

# Building Information Modeling (BIM) and Legal and Contractual Considerations

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# Background

- **The United States:** Requirement that new buildings designed through GSA's Public Buildings Service use BIM in the design stage effective fiscal year 2007
- **The United Kingdom:** Requirement that all public projects adopt BIM Level 2 (*"involves developing building information in a collaborative 3D environment with data attached, but created in separate discipline models"*) by 2016
- **Denmark:** Requirement to use Information and Communication Technology in government projects in 2013
- **China:** Requirement that government funded projects larger than 20,000 square meters utilize BIM both in design and construction by 2016
- Government and industry organization initiatives in **Singapore, Finland, Australia,** and **Norway** to promote the use of BIM

# Problem Statement and the Purpose

- Legal and contractual issues may be acting as obstacles for BIM's even **wider adoption**
  - Sun et al. (2017): One of the most frequently cited factors for **limiting the application of BIM** is the **legal factors**
  - Jin et al. (2017) identified “More use of **contract language to support BIM** and BIM-based collaboration” as the third most important factor (of fifteen) to **enhance BIM applications**
- Provide an **overview** of the legal and contractual issues associated with BIM
  - **Silo** (or Lonely) BIM vs. **Collaborative** (or Social) BIM

# Roots of BIM's Legal and Contractual Issues

- 1) BIM: A new work process and thus new **risks**
  
- 2) Current Laws → Individualistic **HOWEVER** BIM → Collectivistic
  - Legal systems define **individual rights and responsibilities**
  - Lack of laws to **accommodate the collaboration** needed in BIM
  - Could the lack of specific laws for a collaborative environment lead to **exploitation** by some parties?

# Roots of BIM's Legal and Contractual Issues

- 3) Current standard contracts **allocate responsibilities and risks** among contracting parties for **design** and **construction**
- BIM changes the relationships between parties and results in the **blending/blurring** of their roles and responsibilities
- 4) Lack of precedents (**case law**) → **Uncertainty**



# Issues

- **Ownership and Intellectual Property Issues**
- **Is the model a part of Contract Documents?**
- **Liability and Allocation of Risks**
- Insurance
- Compensation
- **Standard of Care**
- **Reliance**



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# Ownership and Intellectual Property Issues

- Traditional **copyright law** grants ownership to the **creator of the information**
- Complex issue in BIM:
  - A typical final model will have information contributed by **multiple parties** based on each other's information
    - Layers of **Intellectual Property**
  - Who owns what?
- Owners want to treat the model as a deliverable to use it for **facilities management and renovation**

# Ownership and Intellectual Property Issues

- Based on a recent study reporting on **more than 200 projects using BIM** (Pandey et al. 2016), the ownership distribution for the model is:
  - Owner **42 %**, Architect **37%**, Contractor **5 %**, joint ownership **11%**
- According to Chong et al. (2017), the statement that: “**the owner of the model or the client can use, access, and reproduce the model if permission has been sought from the copyright owner**” was one of the legal aspects **highly agreed on** by the survey respondents
- Findings from the interviews in a study done in New Zealand (Ryan et al. 2013):
  - Rigidly guarding IP and copyright somewhat **conflicts** with the ideals of BIM
  - “*Construction creates unique products, they’re individual, and every project is different. So it’s ridiculous consultants trying to protect their IP*”



# Is the model a part of Contract Documents?

- Is the model a part of the '**contract**' or is it a **tool** and **deliverable** required by the contract?
- Is the model for **visualizing the design provided** in the actual contract documents?
- Is the **electronic format admissible** as a valid construction contract document?

# Is the model a part of Contract Documents?

- According to the Chong et al. (2017) study, the statement that BIM's “**digital data/information should be treated as a part of the contract documents**” was one of the legal aspects **highly agreed on** by the survey respondents
- According to the Pandey et al. (2016) study, in:
  - **47 %** of the projects, contracts **included** the model
  - **42 %** of the projects, contracts did **not** include the model
  - 11% of the projects, respondents were **not sure**

# Liability and Allocation of Risks

- Increased **collaboration** among the team members → Traditional **apportioning of liabilities**?
- Contractor assuming design liability?
- Pinpointing **fault**?
  - With **inputs from multiple parties**, can the source of information or **error** be clearly attributed to a specific entity?

