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2024

Fit for BIM?

People + Business

25 - 26 July @ University of Pretoria

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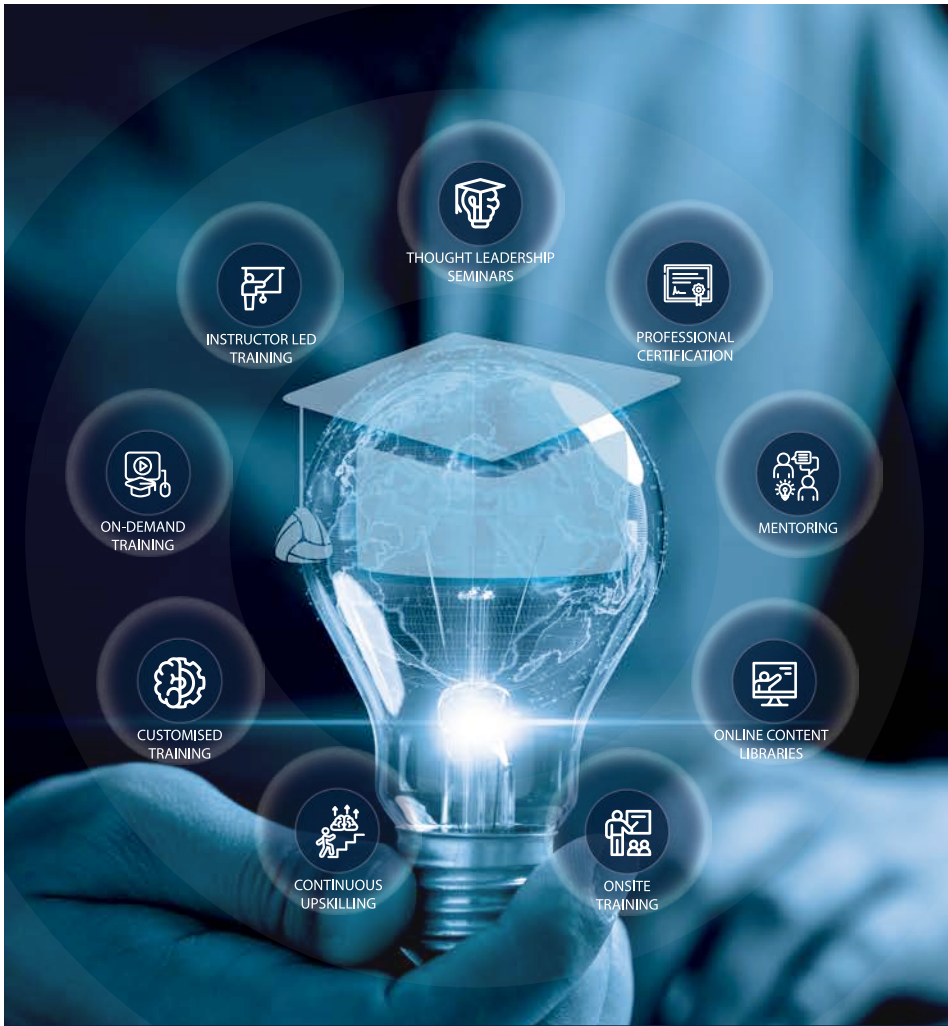


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BIMCommunity Africa and Department of Architecture, University of Pretoria

25, 26 July 2024

Dear Participants,

We are thrilled to welcome you to the Building Information Modeling (BIM) Harambee 2024, a pivotal event that marks a new era of sustainable construction and infrastructure development in South Africa.

As we stand on the brink of a demographic wave that will see Sub-Saharan Africa's population double in the next 25 years, the need for smarter, faster, and more sustainable building practices has never been more pressing. While Africa will see the biggest growth in urbanization and built environment trends

By 2050, with Sub-Sahara Africa's built environment is expected to double, with over 70% of construction yet to occur (Deloitte, 2020; Intergovernmental Panel on Climate Change, 2022; UN-Habitat, 2020). This rapid growth offers both obstacles and prospects for sustainable progress in the face of climate change, long-term socio-economic sustainability, and many other related challenges. African buildings alone contribute to 61% of Africa's final energy consumption and 32% of CO2 emissions (UNEP et al., 2020). Therefore, the expected doubling of urban stock and infrastructure by 2050 calls for innovative development, construction, and design tailored to Africa's current and future needs. To meet this demand will require a transformative change in the 21st century African built environment industry.

Additionally, the African digital economy projected to hit \$712 billion by 2050 (International Finance Corporation, 2020). In sub-Sahara alone, over 230 million jobs will require digital skills by 2030, resulting in almost 650 million training opportunities (World Bank, 2021). The burgeoning African digital economy will also have major impacts in the African built environment sector. This sector, encompassing construction, urban planning, and infrastructure



development, is increasingly reliant on digital technology for design, simulation, and management. As such, professionals in this field will need to be proficient in digital tools, methodologies, and skills to drive innovation and efficiency.

The African Union's Digital Transformation Strategy is poised to significantly influence the built environment sector by fostering an integrated and inclusive digital society (African Union, 2020). It emphasizes the creation of a harmonized regulatory framework to facilitate investment and financing, aiming to close the digital infrastructure gap. This strategy is expected to catalyze innovative growth, ensuring that digital advancements benefit the entire continent, from urban planning to construction, and beyond.

The current supply of digital skills in Africa is insufficient to meet the socio-economic and infrastructure demands of 2050 (World Bank, 2021). This is particularly true for the African built environment sector (Deloitte, 2020; UNEP et al., 2020). Therefore, equipping Africa's workforce with relevant digital competencies is crucial for fostering innovation and economic expansion across the continent. Moreover, the integration of digital skills across various industries is vital for enhancing productivity and addressing issues such as climate change and urban growth. As the African digital economy advances, professionals in the built environment equipped with digital expertise will be instrumental in developing future-fit African cities.

Our youth, representing an ever-growing portion of the global workforce, are the future city-makers and the guardians of our environment.

BIM Harambee 2024 is not just an event; it's a movement towards embracing innovative technologies and methodologies that will lead us to build for tomorrow, today. We are committed to fostering education and skill development to ensure that our workforce is equipped to meet the challenges and opportunities that lie ahead.

Join us in this journey to reshape the landscape of African cities and infrastructure, to create a legacy that we can be proud of. We hope you enjoy this conference with us!

Warm regards,

BIMCommunity Africa



Construction plays a vital role in South Africa's economic and social development and serves as a large-scale employer. It provides the physical infrastructure that makes up the backbone of our country's economic activity.

Our vision

Our mission is a transformed construction industry that is inclusive, ethical and contributes to a prosperous South Africa and the world.

Our value

Together we can build a South African construction industry that serves continued social and economic growth, while delivering projects at globally competitive standards.

BRICS Future Skills Challenge

CIDB's Centres of Excellence coordinate participation in the BRICS Future Skills Challenge which aims to create a pipeline of skills for emerging jobs. Benchmarked through collaborative partnerships, the Future Skills focus on, among others, Digital Twin, Building Information Modelling, Internet of Things, and Drone Technology.

