Challenges in the Current State of Information Delivery in Facility Management

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Abstract: In the ever-evolving landscape of facility management (FM), efficient information delivery and management are crucial for driving innovation and operational success. This article examines the current state of information delivery within the FM sector, highlighting the multifaceted challenges it faces. As FM increasingly adopts digital infrastructure, streamlining information processes becomes essential for enhancing operational effectiveness and strategic decision-making. The research methodology involves a comprehensive literature review and semi-structured interviews with various FM professionals, analysed using content analysis to identify existing gaps in information delivery systems and explore innovative solutions being implemented across the industry. Key challenges identified include integrating internet of things (IoT) devices and smart technologies into legacy systems, which often leads to issues with data security, privacy and interoperability. Information overload is another critical challenge as FM professionals struggle to sift through vast amounts of data to extract actionable insights. Additionally, the article discusses cultural and organisational barriers to adopting new technologies in FM, such as resistance to change and a lack of skilled personnel. The main findings from the interview sessions reveal that data security, interoperability and information overload are significant concerns, while there is optimism about the potential of building information modelling (BIM) and other emerging technologies to address these issues. Despite the challenges, integrating BIM provides substantial opportunities to optimise information delivery in FM. By embracing innovative solutions and fostering a culture of continuous learning and adaptation, FM professionals can significantly improve the efficiency and effectiveness of their operations.

Keywords: Information delivery, Facility management, Digital technologies in FM, Information management issues, Building information modelling (BIM)

INTRODUCTION

Facility management (FM) is a critical discipline that ensures the smooth operation and maintenance of various facilities, ranging from commercial buildings to industrial complexes (Atkin and Brooks, 2021). In recent years, the FM sector has undergone significant transformations driven by technological advancements and the growing need for more efficient and

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effective management practices (Oluleye et al., 2023). As facilities become increasingly complex, the volume and complexity of information that FM professionals must handle have grown exponentially. This rapid evolution underscores the importance of robust information delivery systems that can support the myriad tasks and decisions required to maintain and enhance facility performance (Wijekoon, Manewa and Ross, 2020).

The current landscape of FM is characterised by a push towards digitalisation, with technologies such as the internet of things (IoT), smart technologies and building information modelling (BIM) playing pivotal roles (Oluleye et al., 2023). These technologies promise to streamline operations, reduce costs and improve overall service delivery. However, integrating these advanced systems into existing legacy infrastructure presents significant challenges. Issues such as data security, privacy and interoperability are critical concerns that need to be addressed to fully leverage the potential of these innovations (Azmi, Ismail and Rosman, 2023).

Furthermore, FM professionals are often overwhelmed by the sheer volume of data generated by these technologies (Matarneh et al., 2019). The ability to filter, analyse and derive actionable insights from this data is essential for making informed decisions and optimising facility operations (McArthur and Bortoluzzi, 2018). Yet, the industry faces several barriers, including cultural resistance to change, a shortage of skilled personnel and organisational inertia, which hinder the adoption and effective use of new technologies (Al-Kasasbeh, Abudayyeh and Liu, 2021).

This article aims to provide a comprehensive examination of the current state of information delivery in the FM sector. Through an extensive literature review and interviews with industry professionals, the study identifies key challenges and explores innovative solutions being implemented across the industry. The focus is on how BIM technologies can be integrated to enhance the efficiency of maintenance operations and FM. By addressing these challenges and embracing innovative solutions, FM professionals can significantly improve the efficiency and effectiveness of their operations, paving the way for a more dynamic and responsive FM sector.

LITERATURE REVIEW

The Evolution of Facility Management

FM has evolved significantly from its early beginnings, which focused mainly on the construction and maintenance of essential structures like temples and public buildings (Babinskė and Apanavičienė, 2020). The Industrial Revolution expanded FM's scope as the rise of factories and urban areas created a need

for more systematic building management (Siccardi and Villa, 2023). By the mid-20th century, FM began to formalise as a profession with dedicated facility managers and the establishment of professional organisations like the International Facility Management Association (IFMA) in 1980 (Eglite and Tsapenko, 2015).

