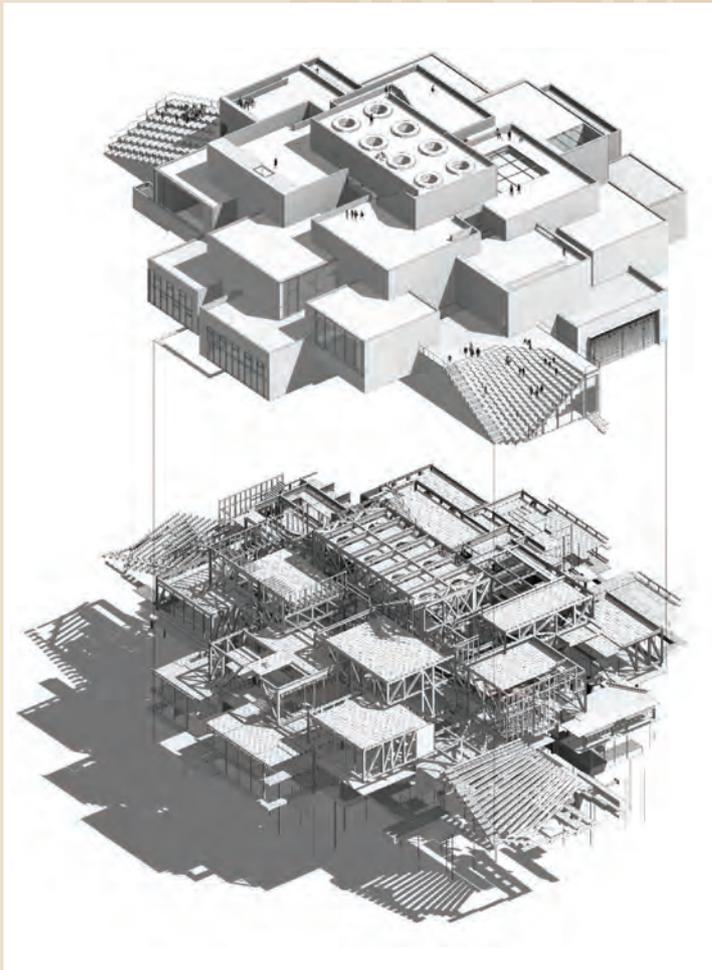


# UNPEELING BIG BIM

Kasper Miller

buildingSMART Korea Employee



<Figure 1> BIG Lego House Project – BIM Model

## UNPEELING BIG BIM

BIG (Bjarke Ingels Group) is a world-renowned Danish architectural practice, internationally recognised for its pioneering, bold and innovative exploration of architectural boundaries. The company's exclusive status as an international "Starchitect" practice attracts clients from across the world, who are willing to entrust the company with a great level of creative freedom (alongside with significant budgets), in return for the promise of being at the receiving end of state-of-the-art architecture. With such great client expectations follow a massive commitment to ensure that each and every building becomes a defining landmark for both the client and the environment it inhabits.

It is exactly this creative and complex variation between projects that make starchitect practices like BIG so intriguing to follow. Every unique design demands a unique approach and strategy, which also translates into the BIM (Building Information Modeling) development. When talking about automation and optimization in a BIM-related context, the more we can repeat and standardise across projects, the more we can generally take advantage of some of BIM. But in firms that work on projects that are not remotely similar or repetitive in nature, such as in the case of BIG, what strategies do they have for BIM?

There is probably no better person to answer this, than Jens Majdal Kaarsholm, who has built an impressive career around establishing such systems in his role as BIM Manager at BIG and former BIM Manager at Foster + Partners. Throughout his career, Jens has led the digital design some of the most prestigious and complex building projects built in modern times.

At buildingSMART Korea, we had the fortunate chance to sit down with Jens and ask him a series of questions regarding his experience as a BIM Manager, as well as his views and recommendations on managing a successful BIM system (Figure 2).