TVET College Partnerships

CIDB has partnered with TVET Colleges to support their participation in WorldSkills International Competitions. WorldSkills brings together stakeholders from industry, government and educational institutions to set the standard and improve the quality of education through competitions. Plans are underway to extend this partnership to Future Skills.

WELCOME TO BIM HARAMBEE 2024!

We're thrilled to have you here. This conference is all about collaboration and learning together. Don't hesitate to ask questions, as there are no wrong or silly ones. Let's make the most of this event and enjoy ourselves.



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DAY 1: THURSDAY, 25 JULY, 2024

THEME	TIME	FORMAT	TOPIC
07:30			
The BIM Project Workstages	09:00	Introduction	Welcome Owner FM perspective
	09:20	Tag Team panel presentation	
BREAK 10:50			
The people of BIM	11:15	Introduction	Career paths in BIM
	11:30	Presentation	Unlocking Potential - the power of instructor-led training
	12:00	Panel Discussion	BIM Team Organogram - roles and responsibilities
BREAK 13:00			
The people of BIM	13:20	Panel Discussion	How do we get our people BIM Fit?
	13:20	Panel Discussion	Brics BIM Challenge and the Role of the CIDB
	15:00	Close	WHAT TO EXPECT ON DAY 2
15:10			

OUTLINE

SPEAKERS

REGISTRATION OPENS

Set the scene for a collaborative BIM Project for Boukunde, Dept of Architecture building.

Calayde Davey

How do teams collaborate across the 9 workspaces? Who does what, how, and what is the role of the information?

Tag Team - Richard Matchett, Calayde Davey, Machiel Odendaal, Wilam Labuschagne, Louis de Klerk, Claudio Duarte, Willem Viviers, Nathan York, Jaco Barnard, Suvaniya Pillay

BREAK

Introduction to BIM careers, roles and responsibilities

Calayde Davey

Instructor-Led training, unlike its self-paced counterparts, offers a more high-touch approach to learning. Learning is more than the dissemination of information, its about an interactive environment that engages participants that would benefit from seasoned certified instructors with the real world insights.

Jo-Ann Steyn
Xavier Modena

The responsibilities of each role, and the hard and soft skills required. How do these roles integrate into the large BIM Team? What is the BIM Career Path?

Richard Matchett, Elna van der Merwe, Gary Mansfield, Anien Nauta, Marius Bierman, Calayde Davey, AMBrose Chikukwa.
Facilitator: Amanda Filtane

BREAK

The BIM revolution in the construction industry has not created a shortage of jobs, but a shortage of skills. What does upskilling and training look like in the short, medium and long term?

Richard Matchett, Elna van der Merwe, Gary Mansfield, Anien Nauta, Marius Bierman, Calayde Davey, AMBrose Chikukwa.
Facilitator: Amanda Filtane

The session will focus on cidb BIM-related planned activities, including the entity's involvement in the BRICS Future Skills Challenge.

Pranveer Harriparsadh, Lubabalo Xoko, Nkcubeko Madikazi, Ronaldo Phuriwa
Facilitator: Zama Thusi

Calayde Davey

DAY 1 CLOSES

DAY 2: FRIDAY, 26 JULY, 2024

THEME	TIME	FORMAT	TOPIC
07:30			
The business of BIM	09:00	Presentation	The BIM Organisation and Implementation - Project Readiness
	09:45	Presentation	Practical user guide to building a Digital Future for BIM
	10:15	Presentation	The BIM Project (Info/ value workflow)
	10:45	Presentation	Scan to BIM Workflows
BREAK 11:15			
BIM in Action - Business Benefits	11:40	Presentation	Organisational Requirements
	11:50	Panel Discussion	How do you build a BIM Fit Organisation?
BREAK 12:50			

REGISTRATION OPENS

<p>Start on the right foot. People, process and technology - how it lands in your organisation, Are you ready t deliver? Are you organized, have key roles in place and understand how to deliver in a structured manner? Do you have both the capabilities and the capacity to produce the information that will be asked for? Have you mapped out your 'game plan' in workflows, and is you team aligned? Di you have the tools to deliver?</p>	<p>Richard Matchett</p>
<p>Gain a deeper understanding of the challenges and opportunities that come with embracing digital transformation in the built environment. Whether you're an architect, engineer, contractor or industry professional, you will learn how ti create a meaningful digital strategy.</p>	<p>Machiel Odendaal</p>
<p>A BIM workflow leverages Building Information Modeling (BIM) to enhance the design, construction and operation of projects. This process integrates various project phases. BIM aids stakeholders in visualizing budgets, schedules, and resources, tracking changes, and automating administrative tasks. By simulating building components, maintenance activities, and energy efficiency, BIM facilitates lifecycle management, supporting informed decision-making throughout a project's lifespan. BIM boosts the performance and productivity of operations from pre-construction through post0occupancy.</p>	<p>Rob Thane</p>
<p>What are the critical steps to creating a reliable dataset, that is both great to look at and useful for planning, design and verification of your design and construction work? Find out about the skills, processes and tech involved in capturing and modelling existing builds.</p>	<p>Richard Matchett</p>

BREAK

<p>Explore how a proactive organizational culture is vital for successful digital transformation in the built environment. This talk highlights the importance of embracing innovation, fostering digital literacy, and encouraging collaboration to integrate new technologies seamlessly. Learn Key strategies to cultivate a culture that supports and accelerates your digital journey</p>	<p>Calayde Davey and Laetitia Cook</p>
<p>Discover firsthand insights from leading South African digital built environment business on their transformative journey with BIM. Uncover the pivotal skills they acquired and strategic investments they made to successfully integrate BIM into their operations. And becoming BIM Fit.</p>	<p>Thomas Fuller, Richard Matchett, Elna van der Merwe, Gary Mansfield, Anien Nauta, Rob Thane, Marius Bierman, Facilitator: Amanda Filtane</p>

BREAK

DAY 2: FRIDAY, 26 JULY, 2024

THEME	TIME	FORMAT	TOPIC
BIM in Action - Case Studies	13:20	Case Study	Achieving Net Zero with BIM
	14:05	Case Study	City of Cape Town's evolution towards BIM Integration
BREAK		14:50	
BIM in Action - Case Studies	15:10	Presentation	IM and CoDE synergy: A Case Study on evolving traditional BIM practices in bridge modelling
	15:40	Panel Discussion	Q&A for Case Study Presentations
	16:10	Close	CLOSE OUT AND THANKS
		16:15	

OUTLINE

SPEAKERS

“That’s the way we have always done it” doesn’t work anymore. How can we make a building operate better? By looking at project data generated from existing buildings, understanding the dataset and comparing it to other buildings. These outcomes then guide Proper Prior Planning to drive down the time of construction, improve the quality of work at the lowest possible cost and create operational efficiencies in the proposed building that meets tenant demands.

Thomas Fuller

BIM had limited initial adoption across the City of Cape Town (CCT) due to high costs and a lack of trained professionals. The compilation of the National Development Plan (NDP), the Integrated Development Plan (IDP) and the drafting of a CIDB BIM Mandate represented a significant shift with government support for public infrastructure projects, driving broader acceptance. As part of the CCT evolution towards BIM, BIM workshops were held with international partners around defining the CCT BIM Roadmap and Implementation Framework. BIM is integral to CCT’s urban development, aligned with smart city initiatives and sustainable practices.

