaborative processes, BIM—and particularly the bringing together of all data—provides a basis for eliminating misunderstanding, misinterpretation, and errors. As such negative factors are minimised, costs can be more easily controlled and contained, and projects can progress faster.

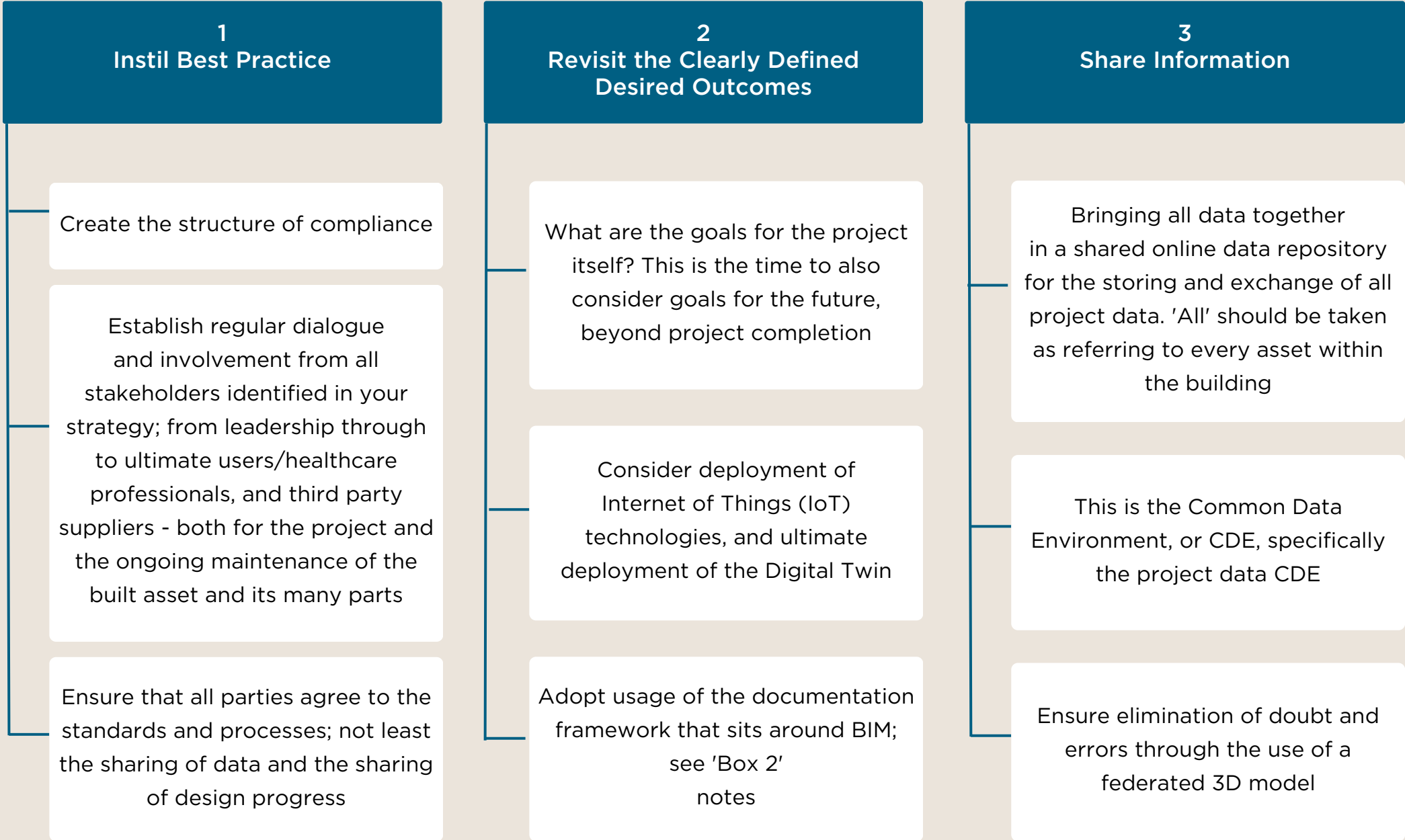
That’s the theory; simplification, clarification, and communication. Yet to arrive at this state of enhanced efficiency can be a complex process in itself.