# Liability and Allocation of Risks

- Laws require that each project design be under the **responsible charge of a licensed design professionals** to protect public health, safety, and welfare
- **Shared** Professional Design Responsibility?
  - Can the licensed design professionals **be in charge** when many unlicensed participants such as contractors, fabricators, and manufacturers may have access and provide input to a model?

# Liability and Allocation of Risks

- According to the Pandey et al. (2016) study:
  - **Majority** of the contracts was **not clear** about the **design responsibility** and **risk allocation**
- According to the Chong et al. (2017) study, the statement that **“Data providers (designers or contractors) should be responsible and liable for the inserted data in the model”** was one of the legal aspects **highly agreed on** by the survey respondents



# Insurance

- Insurance → **Clear separation of responsibility**
- **Traditional insurance products** used for construction may **not work**
  - Uninsurable professional liability risk
  - Uninsurable general liability risk
- Increase or decrease in **premiums**?
  - A study by Nulton (2013) identified that insurance underwriters are **not** willing to provide **lower rates to companies for using BIM**
  - Small design errors having **significant consequences** if all parties are relying on a shared data set to also contribute to the model
- **Contractor Professional Liability** insurance? General **data loss, theft, or corruption insurance**?

# Insurance

- According to the Pandey et al. (2016) study, of the projects:
  - 42% **did not have additional nonstandard** insurance provisions
  - 11% **had additional provisions** for insurance to cover the liability for modeling errors
  
- According to the Chong et al. (2017) study, the statement that: **“Additional insurance coverages are required to insure all risks and liabilities involved in BIM models, software, and hardware”** was undecided

# Compensation

- The **traditional way of compensating** designers lacks financial incentives for them to implement BIM
- New scales of fees commensurate with BIM design responsibilities **not yet in place**
- Potentially **more risk with no reward**
- According to the Chong et al. (2017) study, the statement that: “**BIM’s cost should be charged according to a fixed percentage of the overall project cost**” was one of the legal aspects **agreed on** by the survey respondents

# BIM in Contracts

- **United States**

- **ConsensusDOCS 301 BIM Addendum** (2008 and revised in 2016)
  - Addendum that can be attached to regular two party contracts such as Owner-General Contractor, Owner-Designer, and General Contractor-Subcontractor agreements.
- **AIA E203 BIM and Digital Data Exhibit** (2013)
  - To be incorporated into the agreement between the parties
  - Used in conjunction with AIA G201 Project Digital Data Protocol Form and AIA G202 Project BIM Protocol Form

- **Canada**

- **IBC100-2014 BIM Contract Appendix** (2014)
  - Appendix to other prime contracts, to define and stipulate the roles and responsibilities of the parties in the use of BIM for their project.
  - Used in conjunction with IBC 201-2014 LOD, Authorized Uses and Model Element Table

# BIM in Contracts

- **United Kingdom**
  - **CIC BIM Protocol** (2013 and revised in 2018)
    - To be incorporated into the contract between the parties
    - Supports BIM working at Level 2
  - **JCT 2016 Suite (2016), NEC4 Suite Option X10 (2017), CIOB Time and Cost Management Contract (2015), PPC2000 BIM Supplement (2013)**
    - Amendments and guidance on incorporating BIM into the contract
    - Provision is made for inclusion of a BIM Protocol
- **FIDIC second edition of the Rainbow Suite (2017)**
  - No BIM-specific terms but an “Advisory Note” for BIM



# BIM in Contracts

- BIM Protocols (Addenda) **vs.** adding BIM-related provisions to existing standard forms of contracts **vs.** brand new contracts with BIM provisions
- According to Chong et al. (2017):
  - **Lack of awareness** of the BIM protocols
  - The use of the standardized BIM protocols remains **low**
- According to the Chong et al. (2017) study the statement
  - **“Specific BIM standard form of contract is required to cover all scopes and project requirements”** was the most agreed on legal aspect
  - **“Addendum is sufficient to cover BIM’s scopes and requirements”** was disagreed