Melver Govender

BREAK

We explore how the theme of information Modelling is evolving beyond traditional BIM. The integration of Computational Design (CoDE) practices with BIM allows for more efficient and scalable data-driven design practices, Zutari’s CoDE team adopted this philosophy to develop customized tools and integrated data-pipelines to deliver value-added services across large-scale projects. Using a multi-bridge modelling project as a case study, we demonstrate how structured processes accelerated project deliverables and improved the overall efficiency and accuracy during its execution.

Andre Broekman, Astrid van der Laan, James Abrey

Thomas Fuller, Richard Matchett, Elna van der Merwe, Gary Mansfield, Anien Nauta, Rob Thane, Marius Bierman,
Facilitator: Amanda Filtane

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HOW PROPERTY SECTOR ORGANIZATIONS CAN GET 'FIT FOR BIM'

Author: Laetitia van der Merwe

Some organizations are ready to get 'Fit for BIM' while others are simply not. Before we focus on BIM processes, workflows, roles, etc., the organisation itself needs to be ready. You probably know the answer to the question: How many psychologists does it take to change a lightbulb? ... Well, only one but the lightbulb has to want to change.

Will to change?

While "wanting to change" may not be necessary for lightbulbs, it is, unfortunately, necessary for people and organizations. Whether it is a Private Sector Property Development company, Construction company, Architecture firm, Engineering company, Quantity Surveying company, a Property Investment entity, Real Estate Investment Trust (REIT), Pension Fund, Financial Institution, any organisation in the listed Real Estate space, any occupier or tenant of commercial property, and any private company whose staff form members of a Professional Team in the property sector, BIM is meant for all these organizations. But the organisation has to want to get ready for BIM.

Not all organizations want to get ready. In fact, some organizations still believe that BIM is not for them as they have more than 30 years' history of success in the property industry and achieved this without BIM and without digitalisation. These organizations believe that e.g. Excel and perhaps a document repository like Dropbox, is adequate. They may still think of BIM as a 'computer program' or 'a specific piece of software' rather than an integrated digital ecosystem that captures the entire property from its conceptualisation stage, through design and development, construction process, and maintenance stage (thus the full property lifecycle) in a real-time virtual collaborative space.

Organizations such as these, have three things in common:

- Their Management, Executive Team, or Founder members, don't believe that digitalising their work processes will really improve their success, or the level of satisfaction that their clients/customers require.
- They believe they know what's best for the future of their organizations, and that anyone who suggests alternatives, like digitalisation and BIM, are wrong.
- They believe their organizations are 'digital enough' with software packages that don't integrate.

These siloed stacks of freestanding software require continuous manual data input, can't automatically update when changes are made elsewhere in the process/project/system, and can't accumulate enough data to allow for data-driven insights into their work processes, property portfolios, etc. Yet, some organizations truly believe, that, despite the massive improvement that digital technology has brought about in other industries, the property industry will not benefit much. The reason for these beliefs is that people, in general, fear the unknown and become apprehensive when things start changing. In general, change implies learning new things, learning to do things differently, and that requires effort. Much more effort than simply rejecting or denying the need to change. Holding on to the trusted, experienced, ways of the past, suits them better.

A question of mindset

While change is a bit uncomfortable for all of us, people with a **mindset opposed to change** struggle a lot more to adapt to anything new than people with a mindset open to change, an **agile and learning mindset**. The property sector, traditionally a conservative sector with complicated work processes, is no different. Organisational structure and culture contribute to either **expedite or delay** the digitisation decision-making process in built environment organizations, and that includes BIM.

Recent global research confirms “the lack of access to effective data and analytics” as a primary barrier confronting property industry organizations (JLL Global Research, 2022:26). McKinsey Global Institute Industry Digitisation Index indicates that, despite significant digital technology advancements, the property and construction industry has been slow to embrace digitalisation, lagging behind other sectors (Agarwa et al., 2016). In fact, only hunting and agriculture were less digitalised than our sector in 2016. Fortunately, a lot has changed since then.

Organisational structure and culture

Organisation structures vary across a spectrum. On the one side of the spectrum (figure x below) we find the traditional hierarchical structure with deep layers of reporting, a formal chain of command and top-down decision-making. Decision-making is reserved for top management and employees are expected to follow rules and procedures. Opportunities for growth and development are limited. Communication is restricted, involvement is scarce, and the focus is on compliance. Creativity and innovation are stifled by procedures, processes, and red tape.

Somewhere in the middle of the spectrum are the **modern decentralised structures**, e.g. matrix or holacracy models with flatter structures.

Here decisions are made in groups or teams that function on an ad-hoc basis depending on the project. Feedback and suggestions from employees are encouraged through open communication. Employee engagement and motivation is increased as employees are empowered to participate in decision-making (Safont, 2020; Indeed, 2022). Better alignment is achieved between employee and organisational goals. Improved problem-solving, higher job satisfaction, and employee retention are characteristic.

The **Teal model**, on the other end of the spectrum, is even more decentralised. It can be described as a humanistic model with an organisational democracy culture. Communication is open and trust exists throughout the organisation that values diverse perspectives and ideas. Leaders act as facilitators or coaches, encouraging employees to achieve self-actualisation and find meaning in their work (Lee & Edmondson, 2017; Laloux, 2014). Decision-making follows a bottom-up approach, emphasising consensus among employees in transdisciplinary teams (Safont, 2020). Employees foster a sense of ownership, personal fulfilment and accountability. Employees 'live' the organisational vision as it is a vision they share and find personal meaning in, leading to improved creativity, innovation, productivity, efficiency and employee retention.



Whether the psychologist had any success with the lightbulb, or not, psychology does assist us in understanding the impact of mindsets, or cognitive frameworks, on organisational culture during digital transformation. Behavioural Economics and Decision Theory, specifically drawing on Cumulative Prospect Theory informed by psychology, assists in understanding this process. The digitalisation decision process is essential during the organizations' preparation to get 'Fit for BIM'.

Drawing from the perspective of Bounded Rationality Theory, which originates from Simon's definitive work (1982), Tripsas and Gavetti (2000) explain how cognitive frameworks shape organisational culture and managerial decision-making, influencing problem-solving approaches. They indicate that the mental models of reactive organizations are shaped by past experiences rather than being anchored in contemporary or future perspectives, which can hinder effective decision-making.

This phenomenon leads to organisational inertia, defined as the organisation's resistance to internal changes despite significant external shifts. When inertia sets in, the organisation tends to rely on past experiences, resisting change, and becoming less adaptable to new circumstances" (Moradi et al., 2021).

Faced with rapid change and many challenges (e.g. the move to net zero, improvement to net positive buildings, the local energy crisis, ever increasing rates, taxes, utility bills, and OpEx, the inflated interest rate environment, service delivery concerns, pressure on disposable income, etc.) the industry could do with improved work processes, automation and data-driven insight.

The question is, does your organisation want to be proactive or reactive?