On a day-to-day level, Jens oversees all BIM projects at the BIG headquarters in Copenhagen, Denmark, while also supporting the offices in London & Barcelona. He has left the modelling days behind, as is the case for many BIM Managers in larger practices, where the role is strictly confined to managing company standards, training staff, and providing project consultation and support.



<Figure 2> Jens Majdal Kaarsholm – BIM Manager at BIG

Since returning to Denmark in 2018, Jens has taken a great personal interest in enabling the overall industry advancement of BIM domestically. Through his active engagement as a group user of MOLIO (Danish Building Research Establishment & buildingSMART) and The Digital Task Force at Danske ARK

(Danish Association of Architectural Firms), he has become an essential voice of the industry and a trusted BIM advisor to both the private and public sector. In fact, as a recent recognition of both his career and volunteering efforts, the Danish newspaper, Berlingske, shortlisted Jens as one of the Top 100 Young Talents in Denmark. Through Jens' wide engagement with the industry, both domestically and abroad, he has gained a strong international reputation that most certainly does not fall short of responsibilities.

*“There is not a day where the thought of leaving this industry for good and perhaps becoming a gardener instead does not strike me” – Jens said jokingly, when introducing himself to us.*

At the headquarters of Foster + Partners in London, Jens was one of the key figures in leading the company's transition to Revit. As the BIM Operations Manager, he oversaw all global BIM projects and lead a team of 28 BIM coordinators; a role and a transition which he would go on to successfully repeat at BIG (Figure 3).



<Figure 3> BIG Copenhagen Headquarters

## WITH REVIT UNTIL DEATH DO US PART

When self-reflecting upon his career, Jens explained in honest wording,

*“The fact is that I have made a career out of mastering Revit. I was a part of probably the first wave of students in Denmark, who were being taught extensively in Revit, and I graduated straight into an industry that was ripe for the transition to BIM. That was back in 2012. Everyone wanted BIM and most associated BIM with Revit at the time. Therefore, it became the obvious career path for me, to specialise in the Autodesk’s ecosystem.”*

But despite having clearly benefited from a dependency on Revit, Jens explained that he by no means considers himself a “fanboy” of Revit or a sworn devotee to Autodesk. To prove his point, during the interview Jens expressed his personal support, and welcomed the recent “open letter initiative”, where multiple recognised design firms came together to express their frustration with the direction Autodesk is leading. The criticism was mainly pointed towards Autodesk’s sudden transition to subscription-based licensing, at greatly induced costs to the customers, and the unsatisfactory slow software development of Revit. This open letter spread like a wildfire on social media and eventually had the CEO of Autodesk come out publicly to defend the company.

*“I think the open letter reflects very well on the current frustration that is experienced, particularly within the architectural discipline, regarding Revit not being developed at a satisfactory pace, and in accordance with the industry needs and wants. With that being said, I believe the same applies to competing BIM authoring applications currently available on the market. Each of these applications provides more or less the same services and features, with a few – mostly minor – variations, which ultimately make up the pros and cons of each software, while stirring up a heck of a debate among devoted users.”*

At the current state of BIM software availability, Jens sees absolutely no reason to switch from his application of choice, until something entirely new and game changing disrupts the industry. He did, however, express that he looks very much forward to that day, as it has become evidently clear to him that most modelling programmes are no longer the fresh breath of innovation they once were.



<Figure 4> BIG Lego House Project – Completed

*“I am enthusiastically – if not impatiently – waiting for the next ground-breaking modelling tool to sweep my feet away. I’m putting my money on the young innovators and entrepreneurs, just like the small team of German enthusiasts who seemingly out of nowhere released an inexpensive and ingenious plugin for Revit, which would go on to redefine the whole field of architectural rendering, namely Enscape”. <Figure 4>*

