

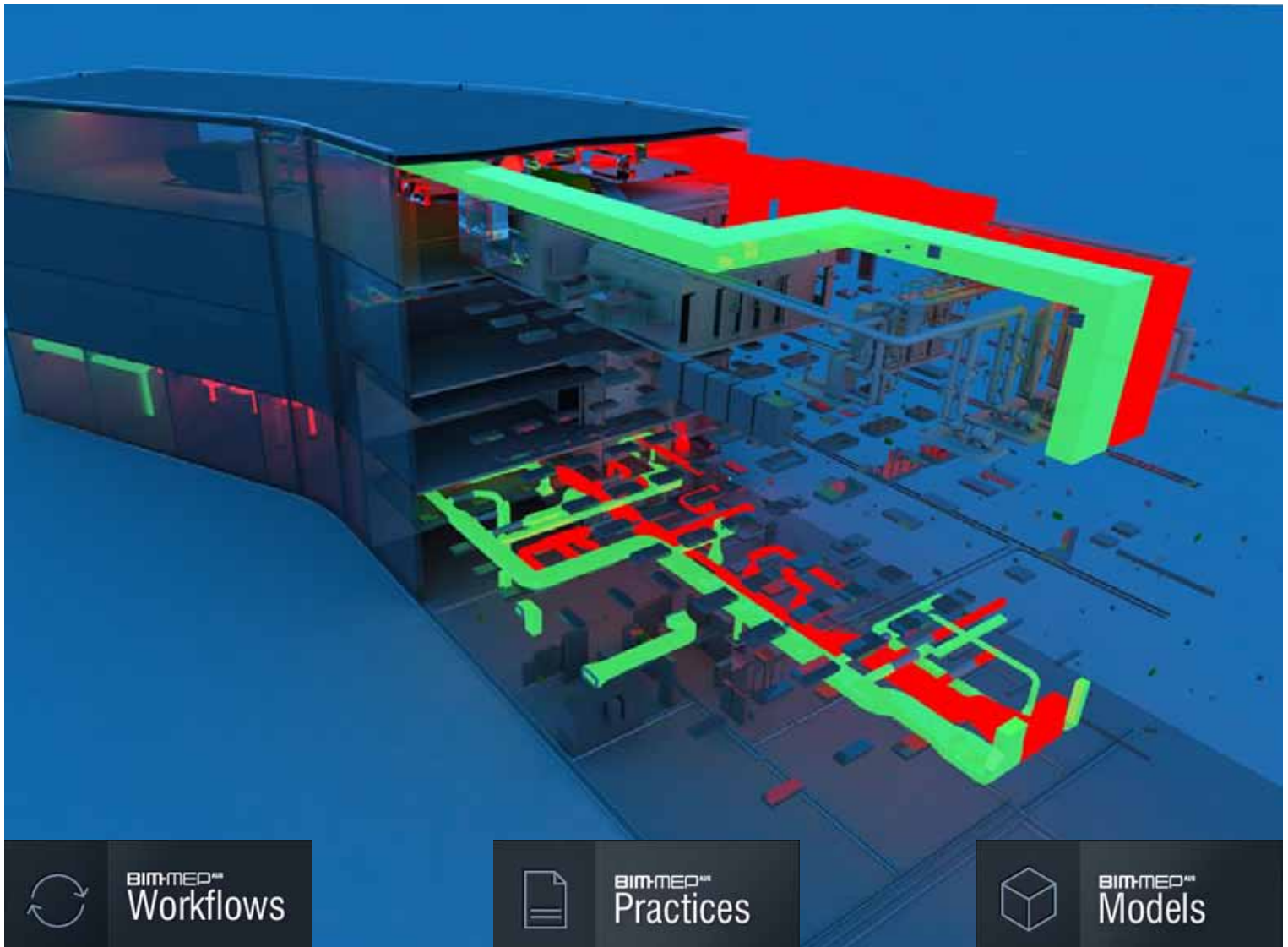
**BIM-MEP<sup>AUS</sup>**



**AMCA**

**WE SPEAK FOR  
AIR CONDITIONING**

## BIM-MEP<sup>AUS</sup> ROAD MAP 2012 Parliamentary Launch



**BIM-MEP<sup>™</sup>  
Workflows**



**BIM-MEP<sup>™</sup>  
Practices**



**BIM-MEP<sup>™</sup>  
Models**

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## PRESIDENT'S FOREWARD

On behalf of the Air Conditioning and Mechanical Contractors' Association of Australia, I am pleased to present the 2012 BIM-MEP<sup>AUS</sup> Report and Roadmap.

