AUTODESK UNIVERSITY

BU24217

Driving Owner BIM Value in South East Asia

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Learning Objectives

- Understand the importance of having a purpose for BIM
- Understand how owner/developer organizations obtain value from BIM
- Understand how a life cycle approach to BIM drives return
- Understand the differences and challenges faced in different regions

Description

This session shows in detail how developers in South East Asia are getting value through the implementation of BIM beyond design. In this session, a review of 2 separate BIM implementations in the Philippines shows how they are achieving returns and the specific challenges that are being overcome in the emerging markets.

Your AU Expert(s)

Darcy Farrar is a specialist in BIM Implementation and project BIM Management, an area he has been working in for 7 years. From project wide BIM Management on multi-billion dollar projects to the implementation of technology and methodology in small scale sub-contractors, Darcy has a somewhat unique viewpoint on how BIM is implemented through a project lifecycle. This viewpoint has come about through project engagements across all segments of the project lifecycle and can be best described through 2 key statements;

“Everything is connected to everything”

“Nobody does BIM to do BIM”

These 2 principles now drive his role as solution architect for UNIBiM Services where he ensures that the implementation and use of BIM within organizations matches with their needs, budget and regional requirements.

Part 1: Owner value is better achieved across multiple project phases

Throughout southeast Asia real estate developers are asking the question “why am I not seeing any significant return from BIM?”. This is particularly true in Singapore where there is a nationwide government mandate to utilize BIM on projects.

Often the result Is based off several factors including;

1. The purpose for using BIM is not detailed or measured.
2. BIM is only implemented in a single project phase (e.g. design)

A major issue is the lack of a defined purpose for BIM and particularly the measurement of achieving that purpose often leads to a sentiment of not achieving returns. This lack of a purpose however more frequently leads to poor BIM specifications or the identification of BIM requirements that do not drive toward the expected result.

More frequently however the lack of return for BIM to owner/developers in ASEAN is due the only implementing BIM through the design period.

The Script Analogy

One of the best and most effective analogies that I have found to describe this is comparing the construction to the film industry;

The construction industry (from a particular point of view) is very similar to the film industry (particularly for residential and commercial building)

A film studio (developer) sees a market for a film (building). The film studio purchases a script from a script writer or team of script writers (architect and engineers). At this point, there is no return to the film studio and no reliable method to identify a good script (design) from a bad script. At this point the film studio hires a director (project manager), actors, cinematographers, set builders, etc. (Contractor and sub-contractors) to produce the film (building). It is then at the box office (sales) that the success of the film is determined.

In the creation of films value for each party is different. As with all industries return is based upon quality of output, which is measured differently.

Good films (project return to the developer) result from good scripts (designs) written by good script writers (architects and engineers).

Good films also result from good production teams (project manager, contractor and sub-contractors).

The best results occur from a good script with a good production team. Additionally, a good script can compensate for a slightly less effective production team and vice versa.

There are some critical items to note here;

1. Return is measured against the final film (project), not on only script (design), direction (project management) or production (construction).

2. Value for each party is different

    a. The film studio (developer) receives the financial returns

    b. The script writers (architect and design engineers) return for a good script (good design) is reputation and repeat business

    c. The director (project manager) and production team (contractor and sub-contractors) return is also improved reputation leading to more business.

d. The director (project manager) and production team (contractor and sub-contractors) also gain return from a good script (design) as it is easier to film (build).

Apologies to the film industry for this over simplification of how things work. Also apologies to the construction industry as this analogy most works best from the point of view of an owner/developer.

Part 2: Issues affecting construction in south east Asia

In developed markets, much of the drive and return for BIM is in a reduction in site manpower as labour costs are one of the more significant factors in overall project costs. This is not true for emerging markets such as the ASEAN region. In these markets the cost of labour is very low with huge pools of unskilled labour who are willing to work at very low rates.

This change in the cost structure of projects provides different drivers to the construction industry that include;

1. A lot of low skilled effort leads to issues with finished quality impacting customer satisfaction
2. Highly manual process combined with issues in traffic result in slow project delivery, again impacting customer satisfaction
3. Coordination and design issues result in delays in construction, while these rectifications also negatively impact finish quality
4. General levels of overall corruption not only boost project costs, but also drive very high levels of mistrust between organisations.

On a side note; corruption has been a challenge in the implementation of BIM in the ASEAN region as many BIM returns rely on transparency of information.

Part 3: A Case Study of a Residential Developer in the Philippines

Approximately 2 years ago a major residential developer in the Philippines (who are happy to have these results discussed but don't wish to be identified by name) embarked upon an implementation of BIM. This was not their first attempt.

They had some level of success with their housing group which has an internal design group. The high-rise group however had a few false starts, partly due to that group using external design consultants, partly due to the previously identified issues and partly due to another BIM issue impacting the region.

Much of the region equates BIM with 3D models, this drives an expectation that;

1. BIM is mostly done for the design phase
2. BIM can be achieved by access to modelling software and some basic training

As many of us know this approach rarely ends with the desired results.