## SETTING STANDARDS STRAIGHT

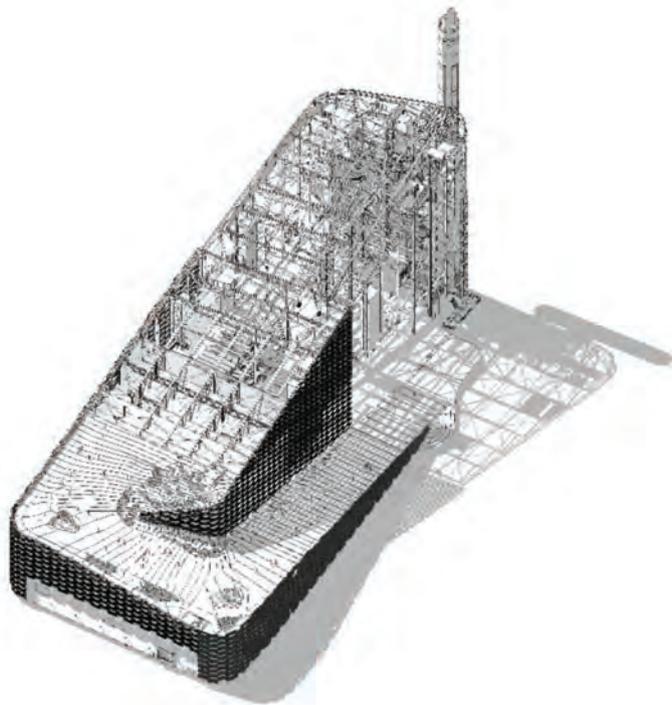
The debate on BIM standards, templates and data exchanges has been raging for decades within the industry. It is not without its merits, because it is an incredibly complicated topic which involves numerous considerations and procedures, each with opinions varying widely between industry experts.

Without diving too much into the specifics of the various standards at hand, we were keen on hearing Jens’ general thoughts on BIM standardisation.

*“At BIG we have one goal and one commitment which ranks above all others. I always make that very clear. That goal is to design incredible buildings. There is no exception, the aim should always be to implement BIM without hindering the design process. As the practice BIM Manager, it is my job and responsibility to ensure that our BIM system is tailored to provide the designers with the*

right tools, workflows, and conditions to optimally support their core function, which is to design great buildings and delivering useful digital asset to our clients. This is a tricky balance of implementing just the right amount of technology to efficiently support the designers, without overwhelming and exhausting them.

I find that it is often the case with BIM that less is more. These days, there is an overwhelming availability of thousands of fantastic tools, plugins, scripts, templates, standards, parametric objects, workflows, etc. Many of which have great potential to benefit the BIM workflows. Exploring and testing these is indeed a true playground for BIM enthusiasts like me. However, as is generally the case with playgrounds, it is easy to get lost in playing. Therefore, I strongly and often remind myself – and my staff – not to redirect focus from the company’s most important goal, which is to support the designers in designing incredible buildings.” <Figure 5>



<Figure 5> BIG Copenhill Project – BIM Model

In extension to Jens’ comment, we asked him what role he thought automation and programming played in BIM,

“For good reasons, the industry is flirting a lot with automation these days – so are we at BIG. But I pay careful attention to ensure that all automation initiatives are thoroughly

assessed and evaluated before proceeding with any development or implementation. The value of automation is obviously undisputable, but sometimes people tend to get lost in trying to do everything better, that they fail to do it at all, or find themselves spending longer time writing up scripts, than it takes to do the job manually. It is true that increased model complexity may unlock more benefits from BIM. However, the more advanced BIM models become, the more fragile they get. If you go to any BIM conference these days, everyone seems to be in race to flash their fanciest renders and most complex scripts, while most avoid showcasing the actual quality of the digital assets that hides underneath the makeup, and those assets are what matters in the end. They are the true value of the BIM model. In my opinion, we must watch out for this flirtation with optimization not becoming blind love. There is most certainly a time and place for allocating resources to optimizing workflows and the industry is inevitably moving towards that direction, which I most certainly welcome with great excitement. More advanced workflows, such as visual programming and scripting allows us to further explore, analyse and innovate architecture and furthermore increase both project speed, accuracy, and quality. But as strong as advanced workflows may be in the hands of the experts, as fragile they can be in the wrong hands. The more dependable BIM projects become on these workflows, the more reliant the projects become on the very few individuals who possess the appropriate skills and know-how.”