For the past two years my association has been placing a high priority on supporting the adoption of BIM technologies.

We have:

- Held information forums;
- Participated in workshops;
- Collaborated with software vendors;
- Conducted training programs;
- Garnered support and participation from supply chain members to develop standards and product information.

Productivity growth in the construction industry has stalled. Widespread adoption of BIM technology will reverse this trend.

BIM is being adopted and used in the industry but the take-up is patchy.

Our goal is to spread the benefits which can be achieved through BIM-MEP<sup>AUS</sup> to all corners of the industry, big and small companies and projects alike.

All of the industry and its clients have a role to play in BIM adoption and share the benefits it can provide. Government as a policy advocate and major client; private sector clients; designers; head contractors; specialist contractors and facility managers. Unfortunately each of these parties has not embraced BIM with the same level of enthusiasm.

I hope that through the efforts of my association and the publication of this status report and roadmap, we can encourage further adoption of BIM-MEP<sup>AUS</sup>. Mandating the use of the BIM models and processes by clients is an important step towards achieving the full productivity benefits.

A handwritten signature in blue ink, appearing to read 'Earl Sakareassen'.

**Earl Sakareassen**

National President

Air Conditioning and Mechanical Contractors Association of Australia

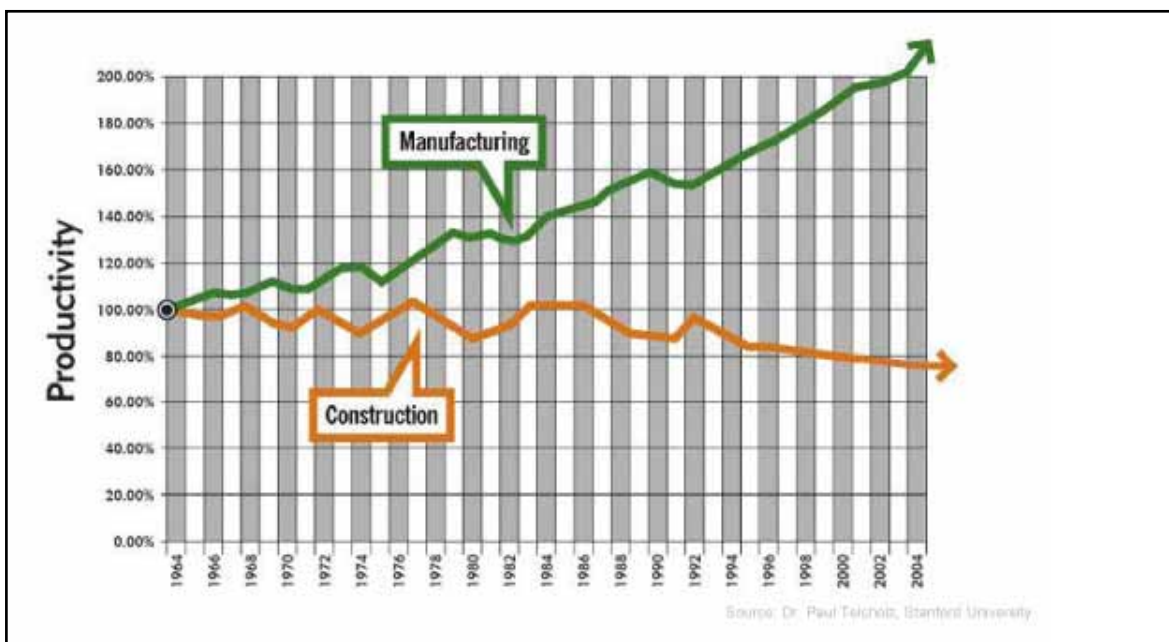
## DRIVING PRODUCTIVITY IMPROVEMENTS IN THE BUILDING AND CONSTRUCTION INDUSTRY

It has been reported that the Australian construction industry wastes some 30 per cent of all its efforts through rework and inefficient practices. If that wasted effort were to be reduced by only one-third, it would lift Australian construction output by more than \$20 billion annually as well as making a significant contribution to the industry's environmental footprint.