It was 2 years ago when this organization contracted a BIM consultant to assist in their implementation of BIM. The key points they identified for their implementation were;

Issues

1. Design and coordination issues are a major factor in project delays and rework related costs
2. Main contractor costs include a high percentage to cover risk
3. Projects are always over budget and procurement performs a lot of work ordering additional materials
4. Design consultants are either do not have BIM capability or are unwilling to invest

Goals

1. BIM is to be used to identify and resolve coordination issues prior to construction start
2. Extract quantities from the BIM models to improve the accuracy of project costing

Limitations

1. Modelling will be performed by an internal team modelling from the drawings produced by external design consultants
2. There is no organisation defined role for quantity measurement
3. Additional technology will require major justification as this is one of the largest business costs for the organization, so use what is already in place where possible

Also, do it at an emerging market budget rate.

From these points the first step was to define how to achieve the results, which in-turn meant identifying the root causes of many of the issues.

Building the solution

One of the key elements UNIBiM believes in for BIM implementation is that the purpose for BIM is the key driver for what happens. Thus, this purpose was a key element in this implementation. The purpose of BIM for this organization is;

Positively impact project cost in terms of;

- Accurate budgeting
- Reduced contractor risk factors in bidding
- Limit design and coordination issues impacting construction

Before proceeding to methodology and then technology however the root causes for why these are not being achieved needed to be determined.

Cutting to the case the root causes were identified as;

Accurate budgeting

- A history of design and coordination issues meant that design layouts, particularly for MEP but also in some cases structure and architecture meant that quantity measurement was performed on drawings that did not reflect the construction results
- These design and construction issues were often not identified until part way through construction resulting in material wastage

Therefore;
Quantities need to measure from designs that better reflect the construction result.

Reduced contractor risk factors in bidding

- That same history of design and coordination issues meant that contractors had little trust in the design drawings and that trust is reflected in the fee structures.
- The general levels of corruption in the region meant that contractors had little trust in the legal system to resolve contract disputes further increasing risk factors in fee structures.

Therefore;
Trust will need to be built to drive this change in fee structures. This increase in trust will be a long-term goal driven through transparent communication of design results and use of the model as a visual aid through construction.

Limit design and coordination issues impacting construction

- The identification of issues is more difficult in a drawing based environment, which requires longer time periods to identify and resolve. This however is impacted by; the best staff going to work abroad for higher salaries, the hierarchical culture mean that people were unwilling to identify issues, and a history of issues with design and coordination were causing developers to reduce design times to get to construction where those issues were being resolved.
- The higher relative cost of technology implementation was putting the implementation of BIM in design consultants out of financial reach.

Therefore;
Modelling will be performed by a team within the developer's organization who can take better advantage of the knowledge of site teams to include construction methodology. The BIM process will be aligned to the final stages of the design phase to limit the cost implication of internal effort by the developer.

Working within the limitations

The second step was to define the methodology and then technology that would be put in-place to drive towards this goal.

The technology was the easy part, partly as the project was delivered under Autodesk Consulting, but mostly because one of the original limitations was to use technologies already within the organisation where possible. This does drive towards a direction of methodology, but as you will see provided difficulties with quantity measurement.

The technology available was;

- Autodesk Building Design Suite Premium
  - i.e. no Navisworks manage for clash detection
- Microsoft Office 2007
  - Not including access so no Revit DB Link

There was no quantity measurement technology in place and while SAP was being used for the financial systems, project budgets were imported as completed elements with a pre-formatted excel sheet.

This technology limitations meant that many of the methodologies had to be low-jacked to provide basic replication of functionality that was not available.

The organization also decided to go for a team of very fresh architecture and engineering graduates as their BIM team, which meant that while they had no bad habits, they also had almost no experience.

The most significant challenge however was the lack of an identified role for quantity measurement and cost control. The result was that the BIM team would be responsible for the measurement of quantities from the model, which ended up driving the way in which quantities were implemented.

Methodology to achieve the goal

The final implemented methodology to achieve the indicated goal was;

1. Implement the core BIM elements noted to result in a set of documentation where design issues are resolved and construction methodology is included.
    a. Data rich modelling
    b. 3D Coordination
    c. Documentation output
    d. Visual communication
2. Implement a primarily automatic quantity measurement system that is easy to check, preferably that will still work if external consultants start delivering models.
3. Add a BIM component to the bidding process providing bidders with time-locked models that they can review to understand the level of detail and coordination in the design, building trust.
4. Use the model for visual communication during construction to drive the site teams to build according to the design.

The UNIBiM approach to workflow and technology implementation

At UNIBiM, particularly in the ASEAN region, we have an approach to developing work methods and technology implementation. This is to use a phased approach that is very robust and wherever possible is not software version dependant. This can be described in the following development steps;

1. Make it work using base technology capabilities where possible
2. Make it easy to use
3. Make the results easy to check
4. Once it works add customization to reduce long chain processes

This ensures that at any point if the custom applications and routines stop working, or are not updated between versions that the work can still be performed.

