DRIVE TO DIGITAL REPORT

WHAT DOES DIGITALISATION MEAN WITHIN FACILITIES MANAGEMENT AND REAL ESTATE?

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PREFACE

The digital transformation is happening.

We here at Cleverly do not think it is possible to avoid its impact if you work within the workplace and facilities management industry.

More importantly, we don't think you should want to.

Advancements in technology offer huge opportunities for those operating within the sector. As facilitators of clients' productive activity more broadly - ensuring that machines are operational, spaces are utilised, employee wellbeing is maximised - facilities managers can make meaningful impact to their clients top and bottom lines.

Facilities managers provide the platform upon which their clients build their businesses. By ensuring that this platform is digital, facilities managers will get the flexibility and functionality to ensure that their business grows as well.
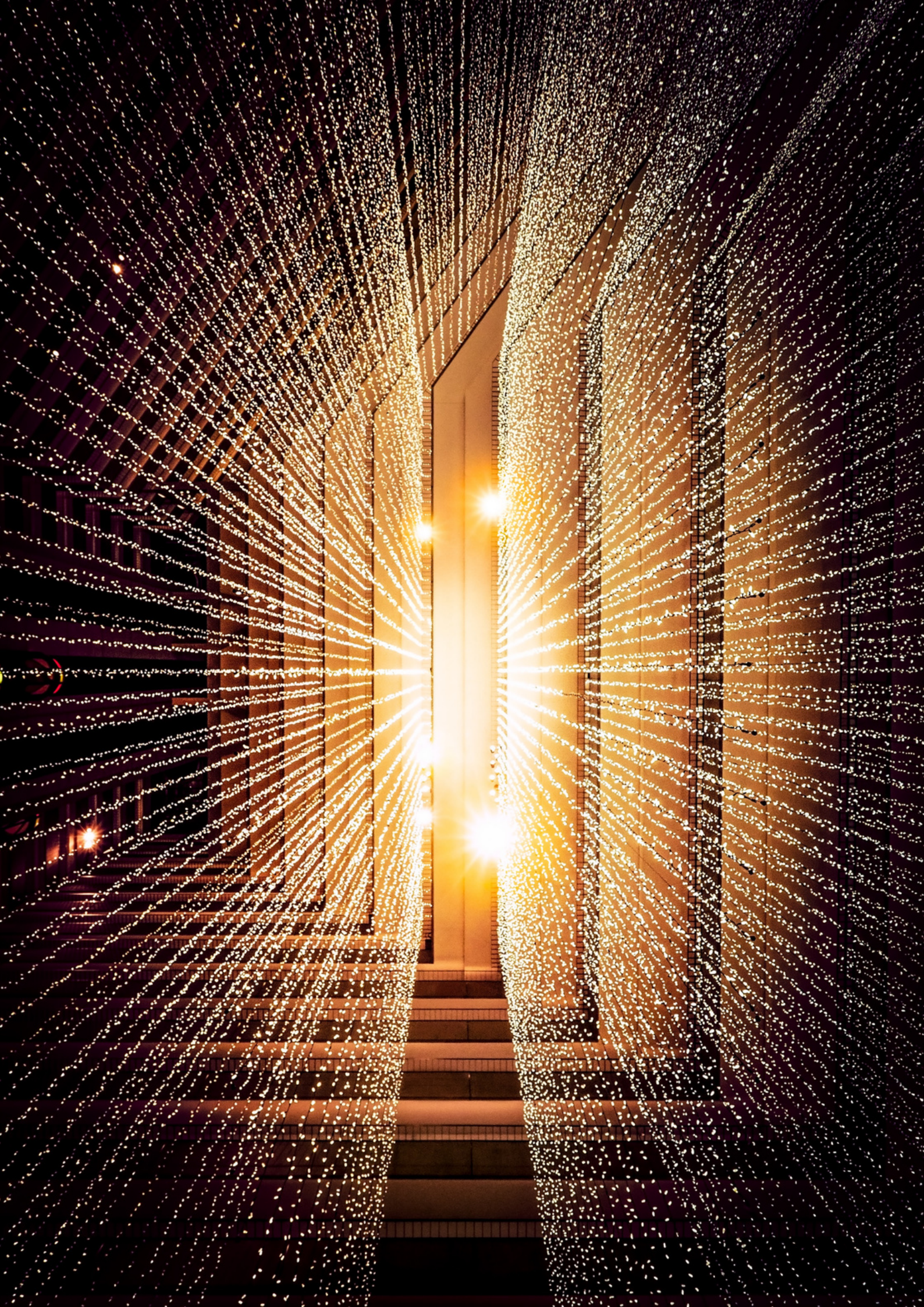
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INTRODUCTION

"More than 50% of commercial buildings in the UK have no digitised record keeping of property maintenance or building management."

Just let that sink in for a moment.

How many industries - and property management is a £25 billion industry in the UK - are still unaffected by, or resistant to, the impacts of technology?

That £25 billion just relates to the costs of the property management itself. If you consider the spend on the physical property as well (and still ignoring, for example, things like energy costs) this is a more than £125 billion market.

And maybe that is the problem …

The scale.

To be honest, I don't believe that this is the only (or even the primary) reason for the lack of advancement by technology into the space. There are reasons related to demographics, historic underinvestment, the fragmented nature of the market, the industry's branding. Each and every one of them plays a part.

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I should also add that as a company that develops software for the industry, we know that the sheer complexity of operations within the built world make digitising (let alone digitalising) facilities management a daunting prospect.

But there is no doubt that this is changing. Advancements in technology will make these challenges more easily overcome and the cost/benefit analysis of workplace and facilities management is shifting in favour of the industry. Businesses can no longer afford to ignore the impacts of technology on their industry.

There are general purpose technologies such as artificial intelligence and machine learning that are going to have a huge impact on all companies as well as applications of advancing technologies such as IoT that have more direct effects on the facilities management industry.

According to McKinsey, the speed with which companies have increased their use of advanced technologies in operations and business decision making have both accelerated more than 25x versus expected levels prior to the crisis. At Cleverly, we deliver technology solutions to clients, and we are yet to see a situation where a company installs or utilises technology and then decides to remove it subsequently. Optimise and improve the technology - absolutely - but not revert to previous (pre-digitised) methods.

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EXECUTIVES SAY THEIR COMPANIES RESPONDED TO A RANGE OF COVID-19 RELATED CHANGES MUCH MORE QUICKLY THAN THEY THOUGHT POSSIBLE BEFORE THE CRISIS

Time required to respond to or implement changes. Expected vs actual (number of days)

Increase in remote working and/or collaboration
Expected: 454 **Actual:** 10.5
43x

Increasing customer demand for online purchasing/services
Expected: 585 **Actual:** 21.9
27x

Increasing use of advanced technologies in operations
Expected: 672 **Actual:** 26.5
25x

Increasing use of advanced technologies in business decisions
Expected: 635 **Actual:** 25.4
25x

Changing customer needs/expectations*
Expected: 511 **Actual:** 21.3
24x

Increasing migration of assets to the cloud
Expected: 547 **Actual:** 23.2
24x

Changing ownership of last mile delivery
Expected: 573 **Actual:** 24.4
23x

Increasing use of nearshoring and/or insourcing practices
Expected: 547 **Actual:** 26.6
21x

Increased spending on data security
Expected: 449 **Actual:** 23.6
19x

Build redundancies into supply chain
Expected: 537 **Actual:** 29.6
18x

*For instance, customers' increased focus on health/hygiene
Source: McKinsey & Company

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It is important to also note that there are still advantages to be amongst the leaders in adopting new technologies, and devoting a higher percentage of resources to implementing these new technologies.

EXPERIMENTATION WITH AND INVESTMENT IN DIGITAL TECHNOLOGIES HAVE BOTH PLAYED A KEY ROLE IN HELPING COMPANIES NAVIGATE SUCCESSFULLY THROUGH THE CRISIS.

Respondents reporting very effective responses to COVID-19, %

Were first in their industries to experiment with new technologies during the crisis

72

Invested more than industry peers in digital-related capital expenditure

67

Were not first to experiment with new technologies during the crisis

33

Did not invest more than industry peers in digital-related capital expenditures

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Source: McKinsey & Company

For these companies, not only did they increase their revenues as a result of implementing new technologies, they also saw significant cost efficiencies.