If the changes required to achieve that reduction were also to flow throughout the supply chain then the improved output would be substantially higher.

Embracing the ethos at the core of integrated project delivery (IPD) practices, modelling techniques and supply chain integration practices have been the keys for a number of industries (within Australia and globally) to achieve notable productivity gains within the past forty years.

This has not been the case within the construction industry. As illustrated below at Figure one, drawing upon the USA context, productivity in the construction industry during the past forty years has remained unchanged and is consistent with findings in Australia.



**Figure 1:** Productivity in manufacturing versus construction industry - Stanford University Centre for Integrated Facilities

Although technology is widely used within the Australian design, construction and facility management sectors the significant fragmentation and adversarial business models have prevented any real efficiency to be achieved across the industry. The project teams have created impediments to innovation as ongoing projects do not incorporate systematic efforts towards innovation through rigid organisation practices.

Whilst the construction industry does embrace technology it is consistently slow in adopting new project management and workflows practices that leverage technological advancements. Whilst this can be partly attributed to the “one-off or bespoke” nature of construction activities with each project essentially, there is a lack of focus on process improvement and collaborative integrated project delivery practices.

“The BIM-MEP<sup>AUS</sup> initiative aims to remove the impediments to innovation allowing efforts that incorporate systematic innovation through best of breed practices. Acknowledging project teams will never remain the same from one construction project to the next, standardising technological processes and practices will remove any barriers of information flow and ensure best practice diffusion can occur amongst different team compositions irrespective of their position within the supply chain”. – AMCA

## DRIVING INDUSTRY CHANGE

Prior to the AMCA initiative commencing in 2010, the marketplace was unclear as to the leadership required to resolve the implementation of BIM and IPD within the Australian construction and building services industry. Many industry commentators suggested that the Commonwealth Government should play a significant role whilst others suggested industry associations should be taking a more pro-active role in framing the direction required. There is no doubt now that the Commonwealth Government has a role to mandate BIM and look to engage further by providing seed funding to promote the formulation of best practice ultimately driving real productivity improvements outcomes.

However, movement in this space and the demand for reform was a matter of urgency, particularly when the construction industry was being increasingly requested by clients to deliver BIM on projects and this was creating significant difficulties in terms of defining deliverables as well as industry skills and capabilities to work within BIM.

The AMCA took the position that they needed to fund and launch the BIM-MEP<sup>AUS</sup> initiative. The key objective of launching the initiative was to facilitate the implementation of BIM and IPD within the Australian Construction Building Services Sector to address the industry reform required. The three premises have maintained the BIM-MEP<sup>AUS</sup> initiative direction:

### **1. Vendor Independence:**

The initiative is vendor independent and is funded principally by AMCA (and industry in-kind contributions), which are provided on the basis of vendor independence.

