BIM in Local Authorities

A paper discussing the issues surrounding the implementation and adoption of digital ways of working/BIM in local authority organisations

November 2020

Introduction

Since 2011 there has been a focus on key estate-holding central government departments and ministries to embedding building information modelling (BIM) into their project procurement and delivery processes, with this becoming mandated from April 2016 onwards for all central government departments.

LAs are not included in the mandate; however, given their significant estate-holding and management, they are potentially well positioned to benefit from its implementation. Given the economic environment at the inception of the BIM programme, there was a focus on using BIM as a way of driving cost down in the capital delivery phase of a project. It has always been a fact, however, that BIM has a key role to play in the operational phase of an asset's life cycle. The base premise of BIM is therefore often misunderstood, which has, to some extent, held it back from being more routinely specified and used by clients and asset operators.

There is a widespread belief that BIM is 3D modelling and that entry cost is high. In fact, BIM is about data modelling and collaborative, standardised information management. Furthermore, return on investment can be short if deployed proportionately and therefore can be considered an invest-to-save opportunity. For procuring and operational clients the specification and construct of the data to be collected and shared is where the benefits can be secured.

This paper seeks to surface the perceptions of LAs and suggest initiatives/actions to help resolve issues and achieve wider take-up across the LAs.

Drivers:

There are two distinct stakeholder groups for this paper: policy makers/sponsoring body for this paper, the CDBB as part of the Construction Innovation Hub (CIH); and LAs.

- A key driver for the CDBB, in partnership with the UK BIM Alliance, is to influence the wider adoption of BIM/digital ways of working. The wider adoption and increasing client/supply chain capability and proficiency will support other key initiatives, such as the national digital twin (NDT) and modern methods of construction (MMC).

- A key driver for LA organisations will be potential cost and time effencies, improved service delivery and portfolio and life-cycle planning and meeting net-zero carbon target delivery.

The two stakeholder groups may have different drivers, but they are interdependent in supporting the delivery of each other's needs.

Issues identified:

- Low take-up of BIM (digital ways of working) across the sector.

- The sector's estate capital and operational expenditure is significant. Continued pressure on LA budgets has the potential to drive operational decision-making away from estates to focus more on service delivery.

- There is a low sector understanding of BIM and how it could support better budget efficiency and service delivery.

- There is a perception that BIM is just for new builds and entry cost is high to deploy.

- There is a concern that the impact of change on existing culture and process might be too burdensome.

The uptake of BIM and digital ways of working is low in local authorities. A recent survey undertaken by the local authority procurement group NACF (National Association Contractor Frameworks), stated that around 75% of those polled were neutral or negative to the introduction of BIM. The report also highlighted stated obstacles, which included:

- Organisational culture and senior executive sponsorship.

- Client engagement with supply chains, with procurement practices not creating an environment to deliver or benefit from the introduction of BIM/digital deliverables.

- BIM is perceived as only being suitable for large-capital new-build projects.

The size of the LA sector

There is a total of 343 councils in England, 123 of which are unitary authorities/London Boroughs. Local authorities in England spent c£25bn on capital expenditure in 2017/2018. This represents a 25% increase over a five-year period.

New construction, conversion and renovation represent c55% of this spend (£13.8bn) and land acquisition and existing buildings represent a further 16% (£4bn1).

Key case for adoption – Potential return on investment

The business case for adoption is strong. Approaching the planning and operation of an authority's estate through a data-led approach could have a significantly positive impact, and every 1% efficiency on capital delivery could save c£250m. The ratio of capital expenditure to operational life-cycle (energy, PPM etc.) cost is of the order 1:4, which could amass lifetime savings of c£1bn or c£16m p/a/1% efficiency over a 60-year period.

Special interest group view point/experience

Key areas of concern:

1. There was a unanimous feeling that BIM for many clients is not understood, and its positioning by their estate supply chains does not help.

2. There is a perception by LAs that the cost of BIM deployment is high. Cost for dedicated software, purchase of data environments and having to change current practice and procedures all add up to a significant entry cost.

3. The benefits case for BIM has not been made, and therefore LAs find it difficult to justify effort towards its introduction.

4. LAs are facing increasing pressure on budgets and service delivery, and any investment needs to have a clear and expected time frame for payback. Currently this has not been articulated.

5. There is a perception that BIM is for capital projects (capital includes new build and major refurbishment). There is a low appreciation of how it can be practically applied/introduced outside a capital project delivery to impact the whole lifecycle.