THE RIGHT AND WRONG WAY TO IMPLEMENT BIM

There are so many aspects to a comprehensively deployed BIM strategy and approach that many organisations settle for a ‘pick’n’mix’ option; finding benefits within certain aspects of BIM sufficient. These may include 3D modelling, or shared data, or adherence to prevalent standards, or simply the use of the logical and sequential documentation for which BIM provides a framework. On a standalone basis none of these constituent parts can be defined as BIM. They are elements of it.

Connect the elements and you connect the entirety of any project, the enormity of the tasks involved with sustaining its value, and your ability to anticipate and resolve issues now, and long into the future...

CHART YOUR JOURNEY



NOTES:

Box 1

Best Practice is facilitated by everyone buying into the collaborative framework (the project plan) established at the outset—strategy creation— to drive project success. This framework is commonly based on a series of documents pertaining to expected and required modes of participation.

Box 2

Overall documents should include a BIM Execution Plan (BEP), Employer’s Information Requirements (EIR), Master Information Delivery Plan (MIDP), and a Task Information Delivery Plan (TIDP). Further detail is assigned to a fuller series of documents:

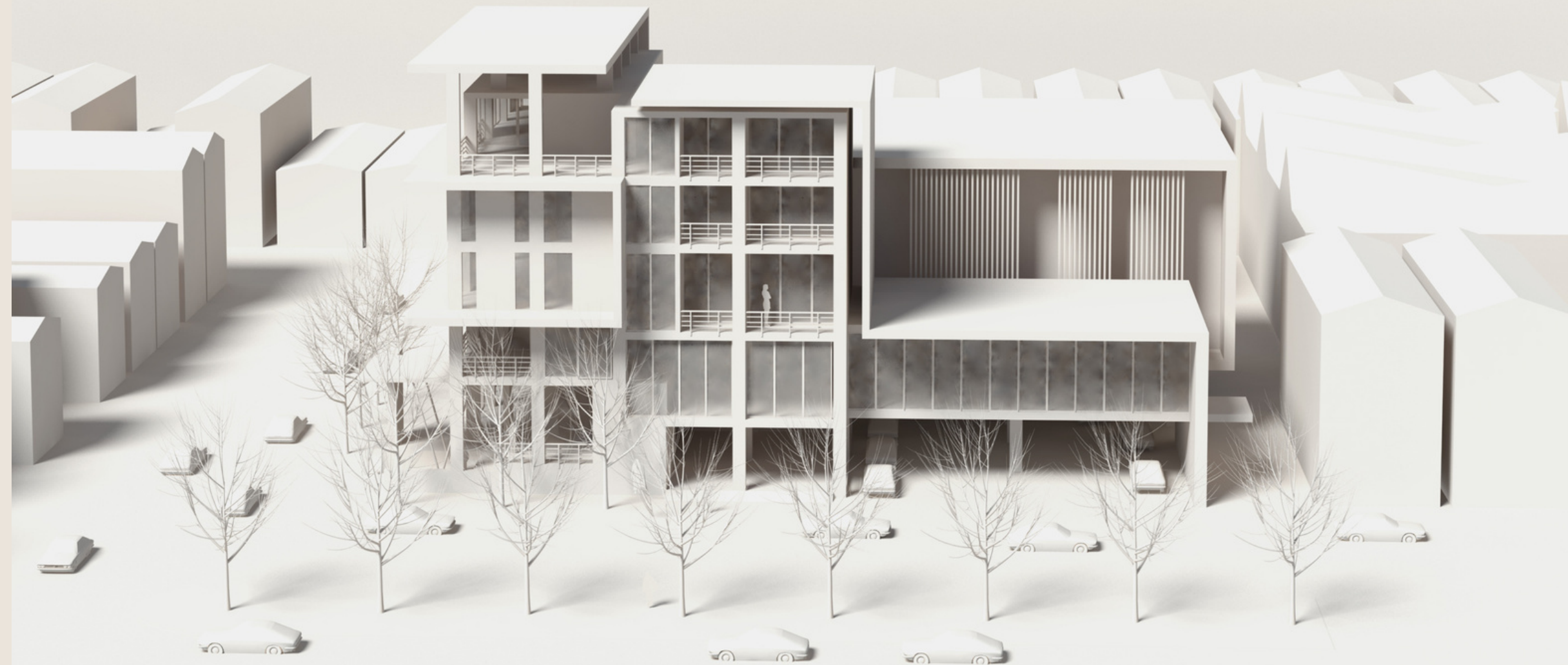
- Organisational, Project, Asset, Exchange Information Requirements
- Pre and Post Appointment BIM Execution Plans
- Mobilisation Plan
- Information Delivery Risk Register
- Capability Assessments
- Master & Task Information Delivery Plans
- Information Protocol (Contract)
- Model Production Delivery Plan

Symetri can you help you make sense of these requirements with our BIM Project Support Services.