The transition from traditional to digital FM practices began in the late 20th century with the introduction of computerised maintenance management systems (CMMS) (Shaheen and Németh, 2022). These systems automated maintenance tasks, tracked work orders and managed inventories, significantly improving efficiency. The integration of IoT devices and smart technologies further transformed FM, enabling real-time monitoring and control of building systems (Aloisio, 2018). Furthermore, BIM also emerged as a crucial tool, offering digital representations of buildings that enhance collaboration and asset management (Ghaffarianhoseini et al., 2017).

Technological advancements have profoundly impacted FM, shifting it from a reactive to a proactive discipline. Automation and digital tools have streamlined processes, allowing facility managers to focus on strategic activities. Data-driven decision-making, powered by AI and machine learning, enables predictive maintenance and energy optimisation, enhancing building performance and sustainability (Ahmad et al., 2022). Additionally, digital platforms and BIM have improved collaboration among stakeholders, leading to better project outcomes and more efficient facilities (Ghaffarianhoseini et al., 2017).

Digital Infrastructure in Facility Management

FM is undergoing a profound transformation driven by the adoption of advanced digital technologies. These innovations, including the IoT, smart technologies and BIM, are redefining traditional practices and enabling more efficient, data-driven and proactive management of facilities. These technologies collectively contribute to the enhancement of operational efficiency, data-driven decision-making, cost savings and sustainability within the FM sector (Hosseini et al., 2018; Pishdad-Bozorgi et al., 2018; Mannino, Dejaco and Re Cecconi, 2021).

The IoT involves a network of interconnected devices that gather and exchange data in real-time. In FM, IoT devices such as sensors and smart meters play a crucial role in monitoring parameters like temperature, humidity, energy consumption and occupancy levels (Dahanayake and Sumanarathna, 2022). This real-time data collection facilitates predictive maintenance, energy optimisation and enhanced occupant comfort, allowing facility managers to respond swiftly to changes and potential issues, thereby, ensuring smooth and efficient operations (Altohami et al., 2021). Smart technologies encompass a

range of innovations aimed at automating and optimising building operations, including smart lighting, heating, ventilation and air-conditioning systems and automated security systems (Li et al., 2019; Evjen et al., 2020). These systems use intelligent algorithms and connectivity to adjust to changing conditions, improving operational efficiency and reducing costs (Wong and Yip, 2023).

Building information modelling (BIM) involves creating a digital representation of a facility's physical and functional characteristics. This comprehensive model includes detailed information about the building's components, systems and processes, providing a single source of truth for all stakeholders (Carbonari, Stravoravdis and Gausden, 2018; Ariffin, Mustafa and Sapri, 2021). Moreover, BIM enhances planning, design, construction and FM by improving collaboration, accuracy and efficiency throughout the building lifecycle. The ability to visualise and simulate different scenarios supports better planning and resource management, leading to more effective decision-making (Farghaly et al., 2019; Deng, Menassa and Kamat, 2021; Pinti, Codinhoto and Bonelli, 2022).

The integration of these digital technologies in FM brings numerous benefits, including improved operational efficiency, enhanced data-driven decision-making, cost savings and sustainability. Automation of routine tasks and real-time monitoring through IoT and smart technologies reduces the need for manual intervention, allowing FM professionals to focus on strategic activities (Ji et al., 2019). Digital tools enable the analysis of vast amounts of data to identify trends, predict potential issues and implement preventive measures (Love et al., 2014). Cost savings result from optimised energy usage, reduced maintenance costs and improved resource allocation (Chahrour et al., 2021), while digital technologies promote sustainability by optimising energy usage and minimising waste, aligning with regulatory and societal demands for greener building practices (Krämer and Besenyoi, 2018; Edirisinghe and Woo, 2021). Several case studies, such as The Edge in Amsterdam and the Sydney Opera House, highlight the successful implementation of these technologies, showcasing their tangible benefits (Sanchez, Hampson and Mohamed, 2015; Chaudhari et al., 2024).