As a response to Jens’ comment, we were curious to know, if he thinks it is not merely a question of upskilling employees.

“This issue may very well sound like it could be easily solved by merely upskilling employees, but anyone who has ever worked as BIM Manager understands that training employees is an exceedingly difficult and time-consuming task. Also, it is primarily the young graduates who know how to code. This gives the youngsters an amazing

edge to enter the workforce, but also puts projects at far higher risk for failure, if they are left unsupervised, which unfortunately happens from time to time, in a fast-paced environment like architecture. Also, BIM expertise continues to be in high demand and low supply. Because of that professionals with the appropriate know-how tend to jump between practices a lot. It is unfortunately not straight forward at all. That is why I prefer to keep things as simple as possible, so that everybody is on the same track.

In my career, I have led and trained many BIM coordinators and BIM managers. In this capacity, I have witnessed several cases where projects were either forced on hold or even delayed for days, because crucial elements of the BIM model were heavily relying on scripting, which could only be manipulated by employees that were unavailable at the time. I also continue to see BIM objects that are so advanced and parametrically constrained that no one excepts the creator can figure out how to use them. Cases such as these – just to mention a few – often have detrimental consequences to BIM model health, deadlines, and employee satisfaction. Unfortunately, industry awareness of these consequences tend to be completely overshadowed by the vast automation hype. Therefore, it is so crucial to assess the need for increased model complexity with utmost consideration and care, to minimize unpredictable disruptions and too much expert dependency. It is, for instance, often the case that doing some tasks manually is both faster, easier, and safer than trying to automate them. That being said, I want to make clear that we are strong supporters of automation and scripting at BIG. Due to the complex nature of many of our designs, I believe many projects would have never been realised without these technologies and workflows at hand. Therefore, we continuously allocate vast resources into researching cutting-edge tools and workflows. But we evaluate and implement with care and maintain a rule in the office that no script should depend on just one person.”

According to Jens, there is a clear misconception about the role of BIM Managers, which is seemingly still circulating around the industry and should preferably be dismissed.

“Many still assume that BIM Managers are the single source of highest competency in all BIM-related aspects. A BIM Manager should, of course, possess a high level of knowledge of the applications, standards, contents, and workflows associated with a company’s BIM system. However, mastering a variety of software and tools is not synonymous with being a good BIM

Manager. In fact, fulfilling the role effectively is much more dependent on great communication skills, teaching abilities and project management skills, rather than software prowess.”

We asked Jens, what he thinks has made him a successful BIM Manager, capable of leading highly complex BIM projects for very demanding clients. “I would say that my career has fortunately come to positively reflect on my competency as a BIM Manager and a Revit expert, but I am not shy of admitting, that I by no measure would consider myself a scripting-wizard for instance. In fact, my head is simply not geared for complex scripting. However, what my head is very much geared for and what my experience has taught me, is how to assess complex project scopes and translate them into realistic and bite sized digital deliverables. I have a pretty natural ability to filter out “Nice to haves” from “Needs to have”, which I believe is an essential part of leading a successful BIM project. Thereto, I always keep an optimistic mindset that every situation is solvable if you approach it with a healthy portion of confidence and a collaborative ‘yes-attitude’. Ensuring that this mindset is emphasized on a firm-wide level is of vital importance to project teams’ confidence and success with BIM, I believe.

I prioritize clear and level-headed communication with the project teams above all else and ensure that sufficient time is allocated to training employees. Before my colleagues proceed with undertaking new modelling tasks, I try to always evaluate their competency first. In short, I manage more than I develop.