6. What does 'being BIM compliant' mean? Can an organisation be BIM compliant without purchasing bespoke software? Can its existing systems be configured?

7. BIM/Digital delivery must tie into the key targets being set, net-zero carbon, pending legislation for high risk high rise buildings and overall planning and delivery efficiency.

8. LAs are generally not proficient in standardised and structured data capture/specification. Could their entry be simplified through standard data request templates?

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1   Reference data MHCLG LA Capital Exp Receipts England 2017-18 Final Outturn paper.

Response to highlighted concerns above:

1. There was a unanimous feeling that BIM for many clients is not understood, and its positioning by their estate supply chains does not help.

The LA sector is diverse. Authorities have varied responsibilities, budgets and populations to manage and support. BIM, therefore, needs to be articulated in a way that is not a 'one-size-fits-all'.

Requirements –

The key message that 'BIM is about data and not 3D modelling' needs to be clearly made. Rendered imagery, virtual reality, augmented reality, and so on, need to be positioned, but shown as not being a core deliverable of BIM.

Suggested next phase deliverable –

Production of short information videos (Senior management engagement video + How to get started).

Short reference guide to 'What BIM is and What BIM is not'.

2. There is a perception by LAs that the cost of BIM deployment is high. The cost of dedicated software, purchase of data environments and having to change current practice and procedures all add to a significant entry cost.

The cost of BIM implementation needs to be proportionate. The cost of bespoke common data environment solutions, authoring software licences, and so on, is a significant consideration. The real value of BIM is the specification and collection of data. Therefore, a 'light-touch' proof-of-concept, first-stage engagement may be possible. This could be through configuration of an organisation's existing software such as SharePoint or Teams or configuration of existing document management systems or other corporate file-storage facilities. Although these approaches will not provide the functionality and workflows of a full common data environment (CDE) they may provide a low-cost entry point into information storage and management. The key focus should be on the naming conventions and data structure that is used to deliver the data/information. It should reflect emerging standard practice (ISO 19650 national annex, Uniclass, NRM, COBie, etc.), which would allow it to be shared/accessed more easily and have the flexibility to be more easily loaded onto new systems as and when an organisation's BIM journey matures.

Requirements –

A graduated, easy-entry BIM adoption message needs to be shared. Any messaging needs to convey that the data and information storage and access is one part of an initial set-up. There is still a need to develop and define an organisational 'discovery phase'. The discovery phase would kick-start an organisation's discussion about BIM and the impacts it could have on business and service outcomes. It is therefore important to be able to reference peer benefit case studies and return on investment (ROI) statements to support early engagement at a board level.

Suggested next phase deliverables –

The production of an 'easy-read' roadmap with more detailed reference sections supporting 'journey points' (start of the journey, BIM in organisational planning, BIM in capital project delivery, etc.).

The production of a discovery phase checklist.

3. The benefits case for BIM has not been made and therefore LA's find it difficult to justify effort towards its introduction.

It is difficult for an organisation to commit to change if it is not convinced it can deliver benefits that support its required outcomes. There is therefore a need for a library of case studies to be developed to enable a body of reference material to be formed, to support the business case for organisational adoption.

Requirements –

There is a need for the production and sharing of case studies. The studies need to cover the full BIM implementation life cycle. How BIM was implemented, the levels of investment and the ROI timelines, and so on. They should also include the wider benefits experienced through collaborative data sharing and access to 'point-of-truth' data sets and documents. 'Point of truth' is where data and documents have been reviewed (likely to be done as part of the BIM discovery Phase) and old and out-of-date information archived or discarded, leaving the reference point data available.

Suggested next phase deliverables –

Alignment with the SFT BIM portal should be reviewed.

UKBIMA have put a survey out to collect case study data for review and follow-up. Liaise with UKBA to share outcomes.

4. LAs are facing increasing pressure on budgets and service delivery, and any investment needs to have a clear and expected time frame for payback.

The point was made by an SIG member that it is acknowledged that sometimes a £1 investment can provide a £5 saving. However, the question was raised about who provides the £1. LAs are facing increasing pressure on budgets and service delivery, and any investment needs to have a clear and expected time frame for payback. Currently, this has not been articulated. Therefore, there is a clear need for peer case studies (mentioned above and referenced in case study section below). There is also a wider cultural point in that a saving procured in one department or business area may benefit another department. The current approach to budgeting does not support this type of collaborative working. Case studies/summary case study round-ups need to clearly articulate that the implementation of BIM goes further than just project delivery and operation of the asset – it can have positive impacts on service delivery.