Some organizations change only when there is no other option left. When external parties such as clients, customers, and industry regulators start making demands in terms of improved governance, improved space and relationship management, advanced reporting, personalised care, etc., these reactive organizations have to catch-up while their proactive competitors 'are already there'.

While it may be possible to catch up, sometimes other proactive organizations notice a paradigm shift in its early days, seize the opportunity ahead of the curve, gain the competitive edge and leave reactive organizations in its wake. This happens not only to organizations that turn a blind eye to a looming paradigm shift such as the rising tide of digitisation and BIM.

The Polaroid case illustrates how entrenched cultures, bound by rigid cognitive frameworks, impeded adaptation to technological changes despite employee awareness (Tripsas & Gavetti, 2000). Polaroid's traditional hierarchical organisational structure and autocratic leadership created a cognitive barrier resistant to agile adjustments. Despite substantial investments in digital photographic technology research and the development of a superior prototype digital camera by 1992, Polaroid encountered significant competition when they eventually launched their megapixel digital camera in 1996 (when this was the only option left to stay afloat). Unfortunately, the competition was overwhelming and resulted in strategic failure.

How to navigate the digital transformation space

Fortunately, the answers come from within our own industry.

- The JLL global study testifies to the property sector's "extreme reliance on technological infrastructure" (p. 4). Its recommendations include that the property industry should "be building advanced digital platforms" (p. 20), and implementing "Unified ICTs (Information and Communications Technologies)" rather than relying on isolated or siloed sets of software (Puybaraud, 2022:11).
- Another global study, conducted by MRI Real Estate Software and CoreNet Global (MRI Real Estate Software, 2021) amongst real estate organizations from small (1-50 employees) to very large (10,000 or more employees) confirmed that the industry is eager to adopt digital technology solutions. Facing several barriers to adoption, property sector organizations can use this report to overcome these barriers and to benchmark their progress against global industry trends, including AI to improve and automate of workflow processes, etc.
- JLL provides us with sound advice: "Establishing the right solutions and integrating and scaling new technologies across the entire business to maximize impact requires a full process technology implementation roadmap ..." (JLL, 2022:35). The roadmap, summarised briefly, comprises: (1) "Review work and workplace design". This should include reviewing the organisational structure and culture, making the necessary changes and fostering a shared vision for digital transformation. (2) "Establish an understanding of the tech landscape", (3) "Identify future goals", (4) "Review and identify gaps", (5) "Map out integrated technology architecture goals", (6) "Plan the implementation", (7) "Rollout", and (8) "Educate stakeholders" (JLL, 2022:35). Further details for each step are provided in the JLL report (see list of references below).
- In addition, the report provides nine key considerations when selecting digital products, as well as "four critical capabilities to be successful in using technology and innovation to drive their long-term strategy" namely "Strategic Planning, Technology Management, Collective Learning, and Organizational Innovation" (JLL, 2022:32). The latter includes "new managerial models" that tie into and transforming the organisational structure and culture for "Cross-functional collaboration" and "Leadership" (as opposed to management), and lastly, to "Overcome institutional obstacles" (JLL, 2022:32).

- A Harvard Business Review regarding resilience in organizations during times of uncertainty and rapid change, recommends building a Resilience Toolkit that includes new digital routines. Routines represent the behavioural aspects within organizations, specifically referring to employees' daily patterns of behaviour. If employees do not understand and embrace the digitalisation strategy, they are unlikely to readily abandon their existing procedures and routines. The report concludes: "In fact, we believe that the ease with which teams refashion how specific tasks get done – whatever the level of turbulence – is the defining capability of a resilient organization" (Suarez & Montes, 2020, [no pagination]).

THE STEPS AHEAD TO GET 'FIT FOR BIM' (SUMMARY):

Strategy:

- Get the right mindset – flexible, open to change and innovation;
- Shared vision – embrace digital transformation and commitment to new technologies, especially the BIM environment.
- Become a resilient organisation.

Structure:

- Transform to a modern/matrix/holacracy structure (if the Teal model is not yet within reach).

Culture:

- Leaders (not managers).
- Participative decision-making in teams – from bottom to top.
- Emphasis on employee well-being – recognize the value of a motivated and engaged workforce.
- Employees are your most valuable asset! Actively encourage them to share ideas.
- Foster a sense of ownership and commitment among employees, driving innovation and accelerating the implementation of BIM.

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DIGITAL TRANSFORMATION: A SIMPLE GUIDE FOR AECO FIRMS

Transitioning from traditional AECO practices (architecture, engineering, construction, and operations) to digitally integrated environments is not as simple as handing over a Revit license to your IT guy. It's a comprehensive shift in how AECO work is delivered in industry as a whole. It is also a major internal shift in your own firm and practices. Such transformation requires a blend of strong foundational skills in AECO along with a new mix of cold, hot, and warm digital work delivery skills. Transitioning from an analog to a digital built environment organization is a significant step which requires careful planning and consideration so it aligns with your organization's objectives.

It may be helpful to keep these Six Useful Ideas in mind when you start:

Useful Idea 1: Digital transformation is a journey, not a destination.

Transitioning to a digital built environment organization is not as easy as pressing a button. It's a journey that requires planning, care, and consideration. While many see digital transformation as a simply buying fancier computers, it is in reality, a deep transformation in the development of people, their skills, unexplored talents and curiosities. After all, the future of work, including built environment work, is digital for everyone!

Useful Idea 2: Change requires patient learning - for everyone.

Transitions to a digital built environment is not just about adopting new technologies. It's about fundamentally reshaping your organization's operations, self-perception, and engagement with partners. This transformative journey, navigated with thoughtful investment and consideration, can enhance efficiency, promote collaboration, and streamline both internal and external processes and business relationships when implemented effectively. Remember, it's not merely a "change," for your organization, but an evolutionary process involving you and all your business partners over some time. This kind of transformative shift requires patience, and must be carefully cultivated and guided.

Useful Idea 3: Keep transformation incremental and relevant to your organization

Ensure your digital transformation aligns with your organization's unique needs and objectives. Utilize your greatest asset - your internal human talent - by promoting their growth through this transformative journey.

When you discover the hidden talents and interests within your team, align them with internal career goals. You'll find unexpected enthusiasts for this digital journey, eager to grow with you. These champions of digital transformation are instrumental in driving long-term success in your digital organization.

DIGITAL TRANSFORMATION: PEOPLE, PROCESS, TECHNOLOGY

In BIM, we have a saying: *People, Process, Technology*. In that order. Let's unpack each of these in turn.

Useful Idea 4: Invest in People and 21st Century Skills

In the digital transformation journey, it's crucial to prepare and equip your team with the necessary skills to navigate and utilize digital tools effectively. This might involve a series of incremental discovery, training, or workshops sessions tailored to enhance your team's digital literacy. Consider the development of different skill-sets, each playing a unique role in BIM organizations:

1. Cold Skills: Your Technical Foundation

The fundamental technical and BIM abilities that form the bedrock of digital built environment literacy. They include BIM literacy, software proficiency, and understanding of digital tools and information workflows. Often, this requires some kind of training.