Technology has been playing a role within the facilities management industry for many years. In the first instance it was primarily the purview of keen technologists and early adopters who found ways to use 'new technologies' within their organizations. Of late, the increasing availability (and decreasing cost) of solutions such as IoT sensors and artificial intelligence/machine learning mean that the role of technology is growing in importance. Coupled with the interoperability of various systems and solutions, the industry is ready for mass adoption. Data are being captured and clients are expecting it to be put to use. Digital transformation within the built environment is happening and the facilities manager is sitting in the centre.

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SO, WHAT IS DIGITAL TRANSFORMATION?

Let us start with a general definition of digital transformation.

Taken from Salesforce: **"Digital transformation is the process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences to meet changing business and market requirements. This reimagining of business in the digital age is digital transformation."**

To paraphrase the above, digital transformation involves using technology to do things such as streamline operational processes, offer new products and services, enhance customer value and/or reduce risk.

As is likely evident from the quote above, digital transformation transcends any particular area of a company's operations. It is not limited to sales or marketing, finance or field operations. As we see processes and information storage moving from being paper-based to spreadsheets and onto purpose-built, smart applications digital transformation allows companies to reimagine how they can work today and benefit from existing and emerging technologies. If there is a unifying element in digital transformation, it is one that sits outside the company completely: the customer.
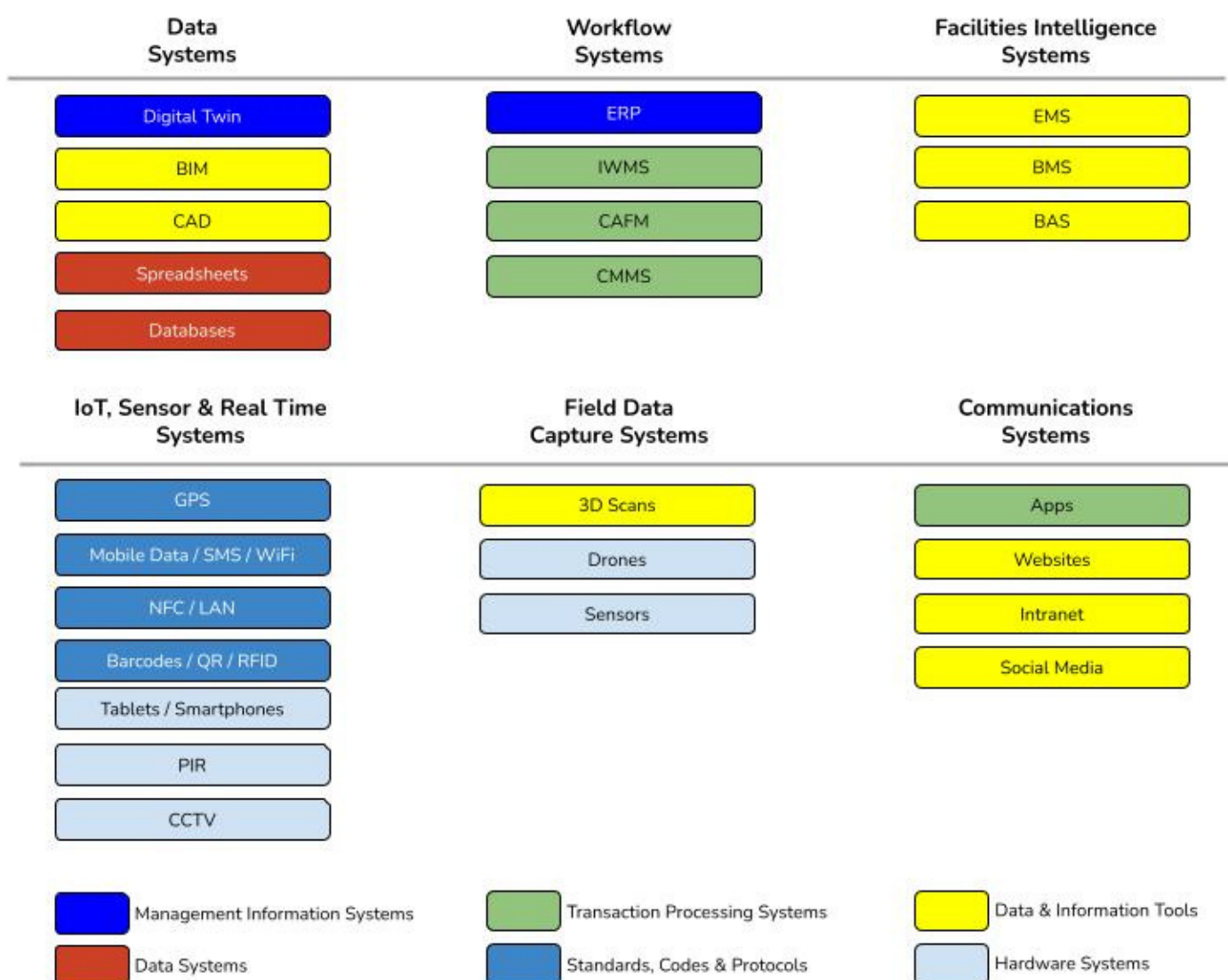
As Marc Benioff, CEO of Salesforce noted: "Every digital transformation is going to begin and end with the customer."

What we at Cleverly have noticed, and what provides us huge optimism for the likelihood of real, meaningful change in the facilities management industry, is that much of the impetus for digital transformation is coming from customers.

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WHAT TECHNOLOGIES ARE USED WITHIN FM & REAL ESTATE?

There are a multitude of software systems and solutions being used within the facilities management and real estate worlds, each with different functionalities and to different ends. Below is a framework which may be helpful for examining the various areas in which technology is being used at present.

Data Systems

- Digital Twin
- BIM
- CAD
- Spreadsheets
- Databases

Workflow Systems

- ERP
- IWMS
- CAFM
- CMMS

Facilities Intelligence Systems

- EMS
- BMS
- BAS

IoT, Sensor & Real Time Systems

- GPS
- Mobile Data / SMS / WiFi
- NFC / LAN
- Barcodes / QR / RFID
- Tablets / Smartphones
- PIR
- CCTV

Field Data Capture Systems

- 3D Scans
- Drones
- Sensors

Communications Systems

- Apps
- Websites
- Intranet
- Social Media

Legend:
- Management Information Systems
- Data Systems
- Transaction Processing Systems
- Standards, Codes & Protocols
- Data & Information Tools
- Hardware Systems

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Inevitably, in looking at the above there are areas and overlap and a degree of subjectivity about the classification of various forms of technology. An alternative to the framework proposed above would be usage-based classification, which can be undertaken as follows: Usage based classification of technologies, within the facilities management and real estate sectors.

i) Data creation technologies
used to create baseline data sets as prerequisite for all other usage

ii) Process supporting technologies
for use in supporting specific operations related work processes

iii) Utilisation information technologies
used to capture information related to usage and utilisation of resources

iv) Building automation technologies
used to monitor and control facilities

v) Data analysis technologies
used to analyse data generated above

vi) Service supporting technologies
used in the delivery of service and management of relationships.

Again, each of these technologies should not be considered in isolation but instead as a contributor to the digital ecosystem that exists around facilities and real estate. Data can be considered to flow from one area to another and be used in conjunction with systems from different classifiers to achieve users' objectives. One way of tracking data through this system is as follows:

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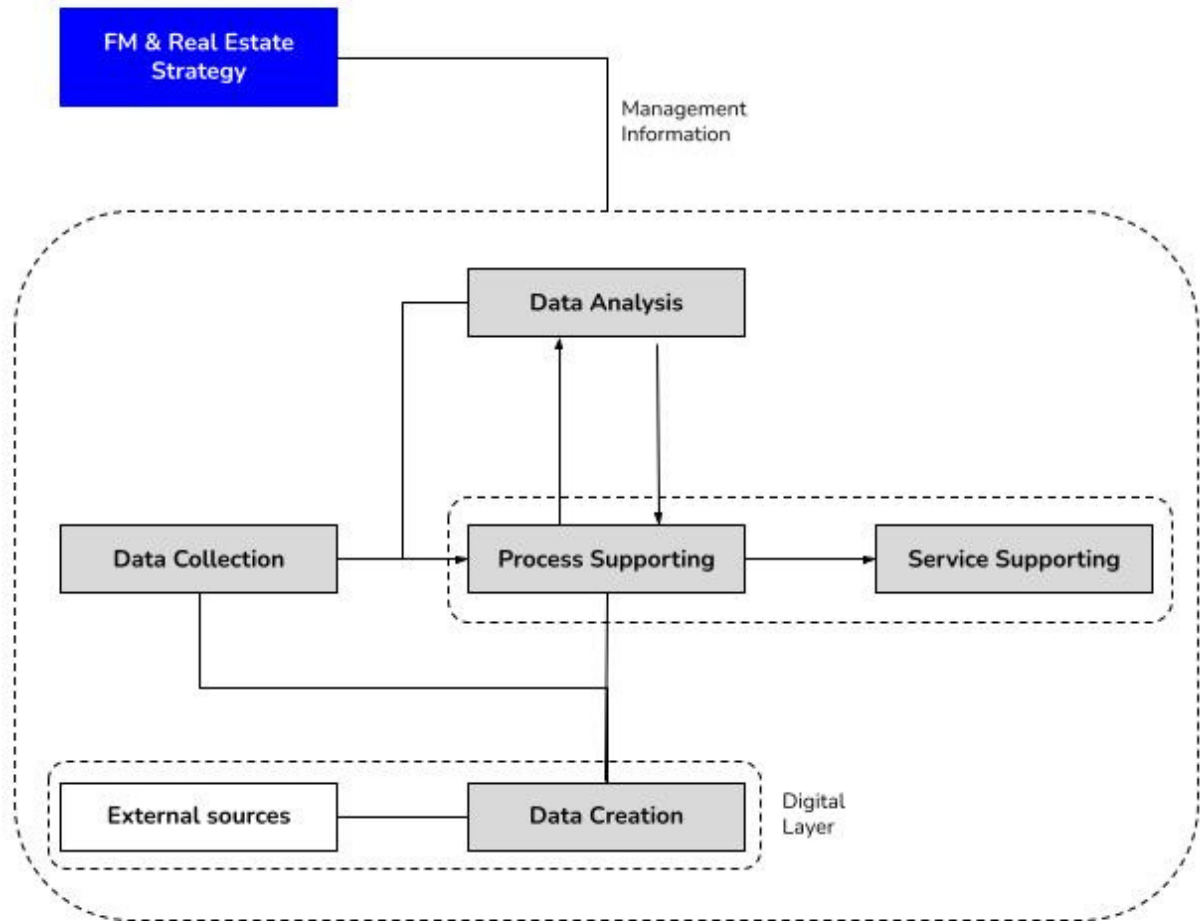
Based on the above, one can see how critical the facilities manager is to the overall strategic direction of management, and how the generation, collection and frictionless flow of information of data around this ecosystem becomes self-reinforcing.

This allows facilities managers to strengthen their relationship with companies and clients by delivering knowledge. In order to do this they must first collect data and create the digital layer of facilities, harnessing technologies within the 'data creation' classification.

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THE DRIVE TO DIGITAL

Simplistically, digitalisation relates to creating, capturing, storing, analysing and using data via hardware and software in the pursuit of achieving stated goals. These goals and the data required in achieving them differs from one situation to another. In all instances, however, the facilities manager should be asking herself:

Which data are required?
Which digital technologies can I use to capture them?

The creation of the digital layer, ensuring that the required information is being generated is often the most time consuming part for facilities managers, and will then dictate what is required in terms of storage and subsequent digital requirements. Before committing

VALUE CREATION THROUGH DIGITALISATION

As you will see below, there are a number of ways in which digitalisation can have positive effects for both facilities managers/FM suppliers (the supply side) and their corporate employers or clients (the demand side).

The various ways in which these positive effects manifest themselves call for different means of measurement. One should not, however, underestimate the power of data in improving relationships between the supply and demand side. By tracking information, the demand side not only has the ability to allocate their own resources more efficiently but can deliver benefits to their clients as well.

Very often knowledge gaps, or subjective interpretation of whatever data are available are the main causes of breakdowns in relationships and poor outcomes for both parties.

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CREATING VALUE

It is important to consider all direct and indirect effects from FM strategies. As an example, obtaining best in class sustainability practices may have short term costs, but will have long term benefits in terms of attracting desired employees, brand reputation and e.g. reducing time lost to sick days for office-based staff.

It is also important to note that in determining goals and calculating value creation, the first steps in the digitalisation journey (creation of the digital layer) must have been done in order to have a robust data set from which to draw information. Likewise on the cost side, for example where training is required for parties in order to get them to use the system and subsequently deliver the desired returns on investment, this should be included in the cost curve for the project.

PROJECT S-CURVE
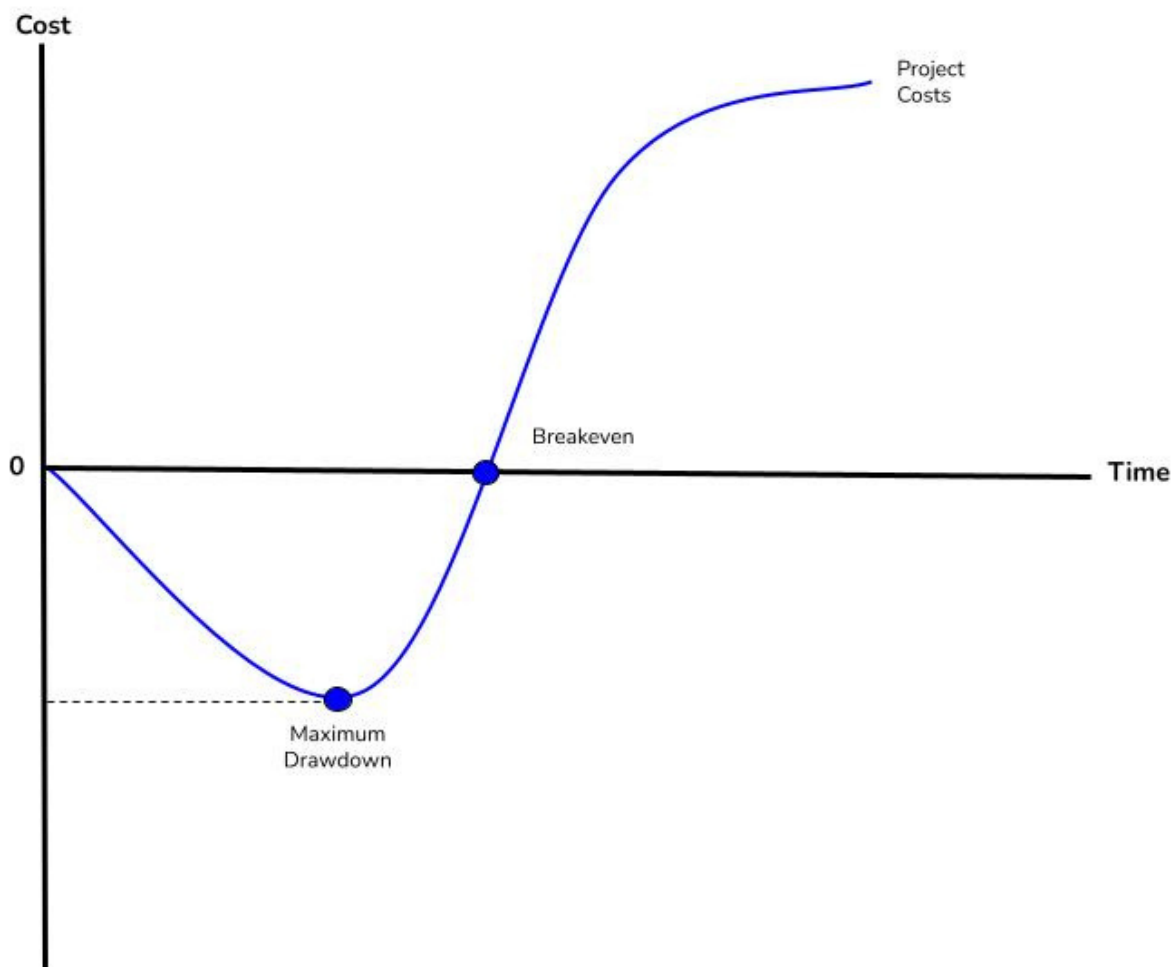
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WHY IS DIGITAL TRANSFORMATION HAPPENING WITHIN FM NOW?