### **2. Industry Collaboration:**

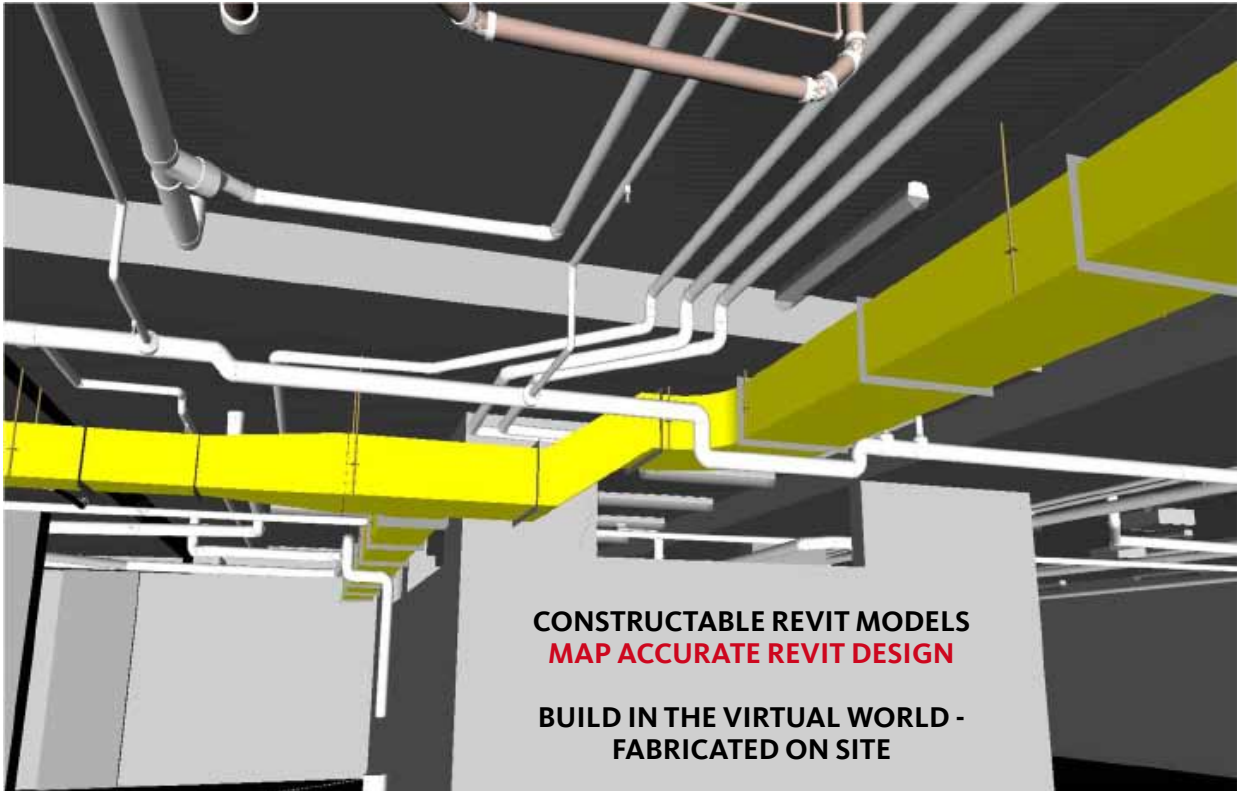
The initiative is based on the premise that organisations working within industry supply chains need to have standards for efficient interchange of information, supporting IPD processes. It is non-productive to compete on industry standards.

### **3. Shared Development Costs:**

The initiative largely relies on industry level collaboration and shared development costs related to the standards, generic BIM and computer aided drafting (CAD) / computer aided manufacturing (CAM) models.

“There have been major challenges to the adoption of BIM industry standards. Many of the standards appear to have been developed by designers and software specialists without due consideration of the project delivery workflows requirements. The development of the BIM-MEP<sup>AUS</sup> standards builds on established industry practices for the first time. The focus on interoperability within BIM in our view was holding back the industry – whilst we are looking to be Industry Foundation Classes compliant we are happy to focus on a vendor independent but vendor specific workflow. The Australian Industry is now focused on Revit for services and Fabrication for ductwork and mechanical services piping”. – AMCA

During 2012, a number of Australian projects have commenced the adoption of specifications, standards, models and workflows pursuant to the BIM-MEP<sup>AUS</sup> initiative. The initiative has now gained widespread industry support including in-principle adoption by many of Australia’s largest developers and builders. Given its practical application it is becoming the industry standard for BIM based project delivery and supply chain integration within the building services sector.



**2012 Innovation:** Design Models can now be developed into a construction model. With the use of the BIM-MEP<sup>AUS</sup> Autodesk Revit add-in and the latest Fabrication Workflow we are starting to realise the benefits including savings on site in terms of site positioning hangers and reduced site clashes.

## PROACTIVE INDUSTRY LEADERSHIP AND ACTION

The AMCA industry leadership has included the following actions:

- Appointment of an industry collaborative BIM Steering Committee of the Project Board to undertake an investigation into the challenges and opportunities of BIM for the building services and specialist contracting industry. Representatives of the BIM Steering Committee included representation from specialist building services contractors,

consultants, architects, builders, suppliers, and software vendors. Establishing workgroups to progress aspects.