Requirements –

Support documentation is required to enable cultural change and increased collaboration.

Suggested next phase deliverables –

Peer case studies (picked up in 3 above).

'Ripple' benefits need to be articulated (picked up as part of the road map).

Drive the understanding that BIM is about the data (picked up as part of introduction video and reference guide).

5. There is a perception that BIM is for capital projects. There is a low appreciation of how it can be practically applied/introduced outside a capital project delivery.

BIM is a process and not a technology or software. The BIM process is well articulated in key standards (ISO 19650 part 1 and 2, PAS 1192 parts 3,4 and 5). There are key templates that support the process, which, when considered and completed, will support the specification of data deliverables that help an organisation's business plan and outcomes to be delivered. The illustration in Appendix 1 indicates the BIM process and identifies the part that each specified template plays (the organisation information requirements (OIR), asset information requirements (AIR) and the exchange information requirements (EIR)). Appendix 2 provides a high-level BIM organisation roadmap which, overlays the potential benefit areas and where the BIM process supports the organisation's business activities.

Requirements –

There is a requirement to develop a toolkit that articulates how BIM/digital deployment can be proportionately introduced, and which provides easy-to-use templates.

Suggested next phase deliverables –

Develop Appendix 1 and 2 into an LA BIM support resource.

Develop an LA 'discovery phase' check list setting out for each existing system: whether it is current; what it does; whether it is still used; the state of the data in the system – checked/un-checked, current/out-of-date; and the system's limitations – data holding time lines, restricted capacity, and so on.

'Vanilla BIM' 'develop ready-to-use and populated' data/information delivery templates to support client data requests.

6. What does 'being BIM compliant' mean? Can an organisation be a BIM adopter without being BIM compliant, that is, without purchasing bespoke software? Can their existing systems be configured?

There is confusion within the sector, fuelled by poor messaging around 'What does being BIM compliant?' mean and poor benefit articulation. Both are colouring the decision-making process for organisations, and a simpler, more compelling case needs to be made.

Requirements –

A clear articulation of the options an organisation has when planning its BIM journey.

Suggested next phase deliverables –

A roadmap outlining the engagement process, benefits and actions, clearly showing the different points and levels of engagement they could adopt to suit their needs and capabilities (picked up in 2 above).

7. BIM/digital delivery must tie into the key targets being set, net-zero carbon, pending legislation for high-risk high-rise buildings and overall planning and delivery efficiency.

Local authorities are bound by existing and developing/future legislation. Establishing a reliable and accessible data set will significantly speed up an organisation's planning, risk assessments, action planning and reporting, and compliance assurance.

Requirements –

Organisations need an understanding of the value of asset data. They need support in growing their understanding and awareness of what BIM is, what digital ways of working are and the choices they have in implementing its deployment within their organisations.

Suggested next phase deliverables –

A clear road map/guide articulating an organisation's deployment option (output 2 above includes this).

Production of a short information video and short reference guide to 'What BIM is and What BIM is not' (output 1 above includes this).

8. LAs are generally not proficient in standardised and structured data capture/specification. Could their entry be simplified through standard data request templates?

Organisations and the people that work in them are busy. They have set goals and tasks that keep them fully occupied. There is an adage that 'people are too busy chopping down trees to have time to sharpen their axe'. Even if there is a new way of working that can make them and the organisation more efficient, it often goes unheeded, as every one is too busy. The BIM adoption journey can therefore be a slow one. However, even if the case for BIM efficiency savings has been accepted and engagement of the board/executives has been achieved, there is still a need to make the path to adoption easy. The drafting of 'standard' BIM templates (either a check list/framework or completed data request) should be considered, as most built assets have the same types of system (water, heating, electrical, fabric, etc.). Furthermore, operational maintenance software such as CAFMs require similar data for maintainable assets. A standard AIR/EIR could therefore be drafted as a document that a client could issue as part of their tender and, with basic data repositories in place, could request and receive data to derive benefits.

Requirements –

To make BIM adoption as easy as possible, the creation of a 'vanilla BIM' set of data requirement templates could support the adoption and accelerated take-up of BIM.

Suggested next phase deliverables –

Consider the production of a set of guide/standard templates (OIR, AIR, EIR) that could be incorporated into an organisation's BIM standards/tenders.

Liaise with PSITG and the CCS BIM SIG, who are also considering the drafting of 'vanilla BIM' templates. Consider co-joining to produce requirements.