Prior to the pandemic, the momentum around facilities (or workplace) management typically revolved around employee wellbeing and enhancing their productivity within the workplace environment. There was a considerable push by customers for data around space usage and resource utilisation; booking systems for meeting rooms and desks. The former of these is an example of how digital transformation has changed operating processes. Occupancy data and usage patterns were not long ago recorded by people physically located in the space, writing down the information for entry into some spreadsheet software at a later date. Today, this is done 24/7 using IoT sensors where the data can be pushed wherever necessary using built in APIs. Data are obtained more cheaply and have increased hugely in terms of their completeness.

In the shadow of COVID-19 there are additional customer push factors such as: the desire to enforce occupancy limits; ensuring that cleaning schedules and protocols are linked to resource usage; moving from static to hot desking or flexible working; redesignating spaces to new functions or form factors, and ensuring air quality levels are satisfactory.

These are all on top of the underlying desire of clients to reduce maintenance spend; improve total cost of ownership (TCO) of assets; reduce downtime of plant and equipment; increase visibility around supplier and asset performance and improve the accuracy of forecast expenditure.

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When customers repeatedly ask for something, suppliers will deliver it. There will be subsequent phases in the digitalisation of the built world where performance levels of the solutions differ to a degree that competition will increase on this basis, but that stage is yet to come. Clients want a solution implemented, and for now, that is often sufficient. It's more a UX issue than UI.

And all of these are only the demand side dynamics within the industry. When we add in the impetus coming from those on the supply side such as facilities management companies, we must include the desire for increased operational efficiency; easier client reporting; a closer link between work and wages; greater availability of data; increased lead times and opportunities to demonstrate outperformance.

WHAT DOES DIGITAL TRANSFORMATION MEAN IN FM?

Digital transformation means different things depending on the company, and the degree to which they have already digitised or digitalised their offering. When we think about the fact that more than 50% of commercial buildings have no digitised record keeping, digital transformation could begin with moving records online.

For advanced manufacturing companies, their digital transformation within the FM space may be more focused on using sensors to collect data and implement a predictive maintenance strategy.

What can be seen in the above is that digital transformation occurs across a spectrum, and to whom the value is delivered tends to change as the digital transformation increases in its breadth or scope.

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Below we can see a way of considering various digital transformation initiatives and where the value from each will be realised. Don't worry about where exactly any particular elements fall, but rather look at them as reflecting a framework.

For facilities management companies, implementing a CAFM will have primarily internal benefits allowing them to better handle their own operations but less likely to deliver benefits to a client. Unfortunately, it is essentially a minimum requirement for operating with facilities management but that does not mean that it need not have a high return on investment attached (ROI).

Returns to facilities management companies in implementing a CMMS (computerised maintenance management system) can be up to 10% of the spend that is handled via the system. This compares to a CAFM (computer aided facility management) system which can deliver returns in the range of 10% to 30% of the maintenance spend, where some of that value is captured by the customer (an amount that will vary by the degree to which the FM company was involved in the digital transformation).

As we move up the value maximization curve, the digital transformation work moves outside merely the maintenance activities and are acting more in concert with the primary productive activities of clients, for example reducing their equipment downtime or improving employee productivity. Again, value primarily accrues to the clients in the situations but can be captured by the facilities management company in leading this shift.

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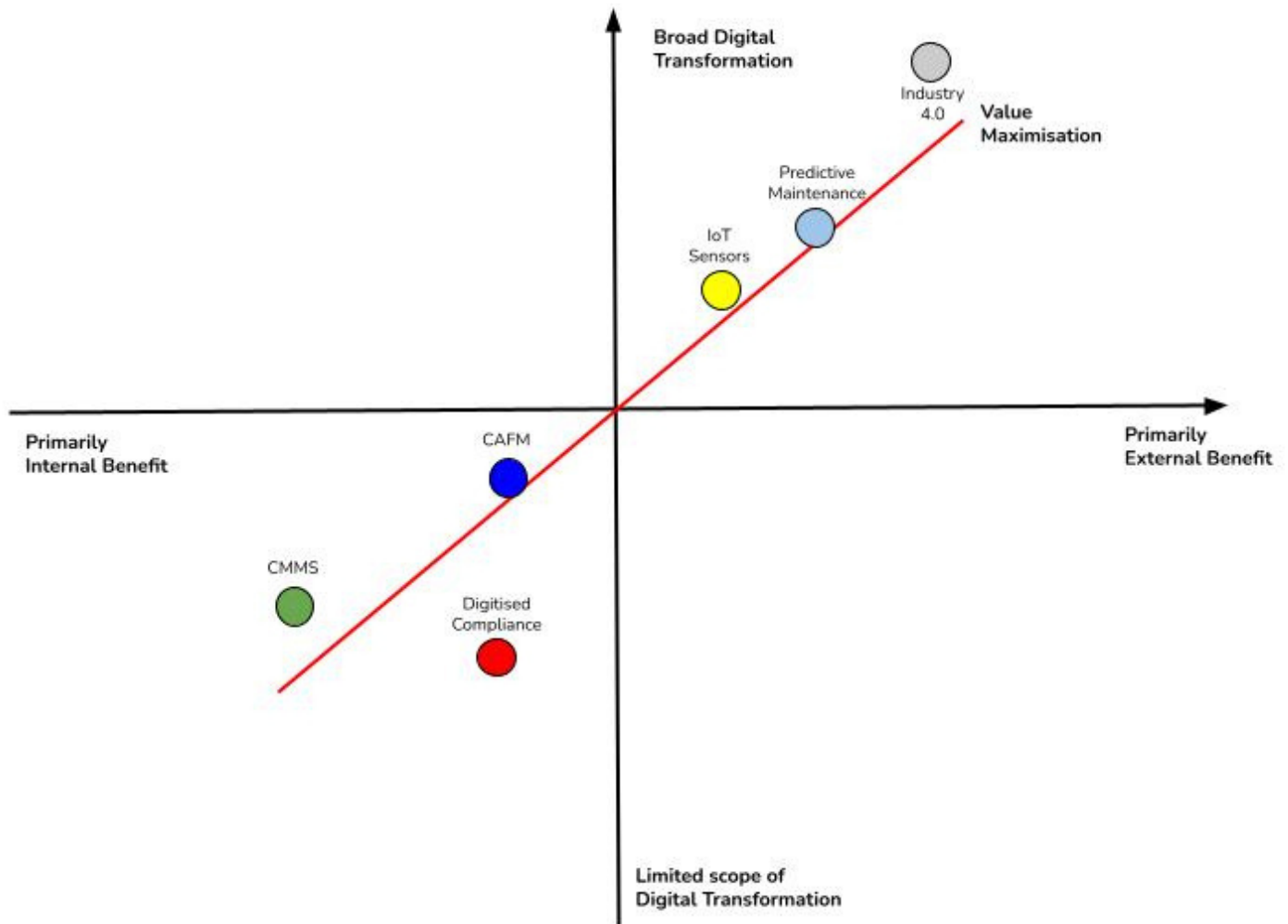
What should also be clear is that there is an accompanying cost curve that runs loosely parallel to the value maximisation curve. Whilst the returns for adopting an Industry 4.0 digital transformation strategy hugely outweigh those of digitising compliance records, the costs are commensurately higher.

Best practice is therefore to start on the digital transformation journey as soon as possible with a view to moving up the value curve over time.

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> ❝ *If I have a CAFM system: have I already completed my digital transformation?* ❞

As is evident in the chart above, digital transformation is a spectrum and where on this spectrum you fall will be determined by your business model, current service provisions and company objectives. Software solutions such as CAFM and CMMS have been around a long time and have been robustly tested within the FM world.

First, the use of a CAFM clearly demonstrates an understanding of the benefits that technology can bring. CAFMs have evolved and today's offerings are no longer siloed in nature, lacking the interoperability that is needed by many companies. Modern operators require integrations with finance or customer relationship management (CRM) systems that are often a primary pillar of their technology stack. They want to be able to offer their clients (and the client's clients) an interface that provides information about the building and its energy use; allows them to report issues; track work order life cycles and more.

Not every company needs to go 'full digital', but the opportunity now exists to do so.

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WHAT WILL BE THE IMPACT OF THESE CHANGES?