This is represented in the implementation of this project.

Stage 1: BIM in design

The first stage was to enable the team to produce models and use those models to manage the coordination. Once the team could produce these models the quantities measurement process was implemented.

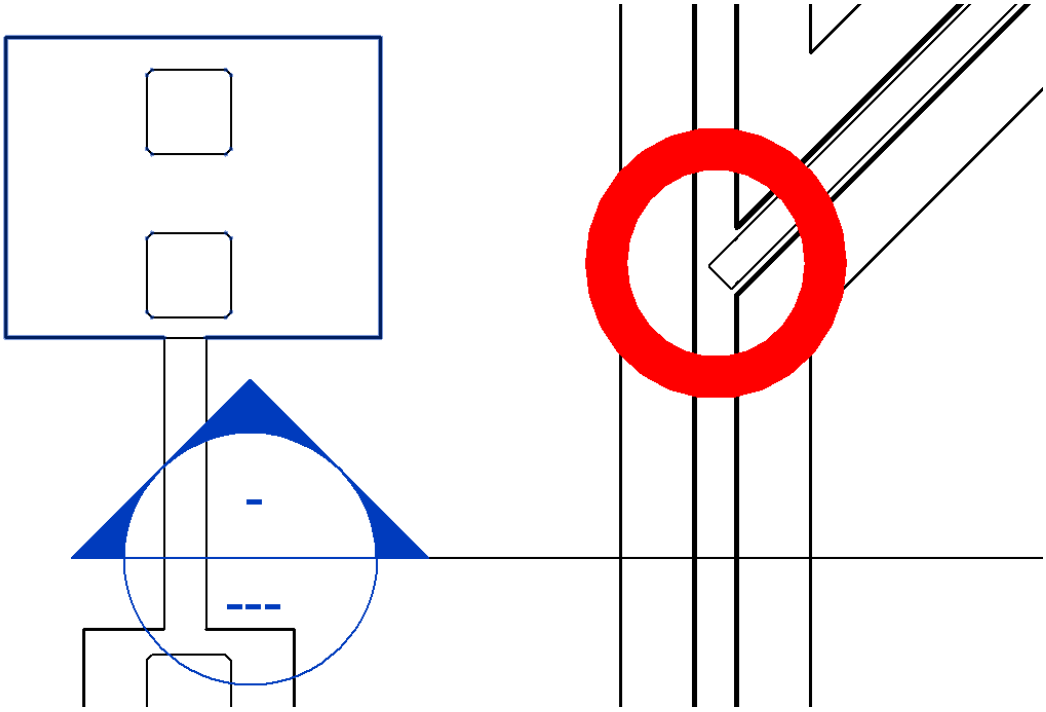
Modelling methodology, standards and the like are generally well understood. While the level of detail in the models the team produces is higher than the typical design models (closer to pre-construction/workshop levels of detail) this implementation was somewhat straight forward consisting of a training program followed by a mentoring program where BIM consultants are on-site with the team to help them through hurdles and challenges.

The implementation of modelling processes and standards also included elements which are not typical but provide longer term benefits to the project such as higher levels of coordinate system control.

The management of clashes for coordination required some effort. The lack of clash detection through Navisworks Manage was less of an issue than might be expected. The UNIBiM approach is to treat coordination as a proactive process. Long experience has taught us that relying of technology like Navisworks Manage or BIM 360 Glue often leads teams to be complacent towards coordination, which like health issues is best approached with the “prevention is better than cure methodology”. The implementation of service zones in ceilings,

combined with the lower complicity of residential design meant that clashing only really occurs in tight areas and junction points limiting the amount of effort required for coordination.

The management of clashes is performed in this case through a Revit model element acting as a clash marker. The details of the clash are stored as parameters of this object which is scheduled to provide management of the clashes along with effective clash documentation and statistics.