Conclusions

There are no legislative/local government procedural notes that put obstacles in the way of BIM/digital deployment within LAs.

The barriers appear to be an organisation's low appreciation of the benefits of a digital environment, the cost and options for deployment and access to peer case and benefit studies to help them make a case internally.

The level of LA spend in both capital development and operational (revenue) expenditure can result in significant budgetary efficiencies. Furthermore, LA budgets are under increasing pressure and there is a rising expectation of increased and improved service delivery. There are, and will continue to be, policy drivers around the environment, health and safety, operational efficiency, and so on, that further pressurise an LA organisation to demonstrably report improvements and compliance. Implementing digital ways of working and data management processes is key to helping deliver against all these pressures.

In answer to the above there is a need for a simple approach to BIM/digital to be made. The highlighted deliverables, if funded, would provide a core set of engagement guidance, tools and templates that could support a wider take-up. As stated above, a 1% efficiency in operations is a c£16m p/a saving. In addition, there can be benefits such as improvements in health and safety compliance and decreased carbon, in part brought about by improved estate planning and service operations facilitated by data-led reporting and decision-making.

A wider take-up and implementation of BIM within LA supply chains will further act as the catalyst for increasing the deployment of BIM across all client groups. This, in turn, supports delivery of key initiatives such as the national digital twin, efficiency strategies (TIP/TIES etc.).

Actions/Requested future funding for deliverables:

- Production of a short BIM information video.

- Short reference guide to 'What BIM is and What BIM is not'.

- The production of an 'easy-read' roadmap with more detailed reference sections supporting 'journey points' (start of the journey, BIM in organisational planning, BIM in capital project delivery, etc.). And the production of a discovery phase checklist.

- Drafting and sharing of case studies to support ROI.

  - Alignment with the SFT BIM portal should be reviewed.

  - UKBIMA have put a survey out to collect case study data for review and follow-up. Liaise with UKBA to share outcomes.

- Consider the production of a set of guide/standard templates (OIR, AIR, EIR) that could be incorporated into an organisation's BIM standards/tenders.

  - Liaise with PSITG and the CCS BIM SIG, who are also considering the drafting of 'vanilla BIM' templates. Consider co-joining to produce requirements.

- Develop a communications plan to raise awareness and engagement with the LA sector (combined plan between CDBB, UK BIM Alliance, NACF).

Appendix 1
BIM process/templates
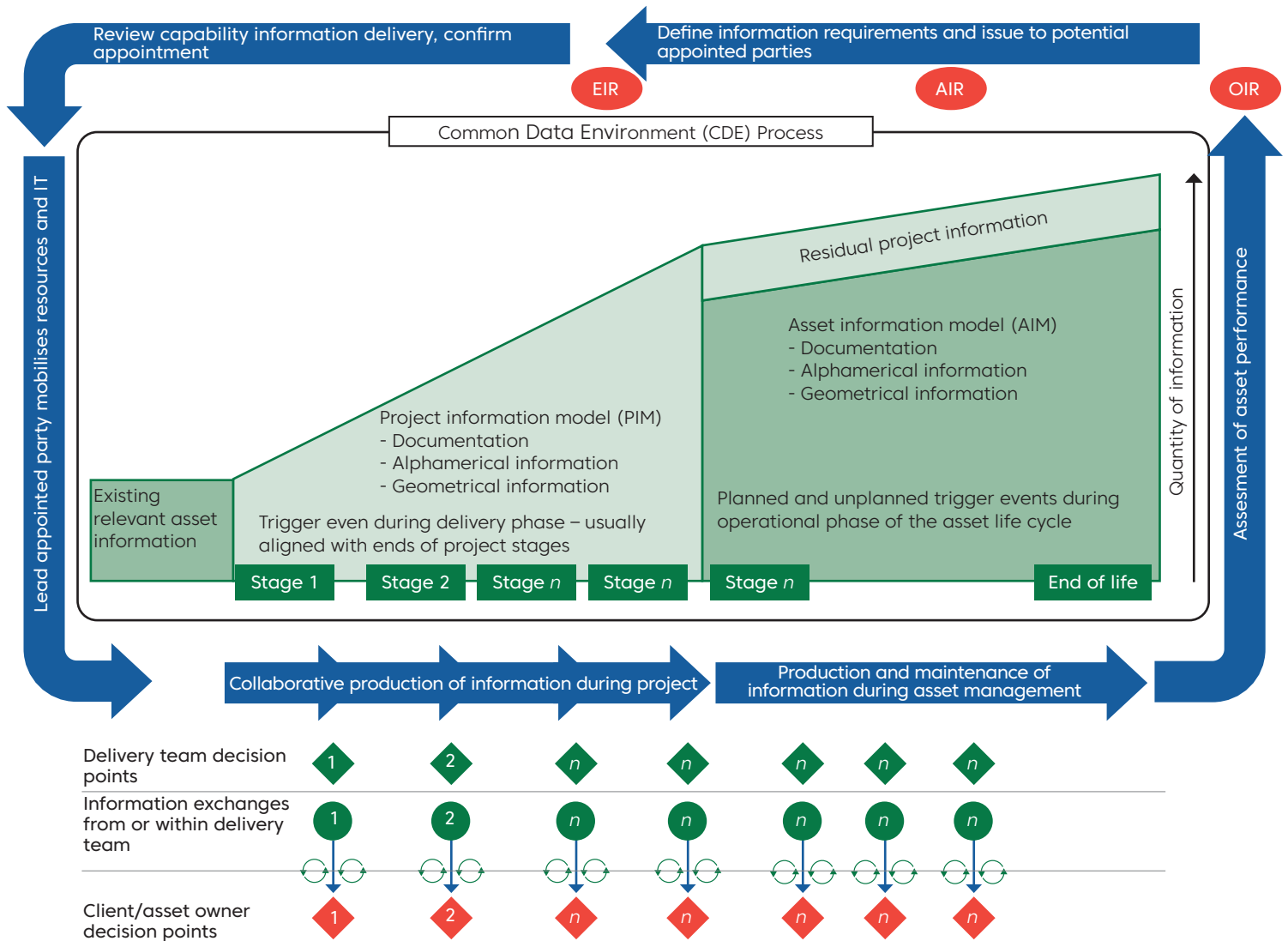
Appendix 2
Local Authority BIM/Digital Roadmap