Challenges in Information Delivery in Facility Management

As FM increasingly integrates digital technologies to improve operational efficiency and decision-making, several significant challenges in information delivery have emerged (Araszkiewicz, 2017). These challenges include data security and privacy concerns, interoperability issues with legacy systems and the difficulties associated with managing and extracting insights from large volumes of information (Ahmed et al., 2017). In summary, the key challenges affecting information delivery in FM are captured in Table 1.

Table 1. Summary of challenges in information delivery in FM

Aspect	Description	Source
Data security and privacy concerns	Ensuring the security and privacy of data collected by FM systems, which includes sensitive information, is a foremost challenge.	Matarneh et al. (2019); Dahanayake and Sumanarathna (2022)
Interoperability issues with legacy systems	Many FM organisations rely on a mix of old and new technologies, resulting in significant interoperability challenges.	Tsang (2002); Farghaly et al. (2018); Motamedi, Iordanova and Forgues (2018); Terreno, Asadi and Anumba (2019); Jaskula et al. (2024); Lovell, Davies and Hunt (2024)
Information overload and data management difficulties	The proliferation of digital tools and IoT devices in FM has led to an overwhelming amount of data being generated, making management and extraction of actionable information challenging.	Su, Lee and Lin (2011); Aloisio (2018); Dixit et al. (2019); Terreno, Asadi and Anumba (2019); Konanahalli, Marinelli and Oyedele (2022)

Addressing these challenges is critical for realising the full potential of digital transformation in FM:

1. Data security and privacy concerns: One of the foremost challenges in the digitalisation of FM is ensuring the security and privacy of data. The FM systems collect and process a vast amount of sensitive information, including occupancy patterns, energy consumption and maintenance schedules (Dahanayake and Sumanarathna, 2022). This data, if not adequately protected, can be vulnerable to cyberattacks, data breaches and unauthorised access. The increasing use of IoT devices, which often have varying levels of security, exacerbates these concerns. Ensuring robust data encryption, secure communication channels and comprehensive cybersecurity protocols are essential to protect sensitive information (Matarneh et al., 2019).
2. Interoperability issues with legacy systems: Many FM organisations rely on a mix of old and new technologies, resulting in significant interoperability challenges (Motamedi, Iordanova and Forgues, 2018). Legacy systems, which were not designed to integrate with modern digital tools, can hinder the seamless flow of information and the efficient operation of facilities (Tsang, 2002). These systems often use outdated protocols and data formats that are incompatible with newer technologies, creating data silos and complicating data exchange (Jaskula et al., 2024). Overcoming these interoperability issues requires substantial investments in upgrading or replacing

legacy systems, implementing middleware solutions and adopting standardised data formats (Farghaly et al., 2018; Lovell, Davies and Hunt, 2024). However, the financial and logistical implications of these changes can be daunting for many FM organisations (Terreno, Asadi and Anumba, 2019).

3. Information overload and data management difficulties: The proliferation of digital tools and IoT devices in FM has led to an overwhelming amount of data being generated (Aloisio, 2018). While this data holds valuable insights, managing and extracting actionable information from such vast datasets is a considerable challenge. The FM professionals must sift through large volumes of data to identify relevant information, which can be time-consuming and resource-intensive (Konanahalli, Marinelli and Oyedele, 2022). Furthermore, the lack of effective data management practices can result in data redundancy, inconsistency and inaccuracy (Terreno, Asadi and Anumba, 2019). To address these issues, FM organisations need to implement robust data management strategies, including data governance frameworks, advanced analytics tools and machine learning algorithms that can automate data processing and analysis (Su, Lee and Lin, 2011; Konanahalli, Marinelli and Oyedele, 2022). These solutions can help FM professionals focus on critical insights and make informed decisions, ultimately enhancing the efficiency and effectiveness of facility operations (Dixit et al., 2019).

