

Key collaboration **issues** of AEC projects

Even at the smallest scale – AEC projects are endeavors rife with serious collaboration challenges. Successfully completed building projects are the result of the collaboration of different teams of building professionals such as architects, engineers and a general contractor and sub-contractor. These teams more often than not have divergent “trade” priorities and belong to independent organizations with opposing interests.

As a result, these are the **collaboration issues** present in most AEC projects:

- **Lack of real coordination workflow** → parties don't coordinate their work; instead, they only share documentation in progress to show design intent
- **Lost information during data conversion** → native data needs to be converted to open in the other parties' environment for coordination
- **Interpretation issues of data from other party** → data only becomes real information when there is an established workflow for interpretation
- **Limited utilization of building data created by others** → design information created by one trade cannot be integrated into other trades' environments
- **Missing follow-up of design changes between the trades** → coordination is not a one-time data exchange but a continuous bi-directional process
- **Lack of overall coordination environment for multiple trades** → coordination ideally includes all related activities such as collision detection, quantity takeoffs and constructability issues
- **Lack of detailed model for construction** → late coordination and time spent to produce 2D drawings forces construction to be done on sketches/not up-to-date plans

Various **approaches** to address collaboration issues

Sticking to the technical level, coordination between the different trades has gone through a lengthy evolution. Traditionally, different trades submitted full printed documentation sets at the different stages of the design process and used light-tables to try and coordinate the various building structures and building systems. This approach is still popular today with paper's digital equivalents: the 2D DWG and PDF-based collaboration workflows.

With the advent of model based design (BIM), design collaboration entered a new era with the much richer building information model data. With BIM models, demand has increased for true model based collaboration. Two fundamentally different approaches emerged as one known as the “platform” approach where collaboration happens using the different branches of the same

software solution; the other, known as the “open” approach, where different software solutions form the basis of model-based collaboration.

The characteristics of the “traditional” approach

The traditional approach to interdisciplinary collaboration basically means any form of 2D collaboration including paper, DWG or PDF or any other 2D forms. This approach can be characterized as follows:

- **Limited coordination workflow** → the entire workflow relies too much upon manual work and the willingness of cooperation between the parties
- **Heavy conversion of data** → the entire workflow is based upon “dumb” intermediary formats so data conversion results in serious information loss
- **No utilization of others’ data** → due to differences in documentation conventions, the received 2D data cannot be utilized further in a practical manner
- **No comprehensive coordination** → due to the 2D nature of the workflow, the project cannot be coordinated in one integrated environment

The characteristics of the “platform” approach

One of the prominent approaches to model-based (BIM) collaboration is the platform approach where the different branches of the same product family are used to provide binary compatibility. This data-level compatibility on its own may leave serious gaps in the coordination workflow:

- **No data conversion** → this approach offers the strong promise that due to the complete elimination of data conversion, all coordination issues are solved. Unfortunately, regardless of data formats, the different trades have really a different grip on the various building structures, which need to be tackled at the workflow level of coordination
- **Limited utilization of others’ data** → although the platform approach may invoke for a shared BIM model the different trades’ differing requirements, they do not allow such an integrated approach. In this sense, a platform solution does not bring any advantage compared to other solutions
- **Compatibility issues** → for the full utilization of the platform approach, rigorous synchronizations are prerequisite to having all project participants not only on the same platform, but also on the same software version as well. This may easily generate problems if any of the participants belongs to a different organization with independent projects and IT schedules

The characteristics of the “open” approach

The other prominent approach to model based collaboration promotes open collaboration workflows where complex company and project structures are fully appreciated. This approach elevates the conversation from the data level to the workflow level making data what it is: a medium or vehicle of high-level information. With this approach, project participants can be selected based upon their professional expertise and not a particular software being used.

- **System independence** → coming from its name, open workflows provide the different trades with the option to join with the best tools for their own purpose without losing the benefits of model-based collaboration
- **Integrity and ownership of BIM project data** → different trades in the real world are required to maintain ownership and responsibility for their own design data. With open collaboration workflows, this is fully provided as parallel data structures are being developed and coordinated
- **Workflow transparency** → open collaboration requires the workflow compatibility achieved through transparent protocols and interpretation of data to provide an open interface to any solution that decides to connect

The goal of the OPEN BIM movement

The only goal of the OPEN BIM movement is to **promote open collaboration workflows** for better-coordinated projects. This goal is primarily achieved through a globally common, publicly achievable OPEN BIM branding supported with clear definitions, specific requirements and best practices to help implementation.

Who are behind the OPEN BIM movement?

The OPEN BIM movement was launched by two software vendors – **Tekla and GRAPHISOFT** and is supported by various organizations. At the same time, OPEN BIM is not an exclusive club. Instead, it is an inclusive movement welcoming any organization in the AEC industry that is ready to support the overall goals and fulfill the agreed set of requirements.