The next phase of work, if agreed, would create an interactive digital roadmap as an information resource for clients and adopters. The interactive model (Fig 2) would link to a data matrix (Fig 1) that linked to the stages of the roadmap and provided a statement for deliverable benefits, what to do to implement a digital approach for that stage and how a low-cost proof of concept could be deployed within the organisation.

Fig. 1

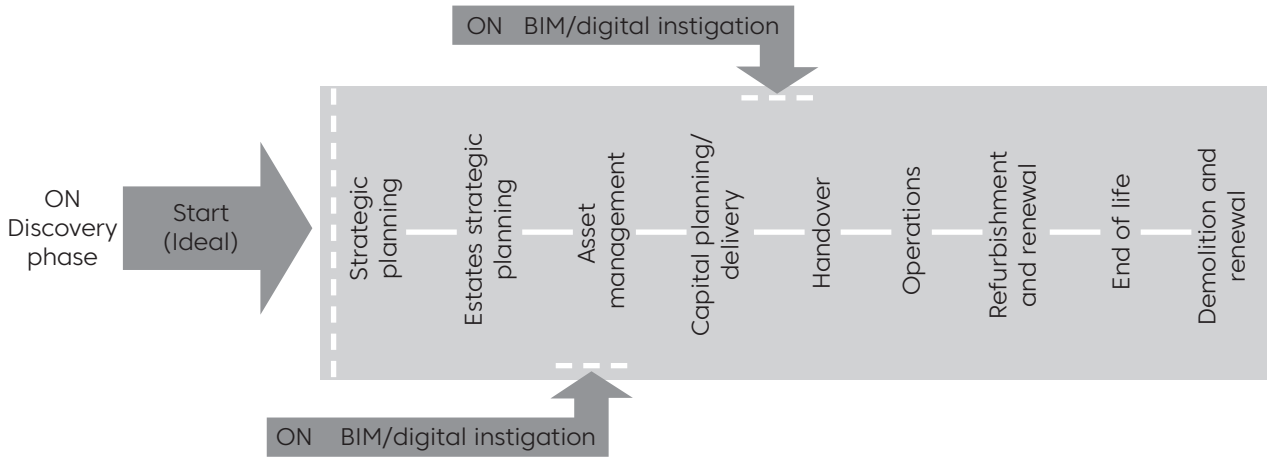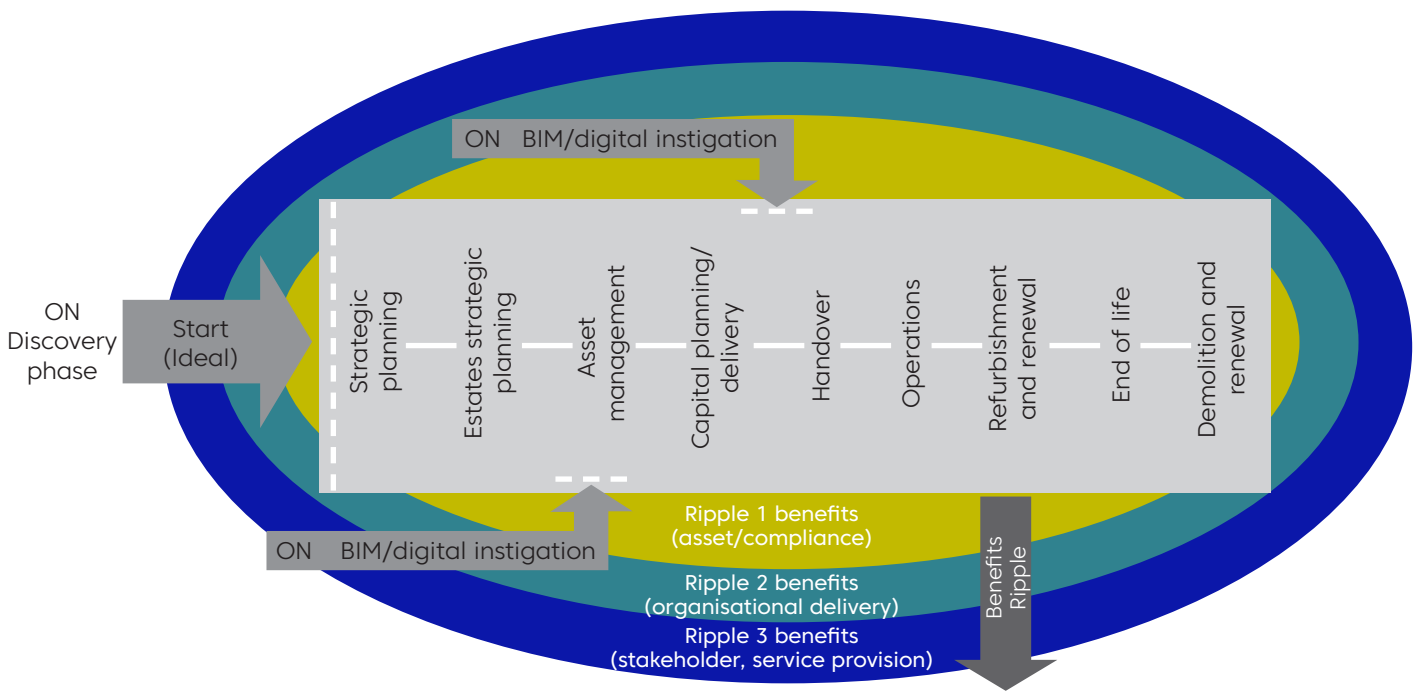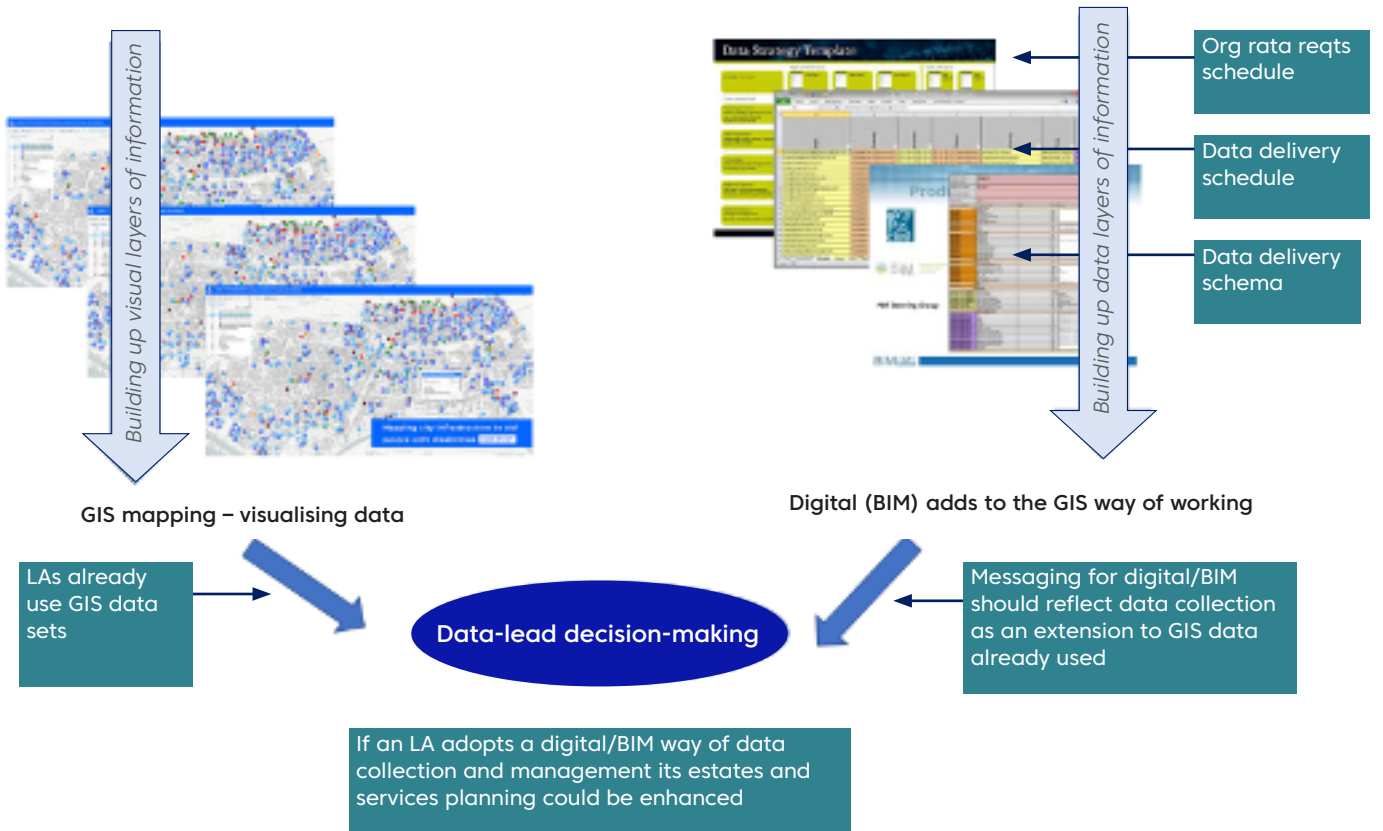## BIM/digital asset and service delivery life cycle