Box 3

A significant pillar of sharing information is provided by the use of 3D modelling. Whilst this approach makes it easy to visualise how the construction will look—keeping stakeholders informed and involved as construction progresses—it also brings enormous practical benefits. These come primarily by aggregating input through the use of federated models, for sharing and collaborative input from everyone involved in bringing the project from concept to completion. NBS (National Building Specification) defines the federated model as “a combined Building Information Model that has been compiled by amalgamating several different models into one (or importing one model into another)”.

From architects and engineers through to building services specialists the model affords each discipline updated views of the latest model in its most recent iteration. Thus, as an example, it assists hugely in the process of clash detection. It enables the entire team to spot problems before they ever appear on the construction site. It is a cornerstone of true collaboration throughout the construction value chain.



SECTION THREE

MAKING THE RIGHT TECHNOLOGY CHOICES

SUCCESSFUL PROJECT IMPLEMENTATION DEPENDS ON THE TOOLS YOU USE

The value of data increases significantly if the right tools are used to manage, gather, store, and share it. Without strong data governance—including the avoidance of all doubt about the reliability of the data—the essential foundation of future efficiencies is not as strong as it could be. Yet still, in many organisations within the NHS, data is kept in siloes and rather than there being one single version of the truth (constantly and automatically updated).

This single version of the truth is referred to as the common data environment (CDE), a prerequisite of any BIM strategy and something you will encounter wherever your own investigations into digital capabilities might take you.

What is A Common Data Environment?

A digital hub where information comes together as part of a typical BIM workflow. It also goes beyond BIM data and information, and can include anything from project contracts, schedule, change orders, and more.

If data is to assume greater value across your estate's activities, it must be easily accessible by your teams, and accessible where and when they need it. These are facets of flexibility afforded by cloud computing.

Cloud enables the seamless joining up of people. It does the same for systems and workflows, buildings and locations, equipment and IoT sensors. From an estates management perspective, it is like CAFM, with 'cloud' taking the place of 'computer' in the Computer Aided Facilities Management acronym. As it does so, it delivers the data collection and management advantage — the common data environment.

Symetri continually evaluate the technologies that can support the 'Golden Thread' of information throughout an asset's lifecycle—as introduced in Section One—providing a lifetime record of the building's construction.

To avoid 'application sprawl' (a solution to resolve one issue, a different solution for another issue, and so on)

it is not just teams and stakeholders that should be unified, but also the core platform that brings all software and workflows into one place: A unified platform:

AUTODESK CONSTRUCTION CLOUD (ACC) A SUITE OF SOLUTIONS UNDER ONE UMBRELLA

“Disconnected data creates confusion. Connected data empowers confident decisions. Bring all project data together in one place for predictive insights that help you reduce risk...”

(See [Symetri's introduction](#) to the Autodesk Construction Cloud).

The Autodesk Construction Cloud (ACC) is a unified platform that brings together a suite of construction management software products, supporting workflows spanning all phases of construction—from design, to planning, to building, to operations.

ACC delivers “Better clash avoidance and collaboration in a common data environment” [10].



Three applications merit highlighting when you are considering your technology choices:

Autodesk Build	Oculo	Bimfire Tools
<p>This is part of the Autodesk Construction Cloud (ACC) Unified Platform. It introduces the Assets Module, where you can assign an asset tag to any asset: each wall penetration, cladding panel, fire door etc., in order to capture the required digital information about the asset.</p> <p>You can then link data, photos, checklists, certificates and identify the location of these on floor plans where non-compliance issues could be raised, monitored, and closed out. This will all be stored and linked in the ACC with managed access for the lifecycle of the building.</p>	<p>Oculo is a digital construction solution which combines hard-hat cameras, BIM models/floorplans and artificial intelligence (AI) to remotely view, share and track on-site progress. Oculo brings another dimension to the technical offering of capturing evidence through the ease of 360° photographic capture.</p> <p>You can reconstruct your site in 3D and automatically map photo capture to floorplans. This will improve operational efficiency, safety, and maintenance practices within the NHS Estates.</p>	<p>Bimfire Tools is a Revit plugin for fire safety design, integrating fire safety information directly into the BIM process for a digital workflow.</p> <p>Bimfire Tools reduces repetitive tasks and frees up time for the fire safety designer to become a more involved part of the design process. The fire safety information is fully accessible in the facility management.</p>
<p>Discover more...</p>	<p>See how Oculo works: Watch the video</p>	<p>Watch the webinar overview</p>