What does OPEN BIM have to offer to me?

The OPEN BIM movement offers various benefits to the different types of organizations (see below) but provides the following toolkit to anyone joining the movement:

- Clear requirements to fulfill
- Comprehensive guidelines to follow
- Free license to the OPEN BIM branding package
- Voluntary registration for organizations ready to join

Why should my organization join **OPEN BIM**?

Organizations all over the world have been encountering the collaboration issues detailed above. Different collaboration strategies have been used to address them, including in many cases open collaboration workflow. At the same time, open collaboration practices were used more as a necessity in a plural AEC environment rather than an intentional strategy to deliver better-coordinated projects.

The OPEN BIM movement elevates open collaboration to a strategic level where like-minded AEC professionals build upon their plurality to deliver better coordinated building projects, with less errors and in higher quality.

Should you or your organization share these values, joining the OPEN BIM movement not only provides you with guidelines and best practices but also with common branding and international visibility to leverage and maximize the value of your projects. OPEN COLLABORATION → BETTER BIM!

The requirements of joining **OPEN BIM**

The OPEN BIM program welcomes not only software vendors but Organizations and Building Projects of the AEC industry as well. The OPEN BIM™ logo is a guarantee that a software solution, a design or engineering practice or building project fully meets the requirements of open collaboration. Participants in the OPEN BIM Program agree to fully comply with the following requirements respective to its role in the AEC industry:

Software Vendors

- Must be the developer of software that is recognized as contributing to BIM solutions for the AEC Industry
- Must fully support the actual IFC coordination view standard
- Must commit to development of OPEN BIM workflow solutions
- Must publicly endorse superiority of the OPEN BIM approach
- Must promote the OPEN BIM Program in the following ways:
 1. Must have a dedicated section for OPEN BIM on their corporate website
 2. Must publish the official OPEN BIM definition on the front page of this section
 3. Must use the official OPEN BIM logo on each page of this section of the website
 4. Must publish the OPEN BIM program's FAQ document unchanged on this website
 5. If presenting OPEN BIM must use the slides provided in the OPEN BIM presentation template
 6. Must use the official OPEN BIM logo in any communication related to OPEN BIM
 7. May use the OPEN BIM logo on corporate communication templates; in such cases:
 8. Must follow the usage guidelines specified in the OPEN BIM branding package

Organizations in the AEC Industry

- Must be using a software solution from a Software Vendor as defined above
- Must implement full BIM workflow for own project deliverables

- Must commit to implement model-based coordination workflow with other trades regardless of the other parties' BIM software
 1. Must endorse the OPEN BIM concept in local/global community in the following ways:
 2. Must have a dedicated section for OPEN BIM on their company website
 3. Must publish the official OPEN BIM definition on the front page of this section
 4. Must use the official OPEN BIM logo on each page of this section of the website
 5. Must publish the OPEN BIM program's FAQ document unchanged on this website
 6. May use the OPEN BIM logo to promote the project and on company templates; in such cases:
 7. Must follow the usage guidelines specified in the OPEN BIM branding package

Building Projects in the AEC Industry

- Must provide equal opportunity to participate in the project regardless of BIM software used
- Must be delivered using full-fledged BIM workflows throughout the entire AEC process
- Must be fully coordinated using OPEN BIM collaboration workflows throughout the entire AEC process
- May use the OPEN BIM logo to promote the project; in such case:
 1. Must follow the usage guidelines specified in the OPEN BIM branding package

The benefits of OPEN BIM for software vendors

AEC software vendors' primary benefit in joining the OPEN BIM movement is that they can offer their clients open collaboration workflows that provide a competitive advantage on local AEC markets. The OPEN BIM branding guarantees that the solutions developed by participating vendors comply with the OPEN BIM requirements and do not impose unnecessary limitations on AEC practices choosing their software to collaborate with any other practices.

The benefits of OPEN BIM for AEC organizations

In contrast to CLOSED (or "proprietary") BIM the OPEN strategy offers great benefits to building professionals:

- Project members can work with the best-of-breed solution of their respective field without risking exclusion from certain BIM projects.
- Project members can maintain full control over software upgrades independently from their peers in different projects they participate.
- Workflow integration results in greatly reduced coordination errors compared to sheer file compatibility of the different software tools.
- Due to open standards accessibility of BIM data is provided for the entire lifecycle of buildings including construction and operation.

The benefits of **OPEN BIM** for AEC building projects

Building projects themselves are products with their own market. With diminishing differences in building materials and technology, in addition to a building's genuine design, additional labels such as "sustainability" can greatly increase the potential project value on the market. The OPEN BIM movement offers projects a label with very positive associations. Future owners, operators and tenants of such buildings will have better chances to further utilize the digital building model if it was created using the OPEN BIM approach in the first place. This translates to an increased ROI with the continuously elongated building cycles.

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