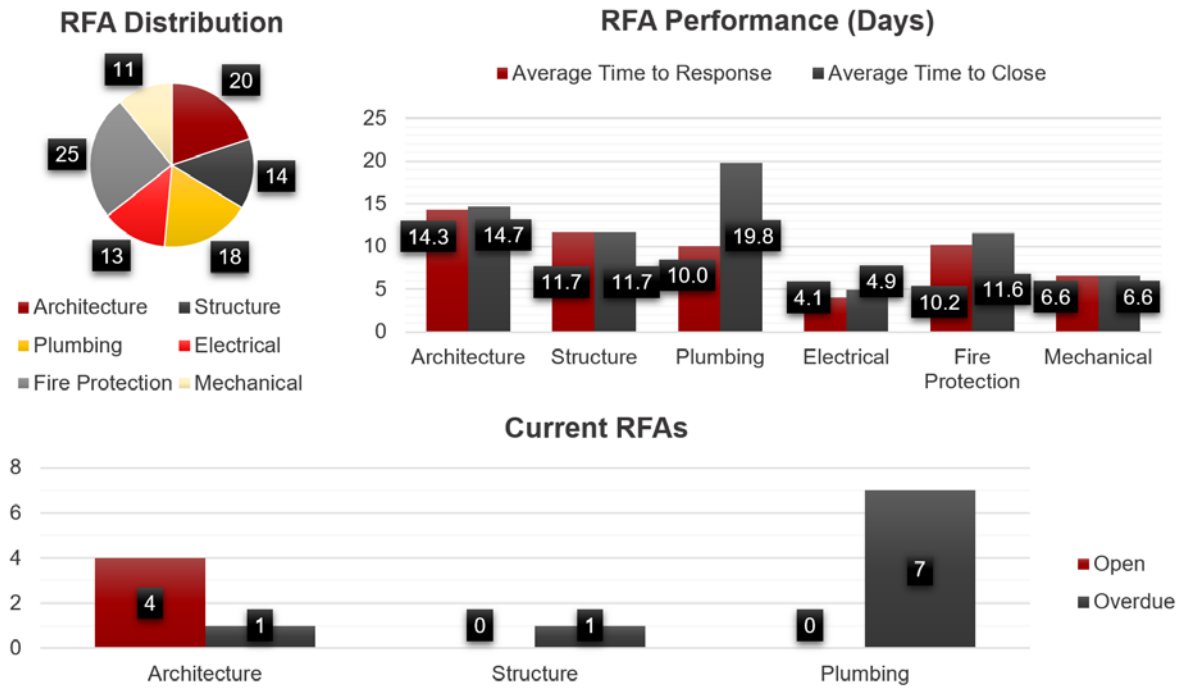


FLOOR PLAN SHOWING A CLASH MARKER IN THE MODEL

At this point a single subscription of Navisworks Manage has been added to provide a more formal final review used to communication coordination results with bidders.

The RFA and RFI process was adjusted so that each RFA and RFI only includes a single issue, allowing for faster returns on individual questions along with better tracking of the statistics of the effort put in by the BIM team.

RFAs and RFIs are created using an excel template that include a data page coordinating the key data so it can be combined (through copy/paste) into a project tracking sheet using Excel providing review listing and project statistics.

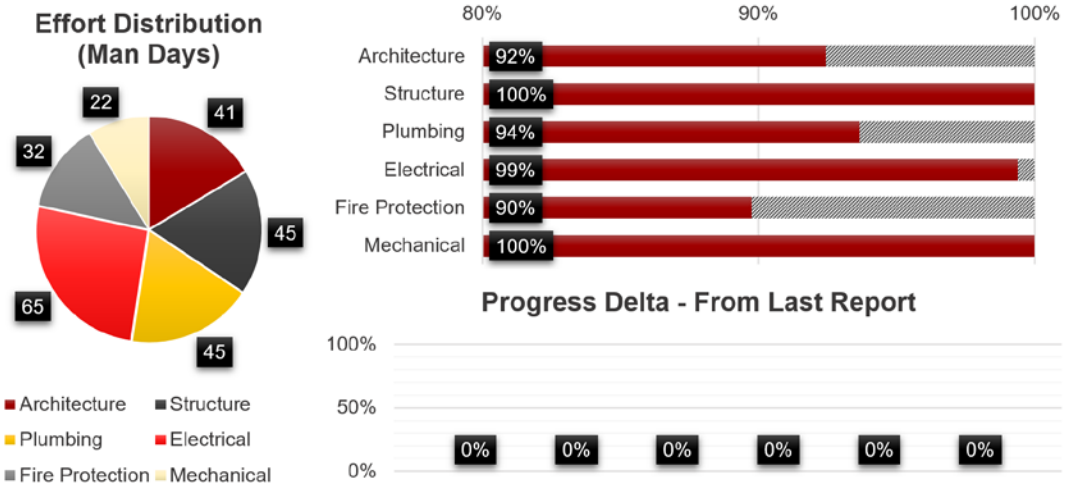


SAMPLE RFA AND RFI STATISTICS

Completion status was very inaccurate with a “test the wind” method of defining completion percentages. This was redefined having each modeler start a project by creating a simple project plan for their modelling effort allowing them to;

1. Better anticipate the work involved and over time improve their project delivery estimates
2. Only need to provide updates on small defined tasks

This task based progress allows the team to provide much better progress updates to the business. This method also allowed for the implantation of warning systems allowing the team to identify if the project deadlines are at risk. Combining this with clash and RFA/RFI statistics allows the organization to better understand and manger consultant performance. As with RFI/RFA tracking this is performed using excel tools.



SAMPLE OF THE PROJECT STATUS REPORTING

Implementing Quantities

The implementation of the quantities system was the most difficult and time consuming stage of the project. A short attempt in using QTO within Navisworks was attempted, but this required the BIM team (made up of somewhat inexperienced graduates) to think both in terms of design and construction, along with thinking like quantity surveyors. It was a step too far for them to deal with. It was clear that another method was required.