# Another Perspective

- BIM can actually have a **positive effect on claims and disputes**
  - Charehzehi et al. (2017): BIM can be used in **construction conflict management to prevent the disputes**
  - Sun et al. (2017): **Reduction in RFIs and change orders** resulting in up to **40% elimination of unbudgeted change**
  - Fanning et al. (2015): **Reduction in number of RFIs (ranging from 12%-87%)** and **reduction in change orders (ranging from 22%-89%)** when BIM was used for a bridge project
- In a recent survey (Winfield and Rock 2018), only **15% of the respondents** stated that they have been involved in a dispute involving BIM

# Another Perspective

- Only **two known lawsuits** involving BIM to date:
  - 2011, in **the United States** for a building on a university campus
    - The contractor sued the Owner, the Owner sued the Architect and the Architect's insurer sued the MEP Engineer
    - Settled out of court
  - 2017, **in the United Kingdom**, Mid Atlantic Power project in the Falkland Islands
    - Design consultant (appointed as the BIM coordinator) withdrew the engineer's access to the model due to payment disputes
    - The judgment required that the engineer be granted access

# Conclusions

- BIM will likely not reach its full potential without **changing existing legal** and **contractual frameworks**
  - The case study interviews in Ussing et al. (2016) show that when the **legal uncertainty** revolving around BIM gets too much, the parties **go back to traditional methods**
- Efforts by **governments and industry organizations** can promote laws and contract systems which fit BIM better
  - The **combined efforts of the government and the industry in the United Kingdom** for BIM implementation is promoting more **collaborative behaviors** (Winfield and Rock 2018)

# Conclusions

- From a pure contractual point of view, **multi-party contracts** such as IPD and alliance contracting **may align better with BIM**
  - According to the Chong et al. (2017) study, the statement that: **“Use of collaborative project delivery approach is needed in BIM-enabled projects, such as IPD”** was one of the legal aspects **agreed on** by the survey respondents
- According to the Pandey et al. (2016) study:
  - 53% of the projects used **“Design-Bid-Build”**
  - 15% used **“Design-Build”**
  - 23% used **“Construction Management”**



# Recent and Relevant Resources

- **Industry:** “...the aim of this report is to consider the present **understanding of BIM legal and contractual issues among the legal community** and those who instruct them.”
  - 2018 Winfield-Rock Report:Overcoming the Legal and Contractual Barriers of BIM
- **Academic:** “... results identify **21 related contract provisions** that could potentially be used in BIM contracts .... and **develop a contractual framework**”
  - Chong, H., Fan, S., Sutrisna, M., Hdieh, S., Tsai, C. (2017). “Preliminary Contractual Framework for BIM-Enabled Projects” ASCE Journal of Construction Engineering and Management, 143:7.
- **Status in Turkey:** “... Identify a range of **contractual** and **legal issues** concerning the implementation of BIM **in Turkey**”
  - Sozen, Z and Dikbas, A. (2016). “Contractual and Legal Issues for Building Information Modelling in Turkey” Ework and eBusiness in Architecture: ECPPM 2016: Proceedings of the 11th European Conference on Product and Process Modelling (ECPPM 2016), Limassol, Cyprus, 7-9 September 2016
- **Twitter:** Bim4legal: <https://twitter.com/bim4legal?lang=en>

# Quotable Quotes

- “It's all out there about **BIM Level 2** but there's no-one out there that's actually said in a really well put together **document to say that how the BIM process should be put together legally**” (Winfield and Rock 2018)
- “We need to **break down the divide** between the **BIM “tech” people** and **the lawyers.**” (Winfield and Rock 2018)
- “The **better equipped the lawyers are with some technical experience** then the more effective they are going to be“(Winfield and Rock 2018)
- “When there is **good economic conditions** and pressure in the industry there is **not the time to spend in developing BIM expertise**, when there is a **depressed economy** there is **not the money to invest in BIM**” (Hooper and Widen 2015)
- “It is no longer an advantage to know how to do BIM **it is a disadvantage to not know**” (Winfield and Rock 2018)