Integration of Building Information Modelling in Facility Management

The integration of BIM into FM is transforming the way facilities are designed, built and maintained. The BIM provides a comprehensive digital representation of a building's physical and functional characteristics, facilitating collaboration among stakeholders throughout the building's lifecycle (Jamil and Fathi, 2018; Farghaly et al., 2019). This technology enables the creation of detailed 3D models that integrate architectural, structural and mechanical, electrical and plumbing (MEP) elements, using software such as Autodesk Revit, Bentley Systems and Graphisoft ArchiCAD (Amoah and Nguyen, 2019). By providing a unified platform for information sharing and coordination, BIM significantly enhances the efficiency and effectiveness of facility operations (Lewis, Smith and Whittaker, 2018).

The BIM extends beyond 3D modelling to include 4D (time) and 5D (cost) dimensions, which allow for comprehensive project scheduling and cost estimation (Smith, 2014). This multi-dimensional approach improves project planning, reduces errors and enhances efficiency throughout the construction and operational phases. The adoption of BIM in FM offers numerous benefits, including better maintenance planning, cost savings and

improved collaboration among stakeholders (Hu et al., 2018). Case studies of successful BIM integration in FM highlight its transformative potential and tangible benefits.

The Sydney Opera House is a prime example of successful BIM implementation in FM. The BIM model for this iconic structure includes detailed information about its architectural features, structural elements and mechanical systems, allowing FM professionals to plan and execute maintenance activities efficiently (Schevers et al., 2007; Sanchez, Hampson and Mohamed, 2015). Similarly, Penn State University uses BIM to manage its extensive campus facilities, maintaining accurate records of building systems, tracking maintenance activities and planning renovations. This has led to improved maintenance efficiency, reduced operational costs and enhanced overall management of the campus infrastructure (Matarneh et al., 2020; Ghorbani and Dubler, 2023).

Other notable examples include the University of Southern California's School of Cinematic Arts, which has integrated BIM from the design stage through to FM, significantly enhancing maintenance efficiency and space management (Cavka, Staub-French and Poirier, 2017). Heathrow Terminal 5 in London has also adopted BIM to manage its complex infrastructure, enabling real-time monitoring and proactive maintenance of various systems (NBS, 2018). These case studies demonstrate how BIM can revolutionise FM practices by providing a robust framework for managing and maintaining building operations efficiently.

Barriers to Technology Adoption in Facility Management

The adoption of advanced technologies in FM promises significant improvements in efficiency, cost savings and operational effectiveness. However, several barriers hinder their widespread adoption. One of the most significant barriers is cultural and organisational resistance to change. Established practices and workflows create a comfort zone for employees and introducing new technologies can disrupt these routines. Resistance often stems from fear of the unknown, concerns about job security and a lack of understanding of the benefits that new technologies can bring (Jamil and Fathi, 2017; Araszkiewicz, 2017; Konanahalli, Marinelli and Oyedele, 2022; Lovell, Davies and Hunt, 2024).

Organisational inertia also plays a role, where decisionmakers may be reluctant to alter existing processes and systems due to perceived risks and the comfort of sticking with familiar methods (Sarkar and Osiyevskyy, 2018). Overcoming this resistance requires effective change management strategies, including clear communication of the benefits of new technologies, involving stakeholders in the decision-making process and providing support and training to ease the transition (Long and Spurlock, 2008).

Another major barrier is the skills gap within the FM workforce. Many FM professionals lack experience with digital tools, data analytics and advanced maintenance systems, making it challenging to integrate these technologies effectively (Mong, Mohamed and Misnan, 2019; Durdyev et al., 2022; Azmi, Ismail and Rosman, 2023). To address this, organisations need to invest in training and development programmes that equip employees with the required skills. This can include formal education, workshops and on-the-job training. Partnering with educational institutions and industry associations can help bridge the skill gap by creating tailored programmes that align with the evolving needs of the FM industry (Low, Gao and Ng, 2021).