I usually object to proceed with any development on a project, until everybody on the project team – external and internal – has agreed on a shared strategy for aligning BIM deliverables. This is the part that I am most strict about. It is important to make these deliverables completely transparent to everybody involved – especially the client and the contractors. Far too many times in the past, I have witnessed the consequences of clients and contractors being improperly advised to request BIM deliverables that exceeded both their

*demands and expectations. Therefore, I try to insist on clearly outlining the project requirements together with clients before kickstarting a project.*

*At the end of the day, these digital deliverables are produced for and on behalf of the client, who expects to receive a product in the end, which reflects their requirements for the digital assets. BIM deliverables should never be overshadowed by a perceived desire to do “Better BIM” unless everyone has agreed to pursuing a more ambitious BIM scope. As straightforward as this may sound, I often hear accounts of project teams suffering from fractured communication and unclear goals.”*

We asked Jens, if he could briefly touch on his thoughts on the buildingSMART openBIM standards and the ISO-19650 standards.

*“Here in Denmark, the industry has worked effectively with our widely-adopted national BIM standards for more than a decade. Hereto, workflows evolved around IFC deliverables have been more or less cemented in many practices, since we got the first national BIM mandate for IFC in 2007. Through my employment at Foster + Partners, I also became much engaged with the now superseded PAS-1192 standards (Succeeded by ISO-19650), which I also found to be a robust set of standards,*

*Maybe slightly too robust and overly complicated to my taste.*

*Most standards are generally great standards, if only everybody can agree on using them. Obviously, this is where tricky reality kicks in. The UK has most certainly gone beyond their efforts to ensure that their national PAS and BSI BIM standards transformed into the new international standards. I think the ISO-series are a comprehensive set of standards aimed at standardising absolutely everything, down to the smallest level of detail. I understand the incentive is to nudge the industry into a digital twin future, where all digital assets are meticulously and uniformly defined. However, I am afraid the ISO-series could become a bottleneck on some projects where the requirements for digital assets are still low. We must accept that many clients are still not there yet, and do not want to invest into it. Our core mission is to deliver incredible buildings to our clients and use whatever technology we have at hand to help us achieve this successfully. If clients do not see the benefit of investing in data*



<Figure 3> BIG Copenhagen Headquarters

rich digital assets, I do not see the reason to chuck it down their throats for the sake of satisfying an undesired ambition. Regarding IFC, my relationship is mixed. If there is one thing that IFC has historically struggled with, it is correctly exporting complex geometry from authoring programmes like Revit. Now, complex geometry happens to be one of the most defining factors of many projects I have worked on, hence you might understand my frustration. Fortunately, I have seen great improvements of this conversion issue with the recent release of the IFC4 schema, which supersedes the widely adopted IFC2x3 schema. But most of the industry has not transitioned to IFC4 yet.

Besides that, IFC is unquestionably slow at times, which can be a real pain. I would be lying if I said that it does not make my life a lot easier when everybody just works in Revit. But that is not to say that I am opposed to openBIM. In fact, I strongly support the overall ethos of openBIM. I believe that the longevity, reliability, and quality of a set of IFC data assets make a much more desirable Building Asset Model (BAM) for operational phase than proprietary formats.” <Figure 6>

## WORD OF ADVICE TO KOREAN COMPANIES

In Korea, the road to widespread BIM adoption continuous to be a bumpy ride. As of 2021, it is still far away from being widely adopted, in an industry that heavily relies on 2D CAD deliverables. Even the biggest companies are struggling immensely to adopt BIM successfully on projects. Therefore, we asked Jens, if he could spare some advice for Korean companies that are entering their journey to BIM transitioning.

### 1. Accept the bumps; they will reduce, but never go away

“BIM will be a continuously bumpy ride. Even in BIG we cannot avoid these occasional bumps on the road, and that is despite us having invested in establishing strong company standards and hiring plenty of experts to see the standards through. The projects variables are simply too many and the BIM scene is changing ever so rapidly. But I think it is also important to understand that many of these newfound ‘bumps’ are often mistaken for being a direct consequence of the ‘complicated technology’, when in reality, they are a consequence of traditional workflow inefficiencies and inaccuracies being revealed and thus revised early on in the BIM processes.