The increasing digitalisation of the facilities management industry is going to have tremendous impact for service delivery as well as for the clients thereof. As an illustration, we can consider two clients of facilities management companies who operate completely different businesses and will realise value in different ways: a manufacturing company and a professional services firm (such as a law firm).

In delivering services to the manufacturing company, the FM company will be helping them support their Industry 4.0 objectives and the accompanying goals of reduced environmental impact and equipment downtime. To this end, the manufacturing company utilises mobile 'near miss' reporting from all employees on site, allowing any issues to be reported and routed via rules within the CAFM to the appropriate party. IoT sensors (for example, vibration sensors) have been installed and provide real time data around operating performance of equipment. Algorithms are overlaid to determine optimal repair and replacement strategies based on customer inputs around downtime costs and production schedules. Inventory levels for the required parts are monitored and ordered in advance. Environmental monitoring is used to alert the appropriate parties should there be conditions outside of thresholds set for optimal operating efficiency of the equipment. Spend analytics and operating data are available in real time and sent in pre-formatted reports at regular intervals.

Compare that to the professional services firm, who having moved to a hot desking office format need a system to allow employees to book desks when they need to be in the office, and to get context on how many others are, or will be, in the office. Meeting rooms and other shared resources likewise need to be able to be booked and mobile assets to be tracked to ensure they are in the appropriate place when required. Environment quality is critical with SLAs for the FM company around CO_2 levels and PPM (parts per million) particulate matter levels. In order to ensure these are maintained, the M&E systems are all controlled via the BMS (building management system). Sustainability goals are addressed through the energy management system for the building.

As you can see, the actual applications of technology differ from one client to the next but both are centered around the same goal: maximum productivity for the client.

WHY DO FM COMPANIES HAVE TO UNDERTAKE DIGITAL TRANSFORMATION?

Exogenous to the FM sector, all those of working age in the developed world have seen incredible advances in the performance and penetration of technology. Personal and professional lives have blurred and service level expectations and the availability of information has skyrocketed.

In 2020, an estimated 1.6 billion smartphones were shipped and along with them went expectations that they could be used 24/7/365 to do everything from book taxis, check bank balances and access work information. Many of these are clients of FM companies, or employees thereof. At the end of every value chain is a customer and the FM customer's customer is their colleague or employee.

Again outside the FM industry but a megatrend that will have an impact across all aspects of business is the need for data around sustainability. This is the initial stage before actions can be taken to reduce the environmental impact of companies - and some companies are in a more advanced state on this than others. The role of FMs will be key to obtaining existing levels related to physical premises for example via their building management systems (BMS) and the installation of sensors. Additionally, via examining space usage and utilisation patterns, FMs will be able to work with clients to ensure they have the minimum physical footprint possible. Some of these may also become mandated by regulatory bodies (see below).

Within the facilities management industry itself, the fragmented nature thereof means that participants have no pricing power. Whilst costs have been increasing by virtue of inflation (at least), margins have declined and it is not uncommon for contracts to be bid on profit margins of 2 to 3%. It is no surprise that there have been a number of bankruptcies and firms entering administration.

Whilst companies operating within the space cannot control the number of other players, what they can do is differentiate themselves from their competitors and improve their value proposition to clients. Both of these options require, and are supported by, the collection of data.

 For companies to win business over the near to medium term will require them to have knowledge of, the ability to implement and an awareness of the benefits of, digital transformation for themselves and their clients. Whether this is in the first instance to improve the efficiency of their own operations, or over the medium term to generate value for their customers (and capture a portion thereof).

We have seen increasing levels of regulation and compliance within the facilities management space and this looks unlikely to end any time soon. Compliance is a critical element of facilities management companies' responsibilities and in being able to satisfy their clients' requirements on a cost-effective basis, FM companies will need to make use of technology. As an example, using sensors, FM companies can avoid the need to do the in situ tests for legionella assuming that normal usage has performed this function on their behalf. With the need to do these checks monthly, and then record the information (let alone store it and make it accessible) this simple IoT implementation can save thousands of hours of site attendance per year, even across a small to medium sized client.

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THE FUTURE FACILITIES MANAGER

With all the ways in which facilities managers are impacting a company's operations, their titles and skillset is also changing. The future facilities manager is multidisciplinary in nature working across human resources, IT and premises to deliver the solutions that aligns with a corporate strategy. Witness Airbnb and Ericsson's 'Chief Employee Experience Officer' designations.

Facilities managers will be focused on delivering the physical framework under which employees can contribute and thrive, acting as facilitators to ensure that optimal business outcomes are achieved.

Just as digitalisation is impacting the facilities management industry, it is impacting their clients' industries as well. With her ability to impact likely the largest cost items in her clients businesses - namely their employees, their real estate costs and their environmental impact - the facilities manager will find themselves more deeply involved in a client's business.

With this increased impact will come the need to be able to think strategically, adapt and anticipate impacts on client business.

The way in which the future facilities manager can perform in this enhanced and expanded role, we can consider each of these in turn.

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HELPING ATTRACT TALENT

The war for talent has never been more intense than it is today. With increasing use of automation; a move toward 'the knowledge economy' and greater dynamism in the labour market generally, attracting the best employees and having them operate effectively as quickly as possible is more important than ever.

Companies compete across industries as prior experience within any particular role or business becomes less important than the ability to utilise the latest skills and best practices. Banks compete with delivery startups which compete with media companies ... all in the pursuit of skills such as data analysis, whether these are used in customer acquisition or supply chain management.

The future facilities manager plays a role in building this corporate culture, facilitating the ability to let employees do their best work and deepening their engagement with the company, its vision and values.

SPECTRUM OF EMPLOYEE ENGAGEMENT
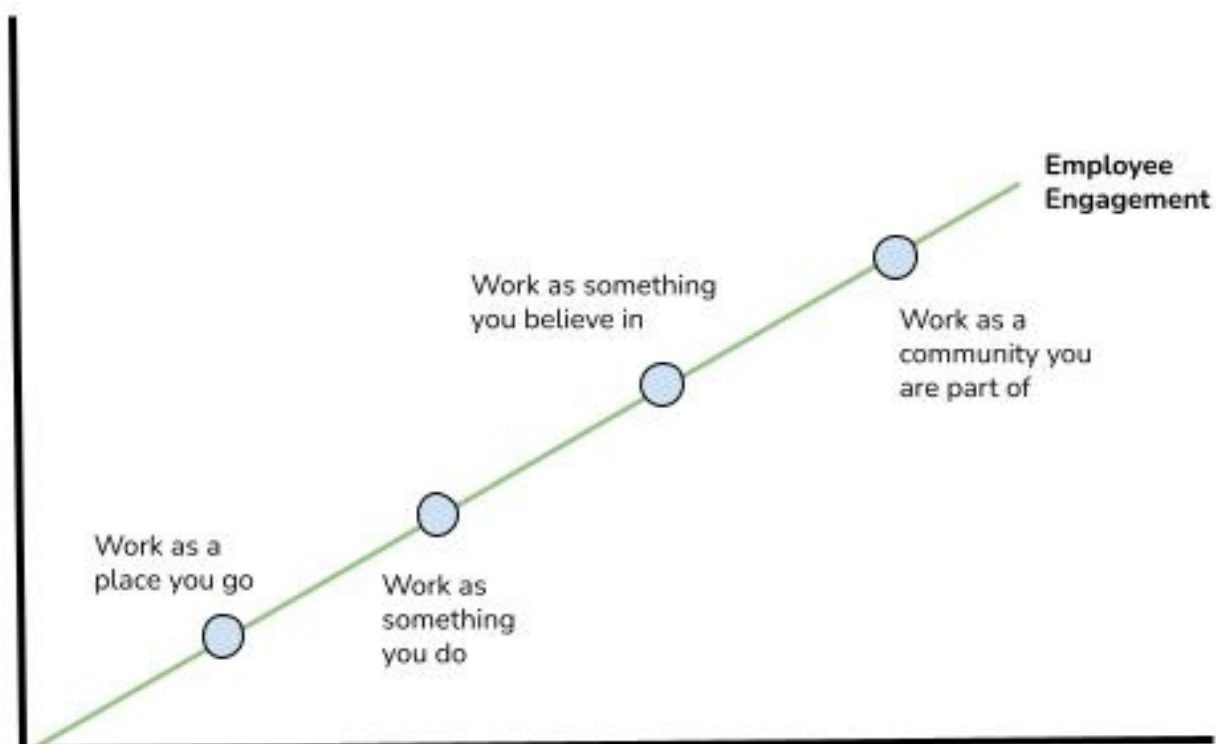
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OPTIMISING REAL ESTATE

In addition to cultivating corporate culture, the future facilities manager also has a role to play in ensuring that her client's or employers' needs are fit for purpose. To optimise real estate costs whether this be in reducing unused or underutilised space, or ensuring that premises are optimised for function. This means installing and utilising technologies such as resource booking systems (desks, meeting rooms, studios, creative suites etc.); occupancy sensors; monitoring air and environment quality; agile workplaces and ensuring plant, property and equipment uptime.