Financial constraints are another significant barrier. Implementing advanced technologies often requires substantial upfront investment in hardware, software and infrastructure (Ajayi, 2022; Wong and Yip, 2023). Ongoing costs for maintenance, upgrades and training can further strain budgets, particularly for smaller FM operations. Integrating new technologies into existing systems can be complex, requiring careful planning, coordination and execution (Farghaly et al., 2018; Matarneh et al., 2018). To overcome these financial and logistical challenges, organisations can explore strategies such as phased implementation, leveraging government grants and incentives and seeking partnerships with technology providers to share costs and risks. A well-defined implementation plan that includes pilot projects and incremental rollouts can help manage the complexities and minimise disruptions. By addressing these barriers through effective change management, workforce development and strategic financial planning, FM organisations can fully realise the benefits of technological advancements (Chin et al., 2018; Azmi, Ismail and Rosman, 2023). Table 2 presents a summary of the Barriers to technology adoption in FM.

Table 2. Barriers to technology adoption in FM

Aspect	Description	Source
Cultural and organisational resistance	Resistance to change due to established practices and workflows, fear of the unknown, job security concerns and lack of understanding of new technologies.	Long and Spurlock (2008); Sarkar and Osiyevskyy (2018)
Skills gap	Many FM professionals lack experience with digital tools, data analytics and advanced maintenance systems, making integration challenging. Training and development programmes are needed.	Mong, Mohamed and Misnan (2019); Low, Gao and Ng (2021); Durdyev et al. (2022); Azmi, Ismail and Rosman (2023)

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Table 2 *Continued*

Aspect	Description	Source
Financial constraints	Implementing advanced technologies requires substantial upfront investment in hardware, software and infrastructure, with ongoing costs for maintenance, upgrades and training.	Chin et al. (2018); Farghaly et al. (2018); Matarneh et al. (2018); Ajayi (2022); Azmi, Ismail and Rosman (2023); Wong and Yip (2023)

METHODOLOGY

This research employed a qualitative method using semi-structured interviews to gather in-depth information on the current state of information delivery within the FM sector and to highlight the multifaceted challenges it faces. Five facility managers were interviewed, in line with the recommendations of Klassen et al. (2012) and Zakaria, Ismail and Yusof (2013), who suggest that between 5 and 25 interviews are adequate for a phenomenological study aimed at understanding the roles and experiences of individuals as social actors. The interviews, conducted via Google Meet, lasted between 1 hour to 2 hours and focused on the current state of information delivery and its associated challenges in the FM sector. This method ensured that interviewees provided detailed insights into their experiences and perspectives. The interview data were analysed using content analysis, which involved transcribing the interviews verbatim and systematically coding the data to identify recurring themes and patterns using ATLAS.Ti version 24 software (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany). The respondents were selected based on their expertise and experience in the FM sector, ensuring that they could provide valuable insights into the challenges and opportunities in information delivery. The details of the respondents are presented in Table 3.

Table 3. Respondent information

Respondent ID	Position	Years of Experience
R1	Facility manager	15
R2	Facility manager	10
R3	FM consultant	8
R4	Facility manager	20
R5	FM consultant	12

ANALYSIS AND DISCUSSION

This section analyses the current state of information delivery in FM, focusing on the key challenges and innovative solutions identified through a comprehensive literature review and qualitative interviews with FM professionals. The discussion is organised around three main themes: integration challenges, information overload and cultural barriers, followed by an exploration of innovative solutions like BIM and predictive analytics.

The research reveals several key findings regarding information delivery in FM. The primary challenges identified include the integration of IoT devices and smart technologies into existing systems, which often leads to issues with data security, privacy and interoperability. Information overload is another critical issue, as FM professionals struggle to manage and interpret vast amounts of data effectively. Additionally, cultural and organisational barriers, such as resistance to change and a lack of skilled personnel, hinder the adoption of new technologies.