2. Hot Skills: Specialists and Leadership Skills

These are advanced, specialized competencies that are highly sought after in the industry. They often involve proficiency in specific software or technology, and may require specialized training or certification. BIM leads also require strong leadership and communication skills to ensure success on projects, not just cold hard tech capability.

3. Warm Skills: Everything in-between

Warm skills serve as the intermediary link between cold and hot skills. They are versatile, adaptable, and crucial for integrating various digital tools and workflows. These skills are key to understanding, communicating, and identifying value conversions among clients, partners, and team members. BIM people have strong communication, teamwork, and problem-solving abilities, and are professionals that can adapt to diverse and fluid roles within a BIM project.

strong communication, teamwork, and problem-solving abilities, and are professionals that can adapt to diverse and fluid roles within a BIM project.

To effectively enhance your team's skill development, start by conducting a comprehensive skill inventory of your organization. This will help you identify existing strengths and areas for improvement. Remember, building a digitally literate team is a key step in the successful digital transformation of your AECO firm. It's not just about adopting new technologies, but about fostering a culture of continuous learning and adaptation in the face of digital evolution.

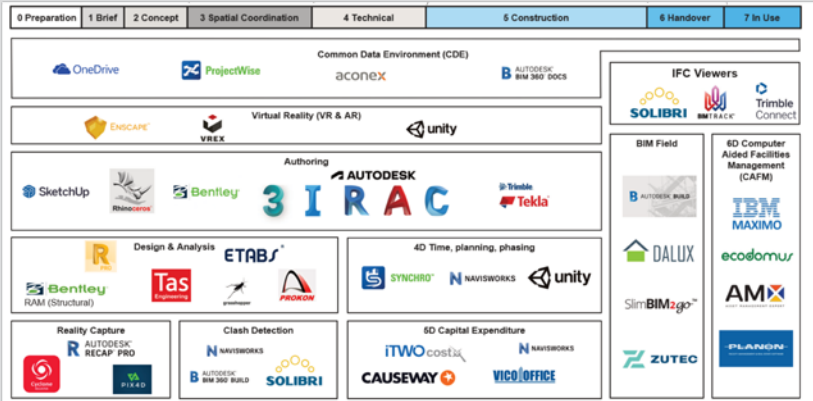
Useful Idea 5: Develop reliable digital delivery processes.

A BIM organization is only successful if it reliably delivers digital information - every time. Successful BIM projects require professional information management. Adopting ISO/SANS 19650 and BS EN 17412 standards enhances BIM by standardizing data generation, classification, security, and exchange. This not only improves decision-making and reduces errors but also optimizes cost, value, and carbon performance. Thus, ISO 19650 alignment is key to sustainable information management in the built environment.

Useful Idea 6: Navigating your unique BIM Technology Ecosystem

Select digital tools that align with your organization's needs, including BIM software, project management platforms, communication tools, and AI instruments. The key isn't just the tool itself, but how it's utilized and the proficiency of the team using it. Engage your team in exploring open and closed BIM software ecosystems, and the range of tools relevant to your organization.

BIM technology develops fast and is a large technology landscape. This can at first, seem a bit intimidating. Take your time to choose those BIM tools relevant to you. Remember, BIM is not just a tool, but a process. A BIM technology ecosystem should facilitate the flow of value and information within the project. Success in BIM projects isn't determined by sophisticated BIM tools, but by the people who effectively use them. Thus, your technology ecosystem should be designed to support the people doing the real BIM work on a daily basis.



THE BIM ORGANIZATION

Figure X. BIM technology options can be a crazy, diverse and every-changing landscape. It takes time to curate the right technology ecosystem for your people, processes and projects.



Complete civil infrastructure design within your existing BIM workflow.

THE BIM-READY ORGANISATION

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A BIM ORGANIZATION: DEVELOPING PEOPLE, PROCESS, TECHNOLOGY

As you embark on your digital transformation journey in AECO, let's delve deeper into the BIM Organization and the BIM Team roles.

Whether it's in the form of data, models, client interactions, or project design deliverables, the BIM organization's core ability is to deliver high-quality information consistently. BIM projects require skilled individuals and reliable organizational processes. This may mean internal upskilling or retraining to understand information circulation within your organization and project environment, often extending this by also educating clients and stakeholders about best practices.

Clear scopes, standards, and practices for BIM projects are crucial, involving mastery of ISO19650 standards, defining BIM objectives, scope, and deliverables, and understanding the BIM project maturity path. This requires both strategic and operational BIM teams. Information Producers - BIM Detailers and Modellers - are at the core of this team, supported by BIM Coordinators and Information Managers who ensure sound data security and manage information flow within the project. BIM Managers and Digital Leads provide executive-level support, ensuring reliable, valuable information flow, contributing to project success and efficiency.

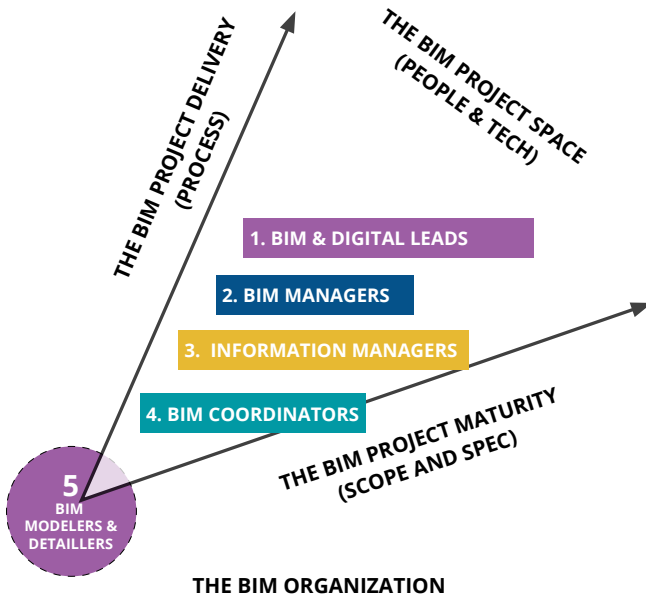


Figure X. Understanding the BIM Organization and BIM Team Hierarchy in simple terms.

THE BIM ORGANIZATION ORGANOGAM

Digital design and delivery enhance both internal processes and external services. Internally, it boosts communication, workflows, efficiency, and performance. Externally, it provides clients with augmented and alternative services. A successful digital delivery team is much more than just an IT guy with a Revit license. BIM isn't a one-person job; it's a team sport involving both internal and partner firms. Attempting to do it all can lead to fatigue, failure, and a return to old practices.

Your digital delivery team structure should be unique to your organization. Active leadership and management support are crucial. Engage your employees in building this structure, considering their talents, skills, interests, and career goals. The transformation takes time, but you might be surprised by who is interested and can contribute in this area!