As companies employ increasing numbers and proportions of people on a temporary or project basis, the ability to have buildings that can physically scale up or adapt to their needs will become required.

Employees no longer work only in the office, but must be able to be productive and access required resources at all times. This is how corporate cultures and communities are built and fostered, and the future facilities manager has a key role to play across both the virtual and physical realms of a business.

REDUCING ENVIRONMENTAL IMPACT

In conjunction with the desire to attract the best talent and optimise real estate costs, the future facilities manager works in partnership with her clients or employers to minimise their environmental footprint. These objectives work hand in hand, as the most attractive employees must align with their employers in values. For a lot of them, one of the primary areas of focus is on their company's sustainability commitment.

In addition to impact on the environment at large, the environment in which the employees work is critical both in terms of its signalling to employees as to their importance to the firm but also in ensuring they can do their best work. Air circulation levels, air quality, the type and quality of lighting and the means of heating and cooling are key battlegrounds in the facilities manager's environmental credentials.

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DIGITAL TRANSFORMATION'S EFFECTS ON PRICING MODELS

Along with additional data will come a broader range of possible pricing models. Some of the trends that will likely become more common with the facilities management sector over the near term will include:

Outcome based pricing

By improving outcomes for clients, such as reduced maintenance spend or equipment downtime, facilities management companies can participate in the value generation.

Linking revenues to operating metrics provides a win-win for clients and suppliers. In a best-case scenario transparency from the customer will allow this to be made explicit but otherwise can be inferred from pricing.

Pricing/Matching objectives of clients

Critical to delivering value for customers will be addressing their wants and needs. By understanding where opportunities exist for clients to improve their service delivery and outcomes (and aligning with them) FM companies will strengthen their relationships with clients.

They will no longer be delivering to what they feel is important but what their clients have stated as such.

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Reduce commoditisation

A commonly held belief is that facilities management companies are interchangeable. When data are not being measured it is very easy to argue that this is the case, and has led to competition being on the basis of merely two dimensions: price (easily quantified) and service (always a more qualitative assessment).

This allowed facilities management companies to at least break the direct link to price. Data will allow bids to be made on the basis of expected outcomes based on data and paid on the basis of realised outcomes (see above).

Capture value

Similar to outcome based pricing, and already used to some degree in the form of bonus payments, this will become more prevalent as data become more available. For example, if a facilities management company can reduce equipment downtime by 25% and this reduction is worth £500,000 to the client, being able to share in these gains would incent facilties management companies to deliver, and therefore further differentiate.

Most commonly, the barrier to doing this is obtaining the data from clients but a control period can be used in the initial stages of the contract.
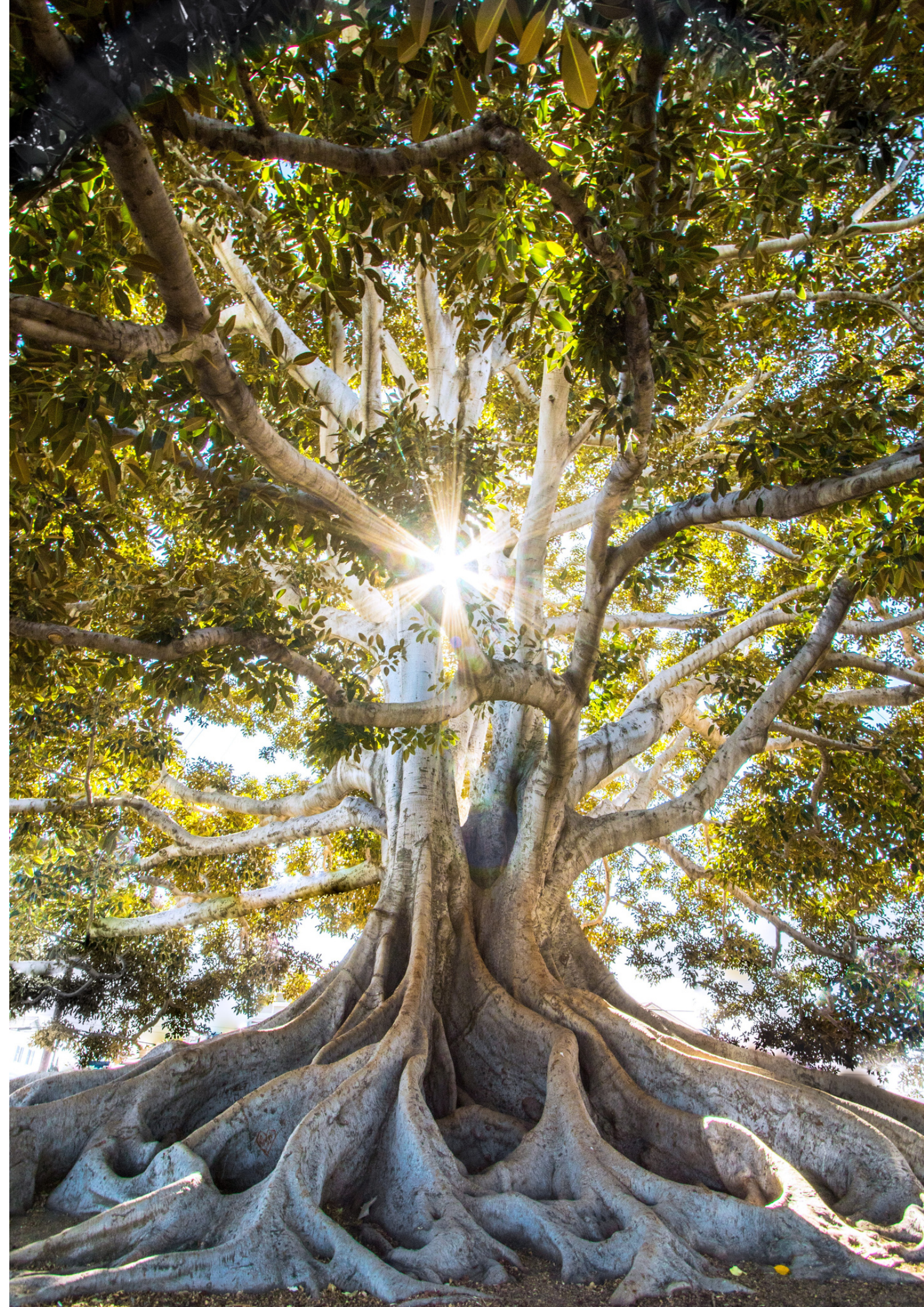
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SUSTAINABILITY AND FM DIGITAL TRANSFORMATION

It is little wonder that the FM industry has a huge role to play in sustainability. Whilst not direct contributors in terms of, for example, the contribution of the built environment to CO2 emissions facilities managers are still integral in ensuring impacts are as low as possible. When one considers that the need for facilities is itself a function of space utilisation and management; and that energy management systems will affect emission levels, as will the proper functioning of plant and equipment ... all of these have one common element. The active role of a facilities manager.

With an increasingly global response to climate issues via such frameworks or agreements as the Paris Agreement and the United Nations' Sustainable Development Goals (see below), the opportunity for facilities managers to participate in the desired outcomes is tremendous.

Thankfully environmental and business objectives are often aligned, and in today's environment where signalling of ESG stance carries increased weight amongst consumers and employees, that is more true than ever.

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Let us look at where facilities managers can have a direct impact in helping achieve the Sustainable Development Goals. Number 3 (Good Health & Well-being) is partly a function of the indoor environment and air quality for which a facilities manager will have responsibility. By monitoring levels of carbon dioxide, volatile organic compounds and particulate matter - and acting where required via planned maintenance and changing of filters or increasing air circulation rates, both productivity and health levels can be raised in building occupants.