Like the overall delivery this went through some requirements definition to help determine the methodology. The requirements were;

- BOQs need to be summarised at different levels of detail;
  - Full detail
  - Overall classification areas
  - Level by level
  - High level summaries
- Available possible technologies are Revit, Navisworks and Excel
- Cost data needs to be incorporated but is not accessible by the BIM team

This led to the general methodology of exporting model data to be coordinated in Excel.

It should be noted here that the methodology for implementing BIM quantities varies greatly between organisations based on business structure, engagement models and implemented staff roles and responsibilities. I point this out in case organisations think to try to replicate what is noted here. This method works in this case because;

- Models are created externally (allowing tighter control and more specific methodology)
- There are no specific quantity measurement roles in the organisation
- Labour is less costly than technology

Where these conditions are not in place it is highly probable that this method would not be effective.

The basic method implemented is;

1. Models are produced and coordinated in Revit
2. Cost Code data is added to model elements to allow them to connect to cost rates
3. Cost Code data is checked through colour coding (where possible)
   a. Using filters
4. Raw quantity data is exported through Revit schedules
   a. Multiple schedules are used
   b. Each schedule must have a consistent format for column data
5. The raw data is pasted to a preformatted Excel sheet
6. This sheet coordinates model quantity data with rates using the cost codes as a reference
7. Pivot tables report the final costing
   a. Allows multiple levels of summarising quantity data.

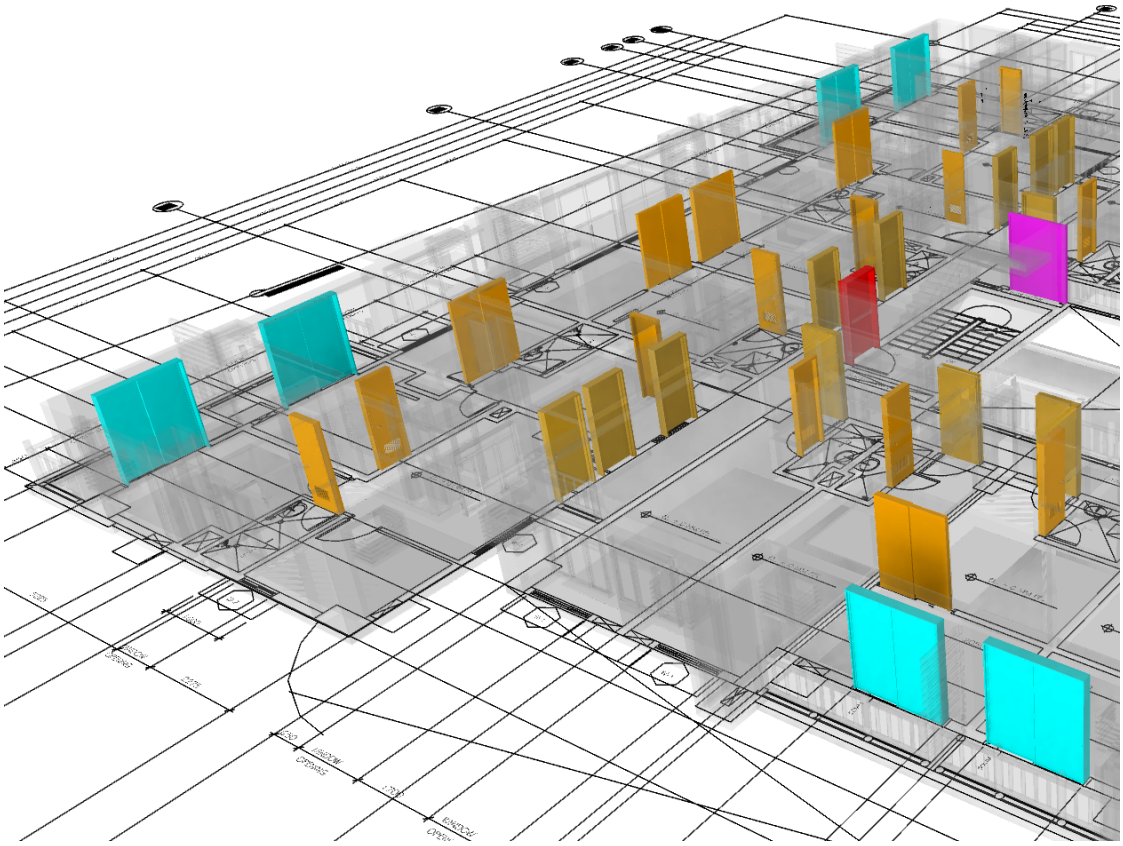
NOTE: Cost codes are a custom classification based on the organisation's original BOQ structure.