In Denmark, I am not aware of an architectural practice which has not adopted BIM yet. Still, we have not achieved a BIM

utopia yet in the country. I still struggle with BIM on occasions, everyone does, but on a domestic industry level, we have come an awfully long way and we are most certainly reaping clear benefits from our investments in BIM.”

### 2. Do not underestimate communication

“In my opinion, the number one obstacle to successful project BIM implementation can be traced back to the initial conversation with the client and the contractor. Even in Denmark, where BIM has been strongly promoted by the government and the designers since 2007, we still struggle immensely with clients lacking BIM know-how. They simply do not know what to expect, what to ask or how to utilize the BIM assets that they request us to develop for them. As a result of this, they are prone to ask for much more than they actually need, while also being easily swayed – typically by external BIM consultants – to request BIM deliverables that exceed their needs. This very pressing issue is the key reason why I have decided to become heavily engaged with the industry on an advisory level. I want to consult and teach the people in charge of making the decisions, to make the right decisions for themselves and for us.”

### 3. Differentiate between BIM Managers, BIM experts and designers

“I have too often come across BIM Managers who possess tremendous technology skills but lacks understanding and experience in assessing the required project deliverables. Sometimes these managers trap themselves in their own competency, by configuring BIM systems that represent their own level of expertise, rather than developing systems that reflect the level of expertise of the firm. It is vital as a BIM Manager to always prioritise the needs and wants of the firm and to ensure that everybody is on track before taking things to the next level. It is more desirable to manage employees who are working comfortably, confidently, and synchronically on BIM deliverables that match their level of expertise, than overwhelming designers with

advanced workflows prematurely. The more overwhelming the BIM system becomes, the more stressed and anxious designers tend to get, which will ultimately disrupt their ability to perform their core function, which is to design incredible buildings on tight deadlines. Anxiety and BIM is not a match made in heaven.

I recommend to gradually advance the BIM system in accordance with employee and firm level. But do not assume you can train employees overnight or by sending them to a 2-day workshop. In fact, I have never seen much value coming from such workshops – but that is a whole other discussion. Companies must accept that learning BIM is a frustratingly slow and continuous learning process that can take anything from months to years depending on the individual. It is not just adapting to a new software, but a complete transformation of traditional workflows. Therefore, I suggest keeping the BIM system as simple as possible until you have cemented the basics, then you can gradually advance.”

#### 4. Establish basic company standards before you begin modeling

“My recommendation to new firms adopting BIM is to really conduct a thorough preliminary study on BIM standards. Before you even open your BIM tool of choice, make a list of everything you want to achieve with BIM. Agree on a firmwide set of drawing standards and symbols beforehand. Use these as references for configuring BIM templates. Also, define how you want different building elements and objects to be represented in 2D and 3D before you start modelling them. Ensure all standard building elements are sketched out by experienced architects / technologists and do not rely on BIM-savvy graduates to make crucial library objects, template settings or modelling decisions without giving them proper feedback and supervision. These graduates often possess amazing abilities, but they lack experience and make many mistakes, as is expected.

If you do not consider company standards from the get-go, it can become a painstakingly difficult task to implement retrospectively. Prevail from overcomplicating BIM systems and deliverables before you truly understand the implications. BIG BIM is the exciting future we are all heading into. But do not forget that our responsibility as architects is it to deliver a great product to our client, physically and digitally, not a prototype. My ending remark to this question leads me to repeat my personal BIM motto once again – BIM should not hinder the design process.

On the top of my head, this is the advice I would give to companies starting on their BIM adventures.” 🌐



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Worked as Head of BIM at an architectural practice in Dublin, Ireland, in which he led the company transition to BIM, trained +40 employees and supported the development of more than 20 medium-large scale projects.