Fig. 2

BIM/digital asset and service delivery life cycle

Example of growing an LA data set –
currently, GIS mapping information is used and understood, articulating BIM as a layered data source that works with and widens an organisation's data access that can be worked up to provide a good working example for adoption in any funded video/tool kit resources.

Building up visual layers of information

Building up data layers of information

Org rata reqts schedule

Data delivery schedule

Data delivery schema

GIS mapping – visualising data

Digital (BIM) adds to the GIS way of working

LAs already use GIS data sets

Data-lead decision-making

Messaging for digital/BIM should reflect data collection as an extension to GIS data already used

If an LA adopts a digital/BIM way of data collection and management its estates and services planning could be enhanced

Appendix 3
Stockport case study

Stockport Council case study –
BIM journey to date

Charlotte Cordingley – 30 March 2020

Drivers for change

- The key drivers were to bring forwards efficiency and effective decision-making on how the spectrum of property services needed to be delivered in the future to meet the pace of change for the challenges that the public sector estate faces, following the collapse of the previous provider of property services for the authority. The previous property provider held the Council's data, and there was a reliance on the third-party holder of the data, which meant the process to obtain the data was laborious.

- The public sector is often seen as not being modern in its approach, and the delivery of estate and asset management services within the authority needed a radical facelift.

- Through targeted reviews it was identified that the processes for the delivery of property services could be much improved, and therefore an exploration journey (discovery phase) was entered into to find the best solution. This linked into the detailed exploration of BIM methodology and the benefits to be derived from better process deliverability and capability of a modern digital environment.

- A better experience was required for those occupying facilities who are ultimately the customers of the products and services that we deliver.

- In an age of digital revolution, there was a need to ensure that property doesn't get left behind, being seen as a traditional 'bricks and mortar' approach, but can adapt quickly to change and new technology. The changing service provision and expectations of property as being more than just a box to transform public services can show how assets can support or detract from public expectations.

- Need to deliver services that are much more cost-effective to the public purse. To meet the needs of current and emerging budget pressures.