There are particular key roles and responsibilities

There are key roles and responsibilities to ensure a digital delivery team is well balanced. It is helpful to start articulating this in your organization, and develop talent suited to these roles and responsibilities. You can think of a digital delivery team in two hierarchies or responsibility areas:

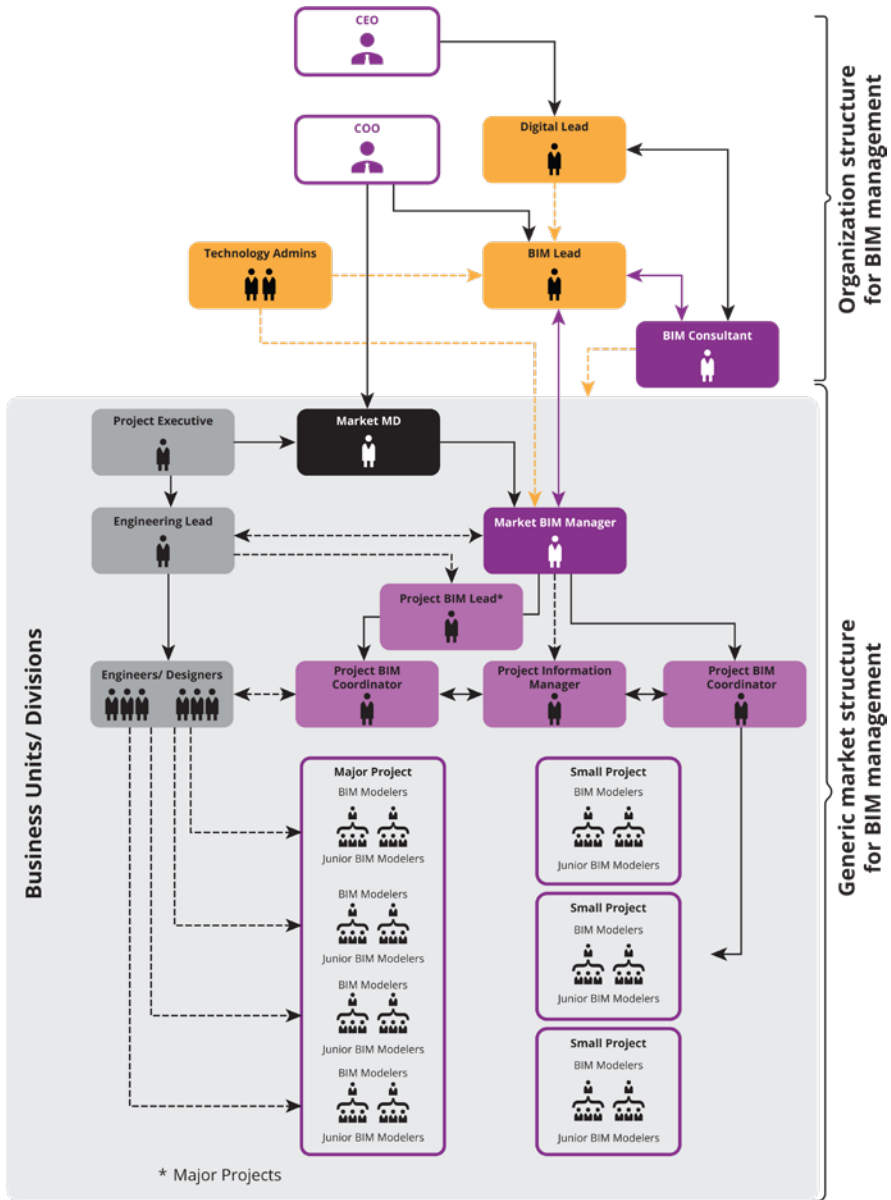
1. BIM and Digital Management Team

The BIM and Digital Management Team is responsible for the strategic implementation of BIM within the organization. They define the vision, set goals, and establish standards and protocols. They also ensure that the necessary resources, including software, hardware, and training programs, are available for the team. Their role is crucial in driving the digital transformation, fostering a culture of innovation, and ensuring that the organization keeps pace with industry advancements.

2. BIM and Digital Delivery Team

The BIM and Digital Delivery Team, on the other hand, is responsible for the practical application of BIM on specific projects. They use BIM tools and processes to design, analyze, and visualize projects. They collaborate with various stakeholders, both internal and external, to ensure that the project is delivered efficiently and effectively every day. Their role is hands-on and requires a deep understanding of BIM tools and processes.

In essence, while the Management Team sets the direction and provides the resources, the Delivery Team navigates the path and delivers the results. Both teams are essential for a successful BIM implementation and they must work together, with clear communication and shared objectives.



THE BIM ORGANIZATION

THE DIGITAL LEAD

The Digital Lead is a strategic role. The Digital Lead is responsible for overseeing and coordinating the implementation of digital technologies, including BIM, across all projects. This role involves strategic planning, team management, and hands-on technical work. The Digital Lead or BIM Lead works closely with project teams, clients, and other stakeholders to ensure the effective and efficient use of digital technologies and BIM methodologies across the organization and firms ecosystem.

Key Responsibilities

1. **Develop and implement** a comprehensive digital strategy, including BIM, for the organization.
2. **Oversee the application** of digital technologies across projects and provide necessary technical training.
3. **Collaborate and advise** project teams in the development and implementation BIM execution plans.
4. **Stay updated** with industry standards and ensure necessary technical and educational resources are available for project teams.
5. **Monitor and adjust** the performance of digital technologies and BIM methodologies on projects as needed.

Key Interactions

1. **Work closely with project teams**, clients, and other stakeholders to ensure the effective and efficient use of digital technologies and BIM methodologies.
2. **Collaborate with IT** and other departments to ensure the necessary hardware and software resources are available for the project teams.
3. **Report to senior management** on the performance and effectiveness of digital technologies and BIM methodologies on projects.

Skills and Qualifications

1. **1.5 – 10 years industry experience** in a digital technology or BIM leadership roles
2. **Strong knowledge of BIM** standards, methodologies and software
3. **Excellent leadership** and team management skills.
4. **Excellent communication** and interpersonal skills.
5. **Strong problem-solving** and decision-making abilities.
6. **Degree** in engineering, architecture, construction management, or a related field.

THE BIM MANAGER

The BIM Manager retains accountability BIM implementation within projects in a market. This role is more specific and technical. A BIM Manager leads the BIM team(s) and provides project-specific support. BIM Managers support Digital Leads on the ground. They are responsible for data integration between databases and BIM model system codes. They also manage the performance tracking of projects and ensure efficient BIM execution. Furthermore, they lead innovation and experimentation with new BIM technologies within the market.

Key Responsibilities

1. **Lead the BIM team(s)**, assess capabilities, and provide project-specific support.
2. **Provide specialist BIM** input into the project digital platform at all stages.
3. **Support data integration** between databases and BIM model system codes, and manage project performance tracking.
4. **Work with Project Executives** to ensure efficient project BIM execution and resource utilization.
5. **Manage BIM software use**, lead innovation, and experiment with new BIM technologies within the market.

Key Interactions

1. **Provide strategic input** and report on the health of BIM implementation, including people, market, LOIN adoption, and project progress.
2. **Assess training needs of the BIM team**, develop strategies, and ensure conformance to ISO 19650
3. **Collaborate with IT** and engage with clients and stakeholders to address BIM scope, technical challenges and understand requirements.

Skills and Qualifications

1. **1.5 – 10 years BIM management experience.**
2. **Proficiency** in modeling, federation, and information management.
3. **Strong knowledge of ISO19650 and BS EN 17412** with completed internal leadership training.
4. **Skills in data analytics**, such as Excel, SQL, Python, and PowerBi.
5. **Excellent problem-solving** and communication skills with advanced technical expertise.
6. **Degree** in engineering, architecture, or construction management or a related field.