There are some key limitations in this method that needed to be overcome;

1. Some required data is not schedulable within Revit by default
   a. E.g. the angle of pipe fittings cannot be scheduled without editing or creating new families
2. Some elements are difficult/impossible to check using colour codes

   a. E.g. materials (paint) cannot be identified by filters
3. Some elements do not have the required quantity data
   a. Material area (paint) of handrails simply does not exist
4. Some elements are very difficult to identify their level, or their Revit level does not match their BOQ level
   a. Pipe insulation is very difficult to identify by level (as it does not have a level parameter)
   b. Sanitary pipes can often register on a level which does not match with their BOQ requirements.
5. Non-modelled items are difficult to quantify
   a. E.g. formwork, there is no easy method to measure formwork area based on model elements.
6. Modelling requirements can require different Revit families to deal with the same element resulting in an inability to use names and descriptions form the model to produce the BOQ.
   a. Wall types including finishes result in many different wall types, but the core construction method needs to be quantified the same.
   b. Naming is attached to cost codes allowing less stringent requirements for model data and easier editing of naming at the BOQ level.

Overcoming these issues took a great deal of effort as each element in the BOQ needed to be reviewed to determine modelling methods, standard data available and any possible custom data of families required to make the quantities system work.



COLOUR CODED MODEL VIEW SHOWING DOOR TYPE COST CODES

The end result however is a very simple and easy to use system them fundamentally automates the quantity measurement system. Additional parameters are either already included in the templates or families, view templates and pre-built schedules ensure that checking and export requirements are covered before the project starts. And the separation of quantity data and cost rates allows the BIM team to hand over a quantity based BOQ to which the procurement team can add and work with cost rates which they have better access to.

Stage 1 – Achieving the goal

Remember that the goal for BIM in this case is impacting project cost through better project budgets, lower contractor risk in fees and smoother construction due to lower design and coordination issues during construction.

This first stage has the organisation finish design; in the same timeline, with a fully coordinated design including construction intent with output quantity data. As the model is coordinated and better reflects what will be built the quantity data provides a better level of accuracy than previous projects.

Additionally, the project tracking statistics provides easy visual information to show both the value that the BIM team is providing as well as allowing the company to better evaluate the results of their design consultants.

HOWEVER, at this point there is still no impact upon the goal, the organisations original plan was to stop here and simply provide contractors with the same information as they would previously receive (i.e. drawings). The issue (as previously noted) is that contractors have little trust in design drawings and only loosely follow them. If this happens then there will be no return form BIM and the goal will not be achieved.

This loose adherence to drawings means that all coordination effort is wasted and the construction team will come out with their own coordination results (in-situ during construction). The construction result will then not match the model meaning the improved accuracy of the quantities does not actually exist.

We worked with the organisation to add some level of BIM into bidding and construction to allow them to achieve their goal.

Stage 2: BIM in bidding

Reducing project cost through lower risk factors in project fees is a much longer term target requiring building trust in both the results of BIM and the efforts of the organisation. In any relationship, the easiest method to build trust is to tell the truth.

In this situation, the way to tell the truth is to let the contractors to see behind the curtain. To drive towards building this trust a BIM in bidding program is currently being implemented which includes;

1. Adding a bidder briefing for BIM describing what BIM is for the organisation and why they are doing it.
2. Walking the bidders through the model showing the level of coordination and the quantities methodology
3. Providing bidders with a copy of the model that they can review themselves to see that there are as far as possible no issues.

As noted this is a very long term situation and is only expected to start seeing results (lowering in contractor rates) after 5 years. Due to this it is still too early to start seeing results as they relate to the BIM goals of the organisation. The response from contractors that have been involved is very positive and eager to try out a project that has had BIM applied to it.

The models that the bidders are provided with are pre-formatted Navisworks NWD files with a time-lock and saving disabled. This time-lock means that at the end of the bidding period they cannot open the model maintaining a core level of ownership with the organisation.

As noted it was not the organisation's intention to roll this out. However, the goal based approach helped them to understand how BIM needed to be used to achieve this goal.

Stage 3: BIM in construction

Right now, the organisation is not focussed on the construction phase of their projects believing that as many of their issues are coming from design that the design phase should be their focus.

Once again the goal based approach allowed us to work with them to see that to achieve their goal they must;

1. Ensure the accuracy of their quantities the building need to be built matching the model
2. To drive an increase in trust with the contractors allowing them to reduce their risk component in their fees they must follow through on the promise of BIM.