Three technology frameworks to start thinking about now for the future:

Augmented Reality	Internet of Things (IoT)	Digital Twin
<p>Unity's VisualLive enables you to import data from any BIM software to create Virtual Reality walkthroughs or customisable Augmented Reality views.</p> <p>People can gain an almost real view of projects in progress or how they might finally look and what their function will be upon project completion.</p> <p>VisualLive can greatly assist NHS Estates by enhancing productivity, accuracy, and decision-making in managing healthcare facilities.</p>	<p>Products and machines have become more intelligent and can be controlled remotely by humans or other machines. Products are connected to the Internet via sensors to collect and transmit data that is used for measurements, diagnosis and automatic control.</p> <p>Associated IoT technologies enable you to track asset performance in real time. This enables you not only to gain full visibility of asset status, but also of buildings' performance such as energy control (reducing heating in unoccupied spaces) and carbon emissions management.</p>	<p>Having mastered BIM data places you in a perfect position to consider the use of the Digital Twin to help better manage your estate.</p> <p>A digital twin is a digital replica of a physical asset. It puts insight and control on your screen rather than you having to walk round the estate to assess status. It depends on the diligence of your approach to data; from which, having read this guide, you will now be able to gain even greater value.</p>
<p>See how VisualLive works: Watch the video</p>		<p>Discover more...</p>

HOW SYMETRI CAN HELP YOU

BECOME DATA-CENTRIC

For NHS Trusts, an unequivocal focus on data is increasingly critical. Great innovations are everywhere in evidence in healthcare, but in the buildings that surround and facilitate it, considerable scope for improvement remains. Symetri are helping NHS Trusts to rise to this challenge and work smarter.

For our work with Milton Keynes University Hospital (MKUH) NHS Foundation Trust, Symetri were awarded Channel Partner of 2022 (partnership with Autodesk) and BIM Project of 2022 based on how MKUH harnessed data and technology to improve patient experience. The awards are run by Construction Computing Magazine, to recognise the excellent work carried out by companies within the construction sector and the sophisticated tools they use to develop, maintain, design and modify buildings across the UK [10].

Building Information Modelling, from an estates management perspective, will help you track and

manage your assets better, ensure timely maintenance, and extend their lifetime value. It will form the basis of practices that will help you reduce running costs. It will make a notable contribution to the way in which you can improve the patient, and the clinician experience, whilst complying to regulations and to government guidelines. Symetri can guide you on the way to attaining this ideal future state.

At Symetri we support innovative companies in the building, infrastructure, and manufacturing industries to optimise their working methods and increase the quality of their projects. Our purpose is to challenge people to work smarter and to turn ideas into new realities that shape a better future.

We partner with best of breed technology partners to bring you the right IT solutions to meet your business needs, supported by a comprehensive range of services to give you peace of mind that your core IT infrastructure and critical business applications will be available when you need them.





DOCUMENT REFERENCES

[1] For a quick reference to how the Golden Thread is defined by the UK Government, see [Chartered Institute of Architectural Technologists](#).

[2] In May 2022, Symetri hosted an event at the British Medical Association (BMA) outlining the many considerations of 'Digitising Construction in Healthcare'. [View the on-demand presentations](#).

[3] Page 39, Ref 3.8.6: [Capital regime, investment and property business case approval guidance for NHS trusts and foundation trusts](#) / Annex 1: Business case core checklist.

[4] Ibid: Page 5, Ref 31.2.5

[5] [Transforming Infrastructure Performance: Roadmap to 2030](#)

[6] For more on BS8644-1 compliance requirements, [watch this video](#)

[7] For more details on how to stay compliant with fire safety measures, read Symetri's guide to ["The Digital Requirements of Fire Safety Compliance"](#)

[8] What is BIM? [Autodesk](#)

[9] Read the [case study](#) on how MKUH implemented a robust BIM strategy

[10] See [Autodesk](#)

[LEARN MORE HERE](#)



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