THE INFORMATION MANAGER

The Information Manager plays a key role in ensuring efficient management and utilization of data, information, and knowledge to support project success. This role involves overseeing the collection, organization, storage, retrieval, and dissemination of information essential to the delivery of projects. The Information Manager is responsible for maintaining data integrity, automating information workflows, and facilitating collaboration among stakeholders.

Key Responsibilities

1. **Develop and implement** a comprehensive information management strategy, set up and manage CDEs, project-specific cloud collaboration platforms.
2. **Establish and maintain** robust storage, organization, and retrieval systems for project-related data and documents, ensuring data security and adherence to policies.
3. **Promote effective collaboration and knowledge sharing among** project stakeholders, and perform regular audits and quality checks on models, data, and documents.
4. **Support project compliance to ISO 19650**, Information Production Methods & Procedures, and the Project Information Protocol.
5. **Monitor changes in data privacy laws**, keep up with the latest information management technologies, and look for opportunities to increase efficiency.

Key Interactions

1. **Train team members** on effective information management practices and **collaborate with** the BIM manager, BIM Coordinator, clients, and project stakeholders to understand their information needs.
2. **Collaborate** with the IT team, to develop disaster recovery and data backup plans, ensuring the safeguarding of critical project information.
3. **Generate reports and analytics** for the BIM Manager and Project Executives to evaluate the effectiveness of information management practices.

Skills and Qualifications

1. **3 – 5 years proven experience** in information management, preferably in an engineering design consultancy or a related industry.
2. **Strong knowledge** of ISO19650 and BS EN 17412.
3. **Attention to detail** and a commitment to data accuracy and security.
4. **Strong knowledge of CDE's**, information management tools, software, and best practice.
5. **BIM** and data analytics skills preferred.

THE BIM COORDINATOR

The BIM Coordinator is a project specific role accountable for the successful implementation of BIM processes and standards on the project. This individual collaborates closely with the project team, Project Executives, and BIM Manager to ensure the efficient and effective use of BIM technology and methodologies. The most senior BIM coordinator on a project typically acts the BIM project lead for the project also.

Key Responsibilities

1. **Organise and lead weekly interdisciplinary model coordination** meetings, establish project BIM coordination and collaboration strategies.
2. **Initiate and maintain cadence of model federation** with project stakeholders for timely information exchange.
3. **Implement and manage the baseline LOIN**, authoring templates, and content libraries, and capture improvements.
4. **Co-develop and maintain project delivery documents** (BEP/MIDP/TIDP/Scope Clarification, Capability/Capacity Assessments, etc.) with BIM Managers.
5. **Ensure adherence to project protocols**, evaluate and test BIM technologies/workflows, and identify opportunities for efficiency enhancement.

Key Interactions

1. **Report to the project leadership team** and BIM manager on project digital health, and **provide training and mentoring** to BIM modelers and detailers.
2. **Work closely with the Information Manager and IT team** to ensure the CDE is functioning well, and address technical challenges related to BIM software and collaboration platforms.
3. **Engage with clients and external stakeholders** to understand their expectations and requirements by evaluating their EIR's and BEP's.

Skills and Qualifications

1. **5 – 10 years proven experience** in BIM coordination and project management experience in industry.
2. **Problem solver with advanced skills in modelling**, federation & information management skills.
3. **Strong knowledge of ISO 19650 and BS EN 17412.**
4. **Proficient in BIM software** (like Autodesk Revit, C3D, P3D, Navisworks, Inventor, ACC, Bentley suite, etc.) and **familiar with coordination and data analytic tools** (such as Plannerly, Solibri, BIMcollab, Dynamo, and Python).
5. **Degree** in engineering, architecture, or construction management or a related field.

THE BIM MODELERS

BIM Modelers are the virtual builders who translate the engineer's design into a contextual 3D model, acting as the information container for the final design deliverable. They capture all design data accurately and can be specialists, technicians, technologists, or qualified engineers with the required discipline knowledge and BIM skills.

Key Responsibilities

1. **Execute the 3D digital build** with the required authoring software to accurately capture the design and all design-related data, while considering the context and buildability of the model elements.
2. **Work with the BIM Coordinator** to ensure the baseline LOIN is achieved using the correct templates, libraries, and config files.
3. **Collaborate with the engineer/designer** to manually add all required metadata not automatically generated, ensuring data accuracy.
4. **Contribute to the BIM collaboration strategy** and take ownership of multidisciplinary interface coordination during the digital build, while achieving completion of various aspects of the digital build as set out in the MIDP and TIDP.
5. **Maintain ongoing project adherence to the BEP/EIRs** and prepare 2D design detailing and annotations as needed.

Key Interactions

1. **Collaborate closely with the design team and the BIM Coordinator** to ensure accurate communication of design intent and smooth flow of information via the CDEs.
2. **Flag any issues encountered during the digital build** to the BIM coordinator urgently to avoid delays, and clearly communicate detailing requirements to the BIM detailer.
3. **Engage with clients and external stakeholders** to understand their deliverables' interfaces and timings.

Skills and Qualifications

1. **1.5 –10 years industry experience** in architecture, engineering, or construction.
2. **Advanced modeling, model federation**, and information management skills.
3. **Multidisciplinary modeling skills** highly desirable.
4. **Strong knowledge of ISO19650 and BS EN 17412.**
5. **Proficient in BIM Modeling software**, data fusion and analytics advantageous.

THE BIM DETAILER

BIM Detailer focuses on the publishing of 2D graphical design deliverables and maintaining the draughting or drawing office standards for models and drawings. They handle the time-consuming task of 2D detailing and drawing production, thereby enabling increased capacity for the BIM modelers.

Key Responsibilities

1. **Communicate design intent effectively on 2D sheets or layouts** from design details, annotations, and markups produced by the designer.
2. **Deliver on the detail scope and requirements**, including LOIN at each stage of project delivery.
3. **Prepare 2D design detailing and annotations**, and be accountable for 2D deliverable quality at the point of publishing.
4. **Collaborate with the BIM modelers** and use approved templates and configuration files to further detail from their modeling work.
5. **Plan sheet/layout strategies with the BIM Modeller and Coordinators**, understand the project's BIM Execution Plan, MIDP, TIDP, and adhere to the project information standard.

Key Interactions

1. **Work closely with the design team** to ensure the design intent is accurately communicated and understood during detailing.
2. **Work closely with the BIM Modeler, BIM Coordinator, and Information Manager** to ensure the smooth flow of complete and coordinated information via the CDE.
3. **Flag any issues encountered during detailing to the BIM coordinator** as a matter of urgency to avoid unnecessary delays to the process.

Skills and Qualifications

1. **1 – 5 years industry experience** in architecture, engineering, or construction.
2. **Multidisciplinary detailing skills** desirable.
3. **Proficient in the use of BIM modeling software.**
4. **Has ambition** to develop into a BIM modeller.

TRAINING

Udemy: Offers building information modeling (BIM) courses that teach designing, customizing, and modeling digital building projects.