Despite these challenges, the research also highlights significant opportunities for improving information delivery in FM. Innovative solutions such as BIM have been successfully implemented in various organisations. These technologies offer substantial benefits, including enhanced accuracy in building documentation, improved collaboration among stakeholders and proactive maintenance planning. The implementation of these solutions has resulted in increased operational efficiency and cost savings, demonstrating their potential to transform FM practices.

Analysis of Key Challenges

Integration of Internet of Things devices and smart technologies

The integration of IoT devices and smart technologies into existing FM systems is fraught with difficulties. Interviewees frequently mentioned issues related to data security, privacy and interoperability. Respondent R1 highlighted that integrating new IoT devices with their old systems often leads to compatibility issues and potential security vulnerabilities. Meanwhile, R2 added that their computer maintenance management system (CCMS) was not designed to handle the kind of data generated by modern IoT devices, making integration a significant challenge. The literature corroborates these challenges, emphasising the need for robust cybersecurity measures and standardised protocols for data exchange (Motamedi, Iordanova and Forgues, 2018). For instance, a study by Ghaffarianhoseini et al. (2017) highlights that integrating IoT in FM can expose systems to cyber threats, necessitating robust security frameworks. Additionally, Brous, Janssen and Herder (2020) found that

interoperability issues often stem from the lack of standardisation in IoT implementations, which can lead to significant data management challenges.

Information overload

Information overload is a critical challenge in FM, with professionals struggling to manage and interpret vast amounts of data. Respondents R2 and R4 explained that they have so much data coming in from various sources that it is difficult to filter out what is important and make timely decisions. Furthermore, R1 and R5 noted that the volume of data can be overwhelming and without proper tools, it is almost impossible to extract meaningful insights. This aligns with findings in Konanahalli, Marinelli and Oyedele (2022) that stress the need for advanced data analytics tools to help sift through and prioritise information, enabling more actionable insights. Research by Xu, Xu and Li (2018) support this, showing that advanced analytics and AI can significantly reduce the burden of data processing by automating the identification of key insights. Moreover, a case study by Zhang et al. (2013) demonstrated that implementing data analytics tools in FM operations improved decision-making speed and accuracy by 30%.

Cultural and organisational barriers

Resistance to change and a lack of skilled personnel are significant barriers to adopting new technologies in FM. Many interviewees cited organisational inertia and a reluctance to invest in training as major obstacles. Next, R2, R3 and R4 shared that there is a lot of pushbacks when they try to introduce new technologies, mainly because people are set in their ways and do not see the immediate benefits. Meanwhile, R1 and R5 mentioned that they need more training programmes to bridge the skill gap, but there is resistance to allocate more resources for this purpose. This is echoed in the literature, which highlights the importance of fostering a culture of continuous learning and providing adequate training to ensure successful technology adoption (Sarkar and Osiyevskyy, 2018). Kotter's (2009) model for organisational change also emphasises the importance of leadership in driving change and the need for a structured approach to managing resistance. A study by Pinti, Codinhoto and Bonelli (2022) found that organisations that invested in continuous professional development saw a 40% increase in technology adoption rates, underscoring the importance of training and development.

Analysis of Innovative Solutions

Building information modelling

BIM is emerging as a powerful tool for improving information delivery in FM. A government building demonstrated that implementing BIM resulted in significant cost savings and operational efficiencies. Respondents R1, R2 and R3 from the facility stated that BIM has transformed their approach to FM by providing a comprehensive, real-time view of the building systems, which helps them plan maintenance more effectively and avoid costly mistakes. Furthermore, R4 and R5 noted the collaborative platform provided by BIM has improved communication and coordination among all stakeholders. Gao and Pishdad-Bozorgi (2019) supports these findings, showing that BIM enhances collaboration and decision-making across the lifecycle of a facility. Moreover, a study by Barlish and Sullivan (2012) highlighted that BIM implementation in FM reduced maintenance costs by up to 15% and increased asset utilisation efficiency. Carbonari, Stravoravdis and Gausden (2018) pointed out that BIM can significantly improve lifecycle management by integrating data from various sources, leading to more effective and informed decision-making.