- Better data-driven environment focused on whole-asset life-cycle costs is essential for planning new buildings and in operational buildings.

Journey

- Exploration of opportunities with a number of industry leading experts and development of networks to gain a greater understanding of the benefits and methods to implement BIM.

- Step change.

- Working with other local authorities and sharing the journey to encourage others to join the journey.

- Appointment of specialist BIM leaders from design and asset management industry sectors to support the implementation of the process and roll-out across the organisation. Quicker routes for delivery rather than training the entire team from scratch.

- Stakeholder engagement with legal, finance and planning people to ascertain what levels of data were required.

- Training and common language was essential to ensure that all stakeholders within the organisation were able to input into the organisational information requirements to define what outputs were required from the authority's assets.

- IT systems needed to be modern and fit for purpose, which required a robust business case to invest in systems for the future. This was undertaken by an assessment of the systems required to meet the framework standards, including 3D design and a common data platform to share information with key stakeholders in an appropriate form. There are various products available, and each will have different benefits that need to be fully explored using a cross-section of stakeholders to understand the capabilities of existing systems from an IT delivery perspective to the design and asset management teams that will be using them on a daily basis, and how these will be used to present client information in a useable form that is straightforward to comprehend.

- To begin with the authority implemented a light-touch proof-of-concept approach prior to full investment in the new process. This included Sharepoint access with contractors for sharing data in the tender and implementation of capital projects, which allowed for a common data environment approach that was cost-effective to assist with any perceived cost barriers to entry. Following this proof of concept the systems that the authority has chosen to implement are Revit Autocad, Concept Evolution CAFM, Civica Norwell and Sharepoint. There are many other systems available that will suit various organisational requirements, depending on various things, including hardware and server capability.

- Intelligent client design function to take some of the risk out of the design and contracting process.

- Developing a suite of documents that met the requirements for numerous asset classes required investment in resources to create these from scratch. This required a number of workshops and a deep understanding of the way in which a local authority is led from an operational perspective, as well as the fundamental priorities in delivering complex public services.

- Following the collapse of the previous property provider, a procurement exercise has been undertaken to secure a new facilities and asset management provider, with a key requirement of the new service being to work with the authority on the implementation of the BIM framework up to the top level across all areas of property services, from design through to estates and asset management. This allowed the authority to engage with stakeholders to share knowledge and tools across a range of key areas of expertise and systems, which provided value for money.

- Following the exercise to work with stakeholders to ensure that the Council had full control of all asset data, it was essential that the new service provision was robust and managed in a controlled way to deliver effective data-sharing platforms that key resources could access and deliver through a structured process with BIM. The Council shared experiences with other organisations that had been through a similar process, and there was a fundamental general willingness to support one another.

Take-aways

- With competing demands in an increasingly varied environment it is essential for positive leadership to make the decision for change and ensure that this is driven in a proactive way throughout any change process when implementing a new culture and way of working. Staying focused on the key product/outcome of a new innovative process for delivery of asset management is essential when faced with blockers along the way.

- Developing a network of key industry experts that are willing to share their knowledge, experience and key challenges is essential to swiftly overcome any obstacles to implementation.

Successes

- Greater collaboration and deeper understanding of different technical disciplines across a range of industry experts, and how these professionals each support every element of the building design, construction and operational life cycle.

- Implementing some elements of standardised components in design, a bespoke suite of contracts designed to respond to BIM requirements, and a robust suite of technical information documents has contributed to tender pricing that is competitive using a 'should cost modelling' approach, even when addressing additional requirements for BIM design, which can see an increase in design costs in certain circumstances.

- The Council started with a low entry point on the BIM framework using Sharepoint, which proved to be a very useful proof of concept to enable investment in the next stage of the framework.

- The development of the OIR, AIR, EIR documents allowed greater collaboration across all disciplines, and showed early on in the procurement of new construction projects that the whole approach was proving to have cost benefits for the Council. 'Should cost modelling' was achieving competitive outcomes for the Council, with contractor feedback that, with the greater data sharing and development of detailed OIR, AIR and EIR, there was much greater clarity about what was being procured and delivered from an intelligent client and informed contract perspective.

The enhanced data sets have allowed a more in-depth, look-forward plan-through in the asset management programme, with a healthier view on what investment is required into the five–ten-year investment programme. This has also enabled the low-carbon agenda to drive strategic planning and decision-making, with the data being stored in one place to make whole life-cycle cost-benefit analysis.

Special interest group membership

Participating organisations:

Contact information

Further information

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