Similarly, item 6 (Clean Water & Sanitation) will often fall under the remit of facilities and estate managers, Whether this is ensuring that water management strategies are in place or conducting regular inspections and monitoring for things such as legionella risks, again FMs are well positioned to move things forward. Perhaps number 9 (Industry, Innovation and Infrastructure) is the most logical area in which FMs function - and where digitalisation can help them in measuring and magnifying their impact. By maximising the useful life of assets, total cost of ownership can be reduced and carbon savings can be achieved. Using new technologies such as IoT sensors and artificial intelligence and machine learning in innovative ways will become commonplace within the FM industry.

In a similar regard, the built environment is the FM's playground and item 11 (Sustainable Cities & Communities) will also require their deep involvement. Via their involvement in Industry 4.0 efforts again through creation of optimised maintenance strategies and the remote monitoring of plant and equipment facilities managers can also assist in meeting objective 12 on the supply side (Responsible Consumption & Production).

These are just a few of the ways in which today's facilities manager can align with their clients and employers in achieving shared objectives around the environment. These objectives are at the centre of corporate strategies today and another reason for the increased importance of facilities roles.

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By utilising digital tools and technologies available to her, FMs can benefit themselves, their clients and the environment. Every situation will be different, and before being able to initiate a holistic approach to sustainable FM practices, companies may find that they need to generate control data sets or baseline current operating levels. In many circumstances, companies will have very little information as to where they are actually having an impact today, and providing - proactively if possible - this sort of information to senior management, FMs can play an important role in setting realistic targets, and indeed in achieving these objectives. Digital tools can make this happen.

We see there being three key areas in which facilities managers, and the adoption of digitalisation by these parties, can play a role in achieving sustainability goals:

1. Resource efficiency: the sharing economy and space maximisation
2. Energy management
3. Smart buildings and systems

RESOURCE EFFICIENCY: THE SHARING ECONOMY AND SPACE MINIMISATION

As mentioned previously, the built environment is a major contributor to the environmental impacts of which we will become increasingly aware. For example, 90% of hardwood resource utilisation occurs as a result of construction. Fully 80% of agricultural land loss is due to buildings and concrete causes up to 8% of global CO_2 emissions.

There are two obvious ways in which facilities managers can have a positive impact. The first is by maximising the usage of existing space. This not only means monitoring occupancy levels across physical spaces but also ensuring that these spaces are built to be agile and flexible and adapt to the needs placed on them. Further, by creating platforms that not only allow stakeholders to book resources, but also to allow them to be shared more easily, they can be far more efficiently utilised. These systems can also be used to allow users to participate in waste management strategies.

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ENERGY MANAGEMENT

Any FM strategy created today is likely to include sustainability objectives. And any sustainability objectives are likely to include targeted reductions in energy consumption and emissions. The UK has set ambitious targets on this front, as has the rest of Europe and the US. Thankfully there are an increasing number of tools at the disposal of today's facilities manager to allow her to realise these goals.

A common approach for companies is an increasing weight of renewable sources in their energy mix. Obviously this is not possible or suitable in every situation but with the increasing efficiency of conversion and advances in storage, the historic issues associated with such sources as solar and wine are decreasing in importance. Various efforts are being made to decentralise the provision of electricity via technologies such as the blockchain, however solutions in this area are nascent.

As can be seen in the above, these are still early days within energy management even though huge advances have occurred. Facilities managers can play an important role in moving this forward further and faster. With the ability to use robust technologies such as IoT sensors and energy monitoring systems, data can be captured by buildings - huge influencers in energy consumption - to craft strategies for tomorrow. Already systems can be used to minimise consumption, for example by sending employees to hot desks in proximity to colleagues to minimise the area of a building that needs light or heat. With more data will come an increasing number of strategies for reducing energy consumption.

SMART BUILDINGS AND SYSTEMS

As referenced above, digitalisation is not just coming to facilities managers' systems and processes. It is also coming to the premises itself. Via occupancy sensors, building management systems, energy management systems, automation and more, facilities are becoming the connective tissue in delivering sustainability goals.

Smart buildings (and smart cities, at a higher abstraction level) are typically focused on having the building respond to occupants' input, whether this is done passively or actively. This can mean that elevators are waiting for you when you enter the building and will automatically know to which floor you are going to go based on your schedule. Doors can open automatically using near field communication with your smartphone. Your morning cup of coffee may arrive once your desk has detected your occupancy. Wayfinding technology may provide you with the location of your next internal meeting, or your colleague's desk for today.

In all likelihood, the increasingly personalised interaction between your people and places is going to be achieved within the conditional framework of sustainability objectives. Available space may only be opened up on an 'as needed basis', once occupancy thresholds have been reached. Cleaning schedules may be determined on the basis of daily usage.

By creating networked spaces and devices (using IoT sensors for example) allocating resources to where they are needed, and deploying them more efficiently can be done on a coordinated and contextual basis. This has huge implications and the facilities manager is integral for deployment.

SUMMARY ON SUSTAINABILITY

The facilities manager has a key role to play in their companies and clients achieving their sustainability goals. In a number of circumstances this will start with creating baseline levels of consumption today in order to be able to quantify these intended reductions in environmental impact, for example through lower energy consumption or emissions.

This may require the facilities manager to be proactive in bringing to managers' attention the latest developments in the space and advising them of how they could be implemented. In all likelihood they will have a receptive audience.

Thankfully many technologies exist today to assist FMs in educating their colleagues and clients. By starting with data collection facilities managers can position themselves to have a meaningful impact on the environmental effects of the built world. Whilst it is not done at zero cost, the expenses required today are minimal and from a manager's perspective it makes business sense to be ahead of the curve (or regulation).
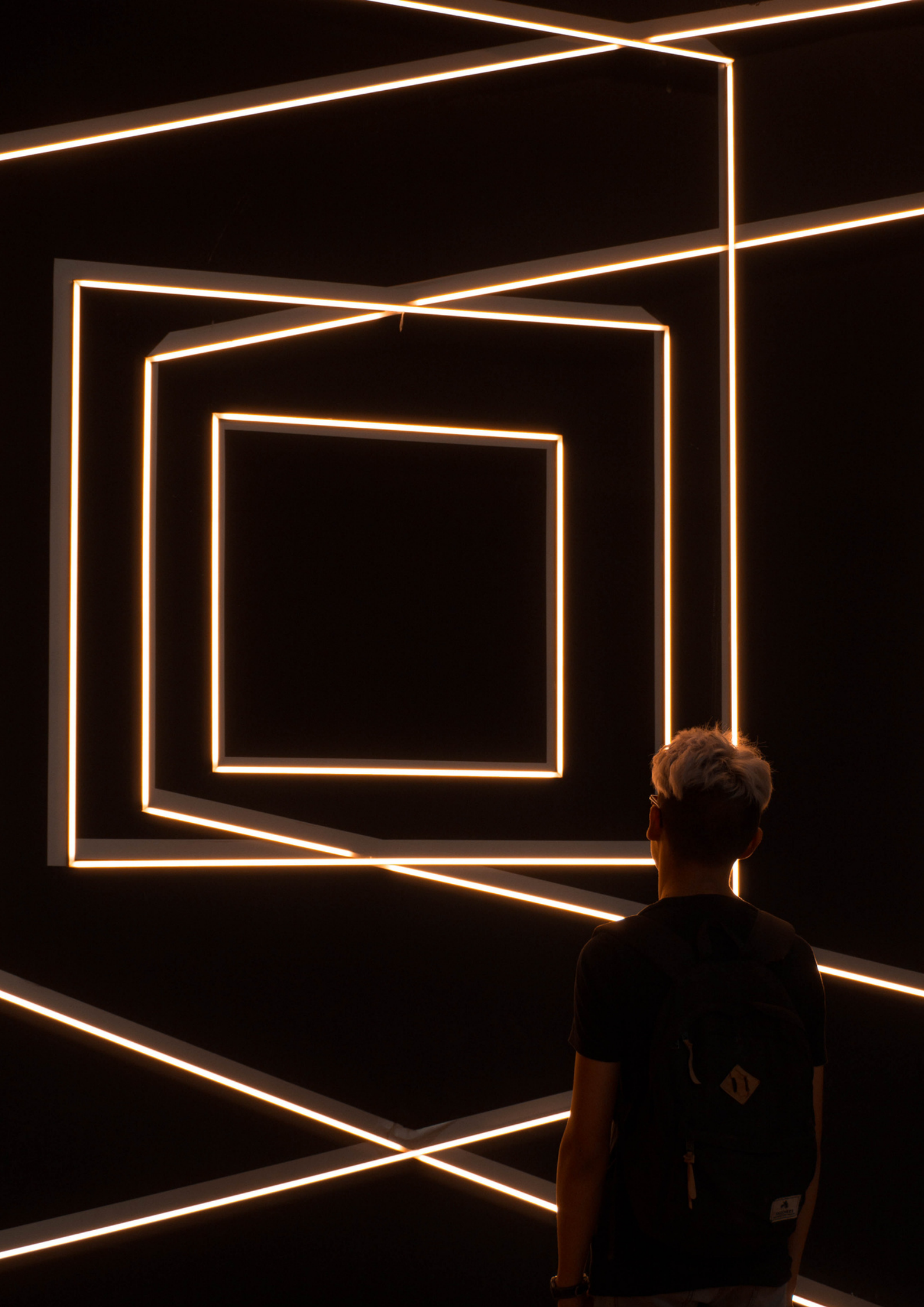
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DIGITALISATION AND SMART BUILDINGS MORE BROADLY