- Reviewing existing standards and protocols, supporting the improvement via formal feedback.
- Technical research through international study tours to keep abreast of global market intelligence.
- Facilitating workgroups that focus on the development of industry best of breed specifications for plant, equipment and fittings.
- Development and progressive release of a suite of foundation guidelines, standards, templates and protocols to encourage the adoption of the initiative.



- Engagement with computer software vendors to explore communication and transfer synergies so there is a coordinated industry solution. This has enabled different software platforms to work together and started to remove the disconnect in data, information and knowledge in the industry.





- Information and technical sessions delivered in various forums with the key focus at the BIM-MEP<sup>AUS</sup> annual forum events (held 18 November 2010, 27 July 2011, and 2 August 2012). During 2012, software conforming to the BIM-MEP<sup>AUS</sup> standards was released as part of a Roadshow to Brisbane, Sydney, Adelaide, Melbourne and Perth.
- Educating clients and Government at all levels about benefits of BIM.
- Training and development planning for industry including the development and piloting of courses aligned with a career pathway (to be rolled out in September 2012).
- Signing memorandum of understanding with aligned industry associations to partner and collaborate efforts of BIM adoption.
- These organisations have included:
  - Pump Industry Australia;
  - National Electrical and Communications Association;
  - National Fire Industry Association;
  - Fan Manufacturers' Association of Australia and New Zealand;
  - Master Plumbers and Mechanical Services Association of Australia; and
  - Australian and New Zealand Revit Standards.



## CHANGE MANAGEMENT EMBRACING PROJECT DELIVERY AND SUPPLY CHAIN INTERACTION

There is a time lag before individual businesses will embrace BIM and hence the importance for industry to help set the framework for change management to be adopted. Some businesses are ahead of the curve and work in an isolated or lonely BIM environment. Adding pressure is the lack of continuity as key personnel leave organisations to seek other opportunities and therefore management are

required to re-establish the drive of adoption.

The AMCA believe change management can occur at the industry, organisation and functional level if the BIM-all-the-way workflow is embraced as highlighted below in figure two.

The BIM-all-the-way workflow seeks to take the design model and develop it to a constructible model providing the services coordination and data needed.