Revit: Offers courses that focus on the software and its interface, modeling tools, component management, and other architectural elements.

Coursera: Offers courses that teach BIM fundamentals, retrieving information from BIM models, and other technical skills.

freeCodeCamp: Offers project-based video tutorials for beginners.

Skillshare: Offers a course that focuses on the fundamentals of Autodesk Revit Architecture.

YouTube: Offers various tutorials and courses on BIM and Revit, including channels like CAD in Black and Kyle Sinko.

Baker Baynes: The Baker Baynes Specialist Series allows one to custom-build a training outline by choosing from various BIM and related technology topics that meet your proficiency and project requirements. Our BIM Specialist Series helps one become proficient with BIM methodology, workflow and best practices. The ISO 19650 international series of standards (SANS 19560) are considered in the modules covering a range of BIM-related software applications, all in the context of BIM principles. Topics range from Information management, BIM model management and BIM strategy to BIM's legal, financial and social impact.

Visit www.Bakerbaynes.com

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Visit www.modena-aec.co.za/skill-resources/

Operam Academy: To adopt BIM successfully, you need to know how to manage information effectively. Our award-winning online BIM training courses can make you, your team, and your business BIM READY.

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Civil Designer: A complete solution for the civil infrastructure design component of all your projects. Design data can be exported via the IFC Open Bim format at any stage in your design process. This means that the program can fit directly into your existing BIM workflow. You can complete CPD accredited training in Civil Designer's integrated terrain, roads, and pipes modules.

Find out more here: www.civildesigner.com/training-centre/ or info@civildesigner.com

SOM Survey Instruments: At SOM Survey Instruments, we go beyond just selling surveying solutions – we're your partner in achieving BIM success! Our dedicated SOM Support and Training programs ensure you get the most out of your investment from: Comprehensive Training: We offer a variety of training options, from equipment operation to advanced data processing techniques. Choose from on-site, online, or customized training solutions to fit your specific needs ensuring seamless integration and optimal performance. Ongoing Expert Support: Our dedicated support team is always available to answer your questions and troubleshoot any challenges you may encounter on or off the field to provide ongoing technical assistance. From GNSS Solution, Drone Surveying, Lidar solutions and CAD software, you can invest in your success with SOM Dedicated Support and Training to enhance your BIM experience.

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CONVENTION FOR A DIGITAL SOUTH AFRICA

Laying the foundation for the digital transformation of South Africa's built environment

As BIM gains momentum worldwide, South Africa is taking proactive steps to enhance its construction industry through the development of a National Annex to ISO 19650. Similar to the UK's adaptation, this annex will tailor BIM standards to align with South Africa's unique construction landscape. It will encompass industry-specific procedures, procurement processes, and supplier selection criteria, ensuring efficient BIM implementation across projects. By providing clear guidance and requirements, the annex aims to foster collaboration, improve project outcomes, and drive innovation in South Africa's construction sector, setting a benchmark for excellence.

SANS quietly published SANS(ISO) 19650 Part 3: Operational Phase of the Assets in August 2023 after public comment closed on the 25 May 2023. This is the completion of the efforts of several people, who represent different parties, having worked together to ensure that South Africa adopts the international standard for the digitisation of information about building.

It has been an interesting ride for BIMcommUNITY.Africa who have delivered on their undertaking. It is also a success for some of the South African Facilities Management Association members who took the initiative to work around uniquely South African obstacles. Now that we have adopted the standard, we need to change focus to how we are going to implement the SANS 19650 suite. This is catered for in the approach applied by the ISO (International Standards Organisation) and is to be defined in the South African National Annex.

There is no debate as to the advantages of BIM when used in the construction documentation for most projects. The ability to see the detailed and accurate interface between the many subassemblies and components that make up a building is a major advantage over any existing 2D options. The issue however is that much of this data is lost once that portion of the work is complete, the facility commissioned or information that is isolated in proprietary data formats. There is also very little interest in the retaining and using data by the property and portfolio management sectors.

This needs to change with the focus of our efforts directed into making ISO 19650 a tangible and useful effective foundation for design professionals across the industry. By easing the interchange of information across disciplines while collating the essential data that will help the building owners and operators with managing their assets.

The preparation of the National Annex will require a lot of input. An Industry Focus Group is seen as the ideal vehicle for this effort under the direction of a contracted party.

For more info: www.bimcommunity.africa/bimcodesa

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SURVEY 1: BIM HARAMBEE 2024

In line with BIM Harambee 2024 tagged 'The Business, and People, of BIM' : We are simultaneously addressing 2 key issues, which are related:

- 1) the implementation of BIM throughout the organization from senior leadership in order to be, and remain, competitive;
- 2) the right environment and skills required for BIM professionals (and graduates) to be effective.

The purpose of this survey is to gather information regarding the theme among built environment (BE) professionals, students, and educators in South African built environment. Your responses will contribute to understanding the current landscape and identifying potential areas for improvement in BIM education and implementation. We, therefore kindly request you to participate in this survey.



SURVEY 2: COSTS ASSOCIATED WITH ADOPTION OF BIM

Goodman Phoshi, a second-year master's student at Wits University, is currently conducting research on the costs associated with the adoption of Building Information Modelling (BIM) by consulting firms. The research aims to assess the adoption costs of Building Information Modelling (BIM) by consulting firms, with the objective to analyze how these costs are distributed across the project's six stage lifecycle and what are the key issues at different project stages. If you decide to participate, you will complete an online survey that will take approximately 10-15 minutes.



Modena AEC & Infrastructure are pleased to announce their gold sponsorship of the upcoming BIM Harambee 2024 event, underscoring their commitment to driving digital technology and BIM solutions within the industry. This year's theme, The Business and People of BIM, perfectly aligns with their mission to foster innovation and collaborate with organizations to enhance their BIM capabilities.

As leaders in design and technology consulting, Modena AEC & Infrastructure serves as dedicated BIM partners, ensuring clients remain at the forefront of technological advancements. In an industry that continuously evolves, staying relevant and competitive is paramount; by leveraging industry-specific partner solutions and the extensive Autodesk portfolio, they promote collaboration and deliver state-of-the-art technology that enables clients to anticipate real-world performance and excel in a competitive landscape.

Their award-winning team, renowned for its technical expertise and support, is committed to enabling clients to deliver exceptional projects.

Aligned with the 2024 theme of BIM Harambee, Modena AEC & Infrastructure addresses two critical facets of BIM implementation:

- **Organizational Integration:** They advocate for implementing BIM across organizations, beginning with senior leadership, to sustain a competitive edge.
-
- **Skills Development:** They emphasize creating conducive environments and cultivating essential skills for BIM professionals and graduates to thrive.

Achieving BIM readiness entails ensuring both organisational fitness and individual proficiency. In support of this year's theme, Modena AEC & Infrastructure stands ready to assist with BIM implementation, management, training, and technology, reinforcing their commitment to advancing BIM practices across the industry.

Attend BIM Harambee 2024 discover how Modena can help you maintain a leading edge in the dynamic world of BIM.



Thank you for joining us at BIM Harambee
2024 and helping to Raise the BIM Tide.



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