Other emerging technologies

Emerging technologies such as artificial intelligence (AI), augmented reality (AR), virtual reality (VR) and blockchain have the potential to further revolutionise FM (Mannino, Dejaco and Re Cecconi, 2021). For example, AI can enhance predictive analytics, AR and VR offer immersive training and maintenance simulations, while blockchain can improve data security and transparency. All of the respondents were optimistic about these technologies, although they noted that widespread adoption is still in the early stages. Meanwhile, R4 remarked that AI has the potential to revolutionise predictive maintenance, but they are still not implementing those technologies. Furthermore, R2 and R5 noted that AR and VR are exciting technologies, especially for training purposes, but they need to see more real-world applications to understand their full potential. Kane et al. (2022) demonstrated that AI could reduce maintenance costs by predicting equipment failures before they occur, while Kaplan et al. (2020) found that AR and VR applications significantly improved training outcomes by providing realistic simulations. Additionally, Zheng et al. (2020) showed that blockchain could enhance data integrity and transparency in FM by providing a secure and immutable record of transactions and data exchanges.

The findings from the literature review and interviews reveal a consistent picture that while FM faces significant challenges in integrating new technologies and managing information, there are substantial opportunities to enhance

efficiency and effectiveness through innovative solutions. The theoretical insights are largely corroborated by practical experiences, although some discrepancies, such as the varying levels of technology adoption, highlight the need for tailored strategies in different organisational contexts.

For FM professionals, the findings suggest several actionable strategies. To overcome integration challenges, investing in robust cybersecurity measures and standardised data protocols is essential. Addressing information overload requires the adoption of advanced data analytics tools. Overcoming cultural barriers necessitates fostering a culture of continuous learning and providing comprehensive training programmes. Embracing innovative solutions like BIM can significantly enhance operational efficiency and decision-making capabilities.

Future research should explore the long-term impacts of integrating advanced technologies in FM, particularly focusing on AI, AR, VR and BIM. Additionally, more case studies on the successful implementation of these technologies across various sectors would provide valuable insights. Research on strategies to overcome organisational resistance and promote technology adoption in FM is also needed.

Therefore, while the FM industry faces several challenges in optimising information delivery, there are significant opportunities to overcome these obstacles through the integration of innovative technologies. Improved information management can enhance strategic decision-making and operational effectiveness, leading to more efficient and effective FM practices. By addressing the identified challenges and leveraging emerging solutions, FM professionals can drive substantial improvements in their operations.

CONCLUSION

Efficient information delivery is crucial in FM as it directly affects operational efficiency, decision-making and overall effectiveness. FM generates vast amounts of data daily from sources such as building systems, IoT devices, maintenance records and occupant feedback. Timely and accurate information delivery ensures that facility managers can make informed decisions, respond promptly to issues and optimise resource allocation. This leads to streamlined operations, reduced downtime and enhanced productivity. Additionally, it improves communication and coordination among stakeholders, including facility managers, service providers and building occupants, resulting in better service quality and satisfaction.

The current state of information delivery systems in FM is a mix of traditional and advanced digital practices. Many organisations use digital tools like CMMS and integrated Workplace Management Systems to manage information delivery.

These systems offer centralised platforms for data collection, storage and analysis, facilitating efficient information flow. However, challenges remain in integrating disparate systems and ensuring data interoperability. Legacy systems often struggle to communicate with newer technologies, leading to information silos and inefficiencies. Moreover, the sheer volume of data can overwhelm facility managers, making it difficult to extract actionable insights without advanced data analytics tools. Despite these challenges, the trend towards digital transformation in FM is accelerating.

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