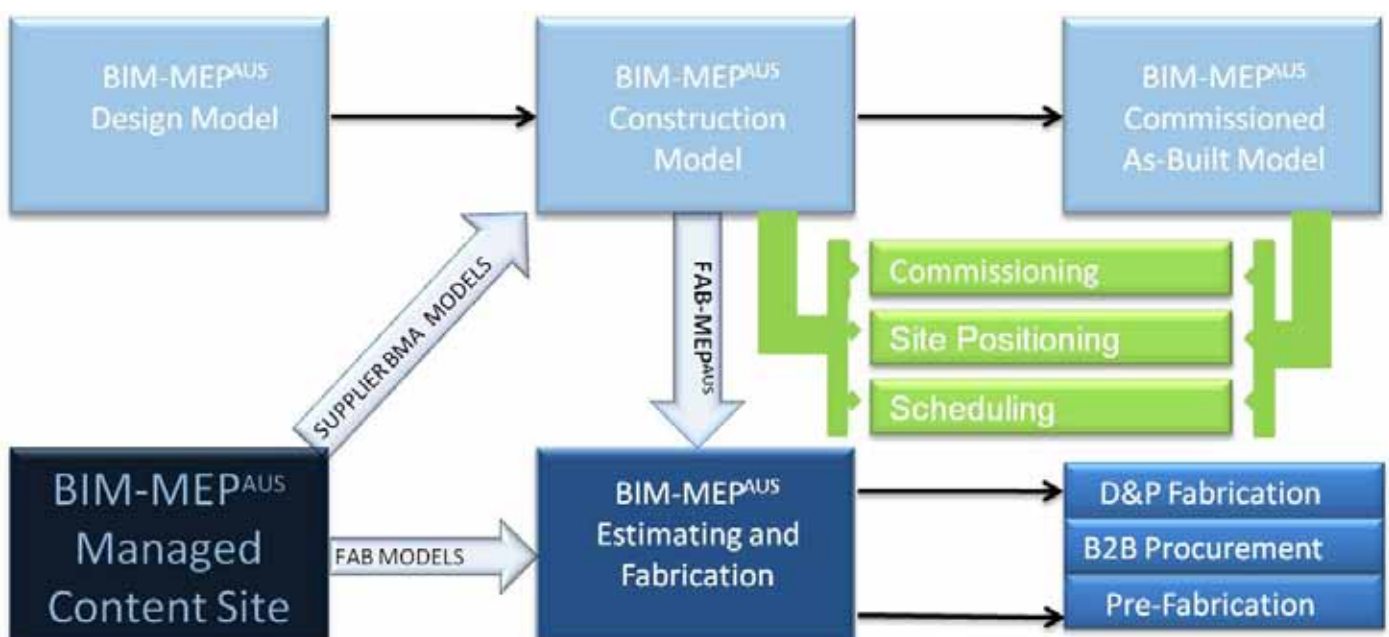


Figure 2: BIM-all-the-way industry workflow

Key requirements to leverage the potential of the system are:

**Consultants and designers adopt an industry agreed BIM-MEP<sup>AUS</sup> Autodesk Revit add-in which will:**

- reduce the costs of content development;
- be best of breed;
- incorporate the needs of Australian designers; and
- incorporates relevant Australian Standards and established engineering data sets approved by the initiative.

**The supply chain adopts the use of Content built to standards to assure:**

- Design to Fabrication Workflow are reliable and effective.
- Assures reliability in terms of construction and FM data sets.
- Is provided at a cost and quality which assures industry adoption.
- Enables the opportunity for procure-to-pay activities to exist.
- Development of an industry standard BIM Execution Plan which includes both design and construction requirements.
- Development of the BIM-to-Field Applications and commissioning.

The workflows are now being proven in practice and provide the Australian Construction Industry with a unique and leading edge approach to leveraging BIM and IPD.

## FUTURE - THE ROAD AHEAD

The most logical path ahead to move the industry forward includes:

### 1. Expedite the level of leadership and coordination across the supply chain

- The Commonwealth Government should consider BIM to address the market failure and align with the global responses demonstrated by progressive Governments including those of Singapore and the United Kingdom.
- Given the productivity improvements exist as demonstrated by proof of concept, the AMCA recommends the Commonwealth Government should engage in the policy debate and actively support BIM adoption. This is important given its role in the procurement of facilities irrespective if that involves the construction, leasing or occupation. The funding of key aspects for the BIM-MEP<sup>AUS</sup> initiative should be also considered to fast-track activities and promote wider industry adoption.
- Industry associations have a role to remain pro-active in the alignment and continuation of bringing renewed vigor of joint approaches to develop systematic approaches to BIM and specific to BIM-MEP<sup>AUS</sup>.
- The BIM-MEP<sup>AUS</sup> future Governance framework expanding beyond a project to a proficient entity is an option to provide an appropriate framework and best practice for future engagement and services required.

### 2. Industry skills, training and education development agenda

- Recognising that there are courses currently developed or progressively being developed there are equally opportunities for collaboration to enhance offerings to the marketplace. The training and education outcomes must be aligned with future qualification packages to raise the level of industry aptitude.
- Educational institutions at each level whether trade or engineering must embrace initiatives such as BIM-MEP<sup>AUS</sup> to ensure students are increasingly exposed to industry best practice and how to collaborative effectively when employed.
- Education must be multidisciplinary so the supply chain has a greater understanding and appreciation of the myriad of roles and responsibilities.
- Clients also have a role to be actively engaged within education to ensure their procurement procedures are referencing the tools and best practice within the industry and highlighting the value of BIM.

### 3. Re-affirmed enthusiasm for Software compatibility development

- Software vendors are now formulating responses pursuant to the BIM-MEP<sup>AUS</sup> initiative so data transfer in a collaborative environment can occur. To increase the adoption clients, head contractors and building services contractors should request the involvement of manufacturers and suppliers. This will ensure data transfer complements real life content creation of plant, equipment, and fittings within a competitive marketplace.









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