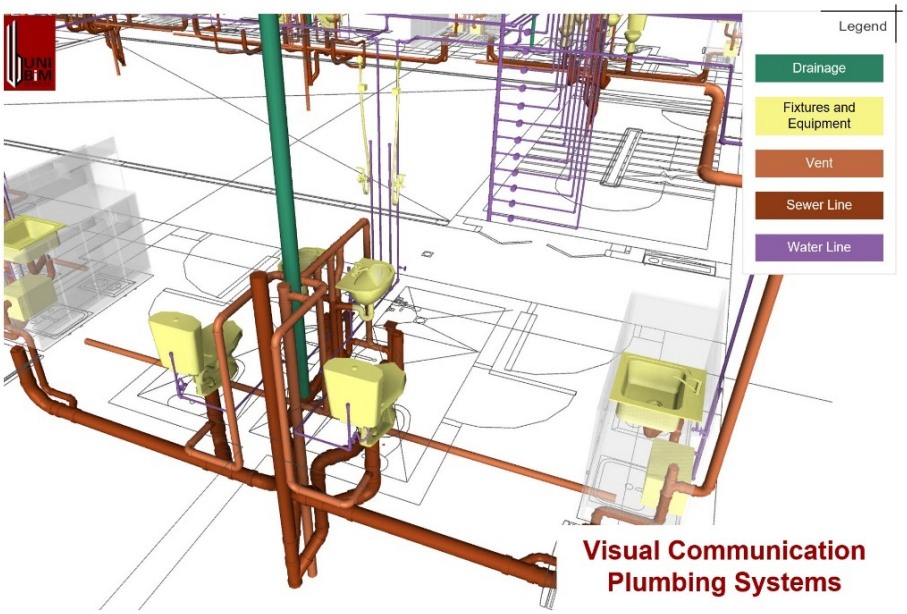
This follow through requires that the contractor builds according to the layout of the model. This ensures that the contractors see the organisation's promises that BIM provides better results is true (building trust) and validates the improved accuracy of the BIM based quantity measurement.

To drive towards meeting the BIM goal we assisted the BIM team to implement a standardised visualisation package that can be rolled out periodically throughout the project. This is based upon the principle;

The first hurdle to getting results from BIM is getting people to look at the model.

This visualisation package involves periodic delivery of a formatted model showing the building colour coded and broken up to provide useful information such as;

- Models broken up by level
- Levels broken up by trade packages
- Construction schedule simulations



VISUAL COMMUNICATION: LEVEL BROKEN UP BY TRADE PACKAGES WITH COLOUR CODING

By taking this model to site meetings the BIM team can ensure that the project team is looking at the model and are seeing it in a format that is easy to understand and reference, thereby making the easiest method to construction to be following the model rather than the easiest method being work it out themselves.

The standards, templates and training for this visualisation has been implemented but their first BIM project is not scheduled to start construction until January, so no results are yet available to share.

Summary

By taking a goal based approach to BIM the organisation was able; with help from their BIM consultant, better understand that processes need to be put in place to see their return from the investment in BIM. For the high-rise residential group they have also overcome their previous false starts as begin to see the results of using BIM.

Part 4: Case study for impacting maintenance through construction

Riverside Medical Center located in Bacolod in the Philippines is a small private hospital with a 30+ year history of supporting the local community with critical health services. Finding that their existing hospital facilities were both aging and reaching capacity they have begun an expansion putting in a new 7 storey wing.

The hospital management identified as a part of planning this new wing, that maintenance issues were a problem with the current facilities. The 3 core issues they faced in the maintenance of the existing facilities were;

1. Data for what is in the facility does not exist.
2. All maintenance methods, history and information was stored in the mind of the recently retired maintenance person.
    a. Who had to be asked back out of retirement to assist the new maintenance personnel understand what is in the building.
3. The layout of the building and its services was not maintenance friendly causing maintenance works to be very disruptive to health care services.

Added to the existing concerns was the worry that delays, typical in Philippines construction would impact the delivery of healthcare services.

Some research by the management team indicated that BIM may be the solution to cover these concerns.

As a hospital it was not feasible for them to set up a permanent BIM group; although throughout the project the hospital team has shown great enthusiasm to get hands on with the models. Their design consultants and contractor did not feel confident of being able to implement BIM. This produced a situation where the BIM consultant would also create the models for the hospital based on the consultant's designs.

The UNIBiM consultant, as per our methodology first detailed the goals for the use of BIM on the project;

- Review the design to ensure that the layout is maintenance friendly
- Minimise construction delays from coordination issues and construction materials

These goals drive how BIM should be used on the project allow teams to remain focussed on project needs.