When the term smart buildings is used, typically this relates to the automation of operating and maintenance systems or processes within a space. Over the last few years the likelihood of adopting smart buildings technology has increased greatly as the costs of doing so have declined and advancements in interoperability via e.g. APIs have increased the benefits.

Having said that, the digitalisation of processes is still complicated and difficult. This is because companies tend to have their own practices and protocols when it comes to operations. In the operations area, it is typically more resource intensive to implement the required structural changes in the human elements of these processes as opposed to the deployment of the technology. The benefits however can be huge - removing the need for human intervention (an expensive resource) via automation and redeploying them to higher value add elements of their role.

Typically the central platform for digitalisation of processes and on which smart buildings can be modelled is the CAFM system. By centralising information related to workflow processes, budgets and spend, data capture (e.g. from sensors) decisions to go deeper into the world of digitalisation can be made within a richer context.

DIGITAL (SMART) BUILDINGS

In today's buildings, many aspects of their operations are already monitored and controlled by electronic systems, from HVAC to lifts to lighting, meeting rooms to fire monitoring to access. Whilst this has been the case for a number of years, the sophistication of these systems, and their ability to optimise for objectives such as energy consumption is still improving.

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Even though buildings are increasingly on digital foundations, these still need to support physical processes as well. For example, whilst elevators are monitored and controlled via systems, these still need to be subject to maintenance and servicing. Likewise with HVAC equipment. Even though temperature targets and circulation levels are controlled via a central system, there still exists the need for site attendances to change filters or undertake routine inspections. With the availability of technologies such as IoT sensors, these digital foundations can even be installed as an overlay to buildings that were not built to incorporate such technologies. Typically, however, the extent of their functionality is in monitoring, detecting and triggering alerts that require physical investigation. This is where it makes sense to use the CAFM system as the central hub for a digitised building. This is of particular benefit where operators have multiple locations and premises, so that they can centralise information and draw insights from their portfolio of properties rather than needing to access silos of information.

DIGITISED BUILDINGS

Different from digital buildings, which involves injecting functionality and feedback into buildings themselves, digitised buildings refers to versions of the building that exist outside the physical premises themselves. Examples of this include CAD models and digital twins.
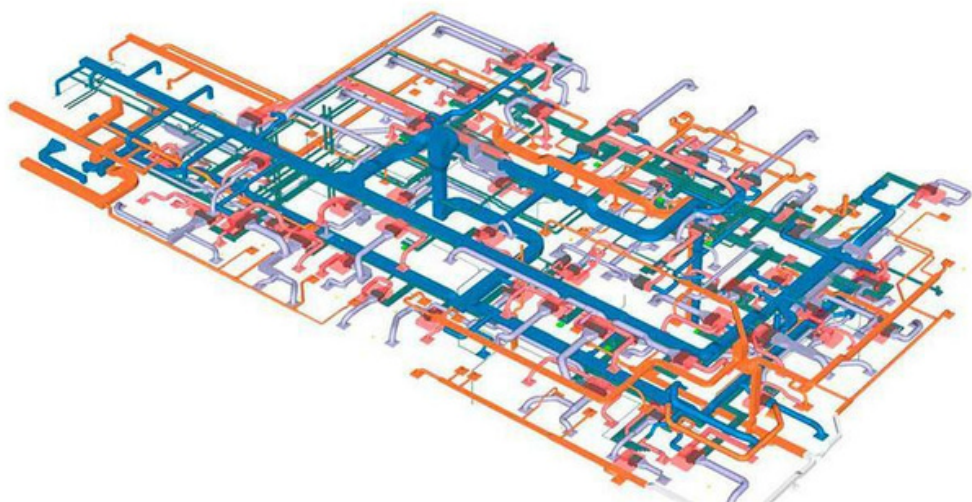
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The real value of digital models of buildings comes from their interoperability. For example, rather than sitting on the computer of a site manager (or managing agent), to have these models available to the appropriate parties such as facilities managers or engineers makes them infinitely more valuable.

THE VALUE OF DIGITAL

As in the above, when we talk about digitisation and digitalisation providing value to stakeholders such as facilities managers, management, engineers or employees, what is it that we mean?

Value can be provided in the following ways:

i**) Increased productivity**
Achieving the same result with fewer resources
ii) Improved results
Achieving a better result using the same resources
iii) Facilitation of strategy
Allowing strategic objectives to be achieved whether these affect resource utilisation
iv) Improved management information
Allowing management to think strategically whether or not related to resource usage

This illustrates that whilst the drive for digitisation may begin with the desire to have positive quantifiable effects, these need not be the only outcomes. Taking steps on the digital journey may open management's eyes to new opportunities and facilitate strategic goals.

CYBERSECURITY & FM

It would be remiss of us to provide this paper on how and why digitalisation is occurring within the facilities management industry without touching on the need for stakeholders to be aware of the security implications thereof. With the level of growth forecast for IoT devices within the built world, this could provide a weak point in companies' digital security that could be exploited to devastating effect.

Harvard Business Review reported in 2019 that "60% of all cybersecurity breaches reported in 2017 by publicly traded companies were launched through the computer systems of suppliers or contractors, up from less that 25% in 2010". Microsoft reported later in 2019 that 1,400 companies had been breached by nation states, using building control devices as the top three points of entry. With all the devices within modern facilities that are connected to the internet, focus on security must be paramount.

In mitigating the potential impact of cybercrime within their companies (or clients), today's facilities managers should:
- Ensure that they take overall coordination responsibility between external suppliers and their companies or clients
- Accept responsibility for cybersecurity as part of installing or servicing equipment and systems
- Insist that suppliers supply risk assessments and mitigation efforts with regard to cybersecurity, as well as detailed specifications of systems to be installed

By doing the above, facilities managers can just through their signalling and without any cost to the companies or clients, indicate that this is something that they take seriously and must for part of any supplier's offering or engagement.

With cyber risk gaining heightened visibility, building managers need to prioritize cybersecurity in their technology selection process. In the Verdantix 2019 global corporate survey, 88% of respondents noted improving cybersecurity for building operational systems as a priority over the next 12 months. In the 2019 global real estate asset manager survey, 54% of respondents rated cybersecurity risks as either a very significant or significant source of risk for their clients' portfolios over the next five years.

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HOW CAN CLEVERLY HELP WITH DIGITAL TRANSFORMATION

Cleverly sits at the centre of the supplier/customer relationship by providing suppliers with the solutions to allow them to deliver for even the most demanding customers. For their customers, we provide them with means of measurement and a plug and play platform to better manage their facilities and operating processes.

Cleverly provides a platform that can be expanded by clients to meet even the most complex requirements. Whether it is your first foray into the world of CAFM or you are looking for software to support your Industry 4.0 solutions, Cleverly can help.

The platform provides you with leading edge technologies that allow you to focus on delivering for your clients. This includes workflow automation, sensor integrations, built-in communication channels, resource booking, compliance, invoicing and reconciliation, asset management and more.

Get in touch to see how Cleverly can help you in your digital transformation.

E: contact@cleverly.works

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