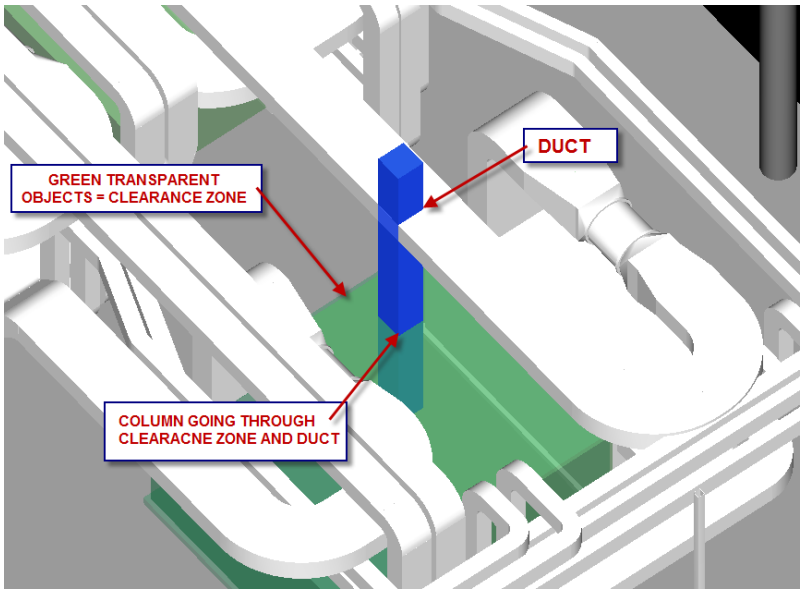
Designed for maintenance

To make sure that maintenance needs are met, the methodology used included;

1. Workshops with the maintenance personnel to understand the typical issues faced in construction
2. Workshops with the hospital staff to understand how maintenance is impacting the delivery of health care services
3. Including maintenance access space as geometry in the models allowing maintenance access to be covered through clash detection protocols.
4. User workshops with the finished model to drive acceptance of the final layout

Including access space as model geometry is a typical method of dealing with access requirements, and user workshops are a typical method employed in healthcare projects.

However, a common limitation in accounting for maintenance requirements within design is access to the people who perform maintenance. The structure of the project provided much easier access to these experts allowing their experience to be incorporated into the final layout.



SAMPLE OF ACCESS SPACE USED IN CLASH DETECTION

Mitigating construction delays

There are 2 main factors that were identified as cause of construction delays;

- Design and coordination issues resulting in rework
- Rework and differences between design and construction layouts affecting material supply

The Philippines is an archipelago of more than 1000 islands, Bacolod is a city on one of the mid sized islands in the southern half of the Philippines. As most major shipping goes through the large northern island of Luzon many construction materials need to be shipped, this can be impacted in the “summer” season were the entire region is impacted by strong tropical storms and typhoons. While good planning can manage these issues for material supply, the impact of construction not matching design and coordination issues driving re-work often leads to a need to order additional materials. Additional material requirements in these islands, particularly during the typhoon season often lead to delays.

To combat these issues several methods were used for the hospital;

1. Managing coordination so that the resultant design is feasible to build
    a. This requires ensuring that typical Philippines construction methods are used
2. Measuring quantities from the model to have quantities matching the expected construction layout
3. Use visual communication through bidding and construction to drive construction to match model.

The coordination was performed by the UNIBiM Consultant on-site with the hospital team at their request after their excitement and enthusiasm for being involved in the design and construction planning

Following the coordination (including maintenance requirements) the model was used for quantity extraction in a method similar to the previously described method.

Providing a coordinated model that accounts for maintenance requirements provides a solid framework from which to begin construction.

Preparing for maintenance

The use of BIM in facilities management has 2 major directions;

- BIM to FM: preparing asset data during construction
- BIM in FM: using the model to provide visual data for FM functions

For Riverside Hospital, the cost of implementing the existing hospital into a BIM FM system is prohibitive so the BIM to FM model is being used. This involves the collection and management of asset data through construction to prepare for facilities management.

Managing construction to match the model layout minimizes issues in developing asset data and as-builts. This allows for a reduction is construction issues (following the layout of the model where coordination is already resolved, also managing material purchasing as materials are “measured” based on the defined layout) thereby providing minimal effort is adjustments for as-built. At the same time tying back to the goal of mitigating construction delays by allowing the team to drive through construction without eating to determine solutions to coordination and design issues.

This phase of the project has only recently started and still to be performed is a review of exactly what asset information is required. Defining this information improves project delivery overall as coordinating this data continues to be a major cost in the life cycle of projects.

Summary

There are several items that help to drive owner/developer returns from BIM. Some of these are region specific and some are universal.

Often we have seen BIM implementations fail but be covered under the excuse “The goal of the project is to produce a building not to produce BIM”. The reason this is an excuse is that the goal of the project was never to delivery BIM, the reason that BIM is implemented is not to result in a building but to impact the ways and costs of the resulting building.

For our residential developer, the result is to improve the speed and results of construction and project budget. For the hospital, the goal of BIM was to mitigate construction delays and ensure maintenance is a factor in the design and construction of the project.

It is these goals that allow the owner/developers to implement BIM methodologies that give them returns, combined with driving BIM beyond design and into construction (still an issue in the ASEAN region).

These are universal issues, across all regions and countries that UNIBiM works in, the lack of a clear goal for the use of BIM impacts the return that owners are achieving.

Region specific issues (tied more directly to emerging markets than south east Asia) are the differences in project cost profiles and general levels of corruption.

As an owner/developer the key then to obtaining return from the implementation of BIM is;

1. Define why you want BIM (or any other change in project methods)
2. Understand what drives the issues that have pushed you to implementing BIM
3. Use these to implement methods that drive towards achieving these goals
4. Be open about what you are trying to achieve.