

RULES FOR SUCCESSFUL INTEGRATED PLANNING AS PART OF BIM

WHITE PAPER

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The digital planning, which can now be found in architecture and design offices, at general contractors or via prefabrication, bricklaying robots and GPS-based excavators already on the building site, is characterized by Building Information Modeling (BIM). Yet, BIM is only really an efficient and commercial option if it is paired with the integrated working method.

Collaboration, close cooperation in the early planning phases and a solution-oriented interaction are the most important aspects in the management of specialist planners, clients, investors or users. A challenge which architecture or design offices can map in an optimal way via an integrated working method. This includes the focus on a few practical planning scenarios, early check of the specific user requirements, economic parameters or constructive challenges – as well as the boosting and expansion of internal professional knowledge and the ongoing training of project staff. Many projects in the infrastructure sector are presently handled integrally and also developed and realized in parallel using the BIM method. In the building construction segment too clients and investors increasingly call for the use of BIM. The added

value of dovetailing the BIM method and integrated planning is obvious: the work of all concerned in an intelligent and always current BIM data model and the cooperation within an integrated planning framework complement one another perfectly. These are not just empty phrases and the white paper demonstrates this fact. Gähler und Partner AG based in Baden/Switzerland is one of the general planning firms that has been a proponent of the integrated working method for many years and takes a comprehensive look at just how it ties in with BIM. The fact is that transparency in planning, solidarity amongst all concerned and eye-level communication, always with the same information, are what guarantee a successful construction project.

**“BIM IS THE LOGICAL
CONTINUATION OF
INTEGRATED PLANNING”**

Raphael Wick,
Chief Executive Officer,
Gähler und Partner AG



Minimizing inefficiencies and potential for errors

In particular, international architecture and engineering offices, general planners or real estate developers are constantly faced with the task of managing complex projects. The multitude of interfaces to the various trades and responsibilities of the individual specialist planners constantly present them with new and major challenges. Plus, there are regional distinctions, language barriers on the building site or national regulations, and none of these elements should be underestimated. In order to avoid the project descending into chaos and the list of interface conflicts escalating, it is necessary to adopt a holistic approach to design and planning.

An holistic approach to planning avoids inefficiencies and minimizes potential for errors. It simplifies the definition of responsibilities – as early as the planning stage and this continues on the building site. What sounds simple in theory is way more complex in practice. For it is necessary to unite various planning partners and integrate them universally and manage them. Consequently, it is up to the architecture or general planning office in charge to formulate their own holistic planning approach: with an interdisciplinary focus as a basis for integrated planning.

Experienced and highly disciplined planners often devise a preferred planning variant, via optimization and evaluation and early in the project flow, which is then pursued rigorously. The definition of important project parameters such as cubic volume, construction, structural system, technical standard or key economic decisions in the planning must, therefore, be taken in an early planning stage. A further benefit of the focus on just one planning variant: the tasks of the individual planning partners can be determined more easily, which simplifies considerably the cooperation of all planners.

> **The interdisciplinary working method means having a multidisciplinary approach in terms of design and response – and if possible developing the optimum solution at the concept stage.**

> **So far important decisions about technical building equipment have only been made in the construction process. Building component – oriented planning and use of BIM tools as well as structures modeled on the computer now require the utmost clarity a lot earlier.**

Necessity and potential of the integrated working method

In the ideal scenario, the integrated planning and working method, therefore, enables an optimized project, in terms of costs, benefit or implementation time. The ideal scenario is not the norm however and the best external specialist planners or one's own experienced employees are often unavailable for the project since they are tied up elsewhere. The skills shortage and the heterogeneous work and training landscape also exacerbate this problem. Whilst at the same time the principals increasingly demand certainties and qualities which can only be mapped with integrated planning and BIM-aided work processes. This is where the challenge lies for many architects, specialist planners or general planners: the complexity of the projects and the demands on them are growing. Consequently, it requires effective management of the project teams and strict organization of the work processes in order to also integrate new employees or inexperienced planning partners successfully into the project organization. Regular meetings are an important tool for this purpose. They take place purposefully with the team leaders and are conducive to process control, cost and resource management and in particular the holistic, systematic development of the project, thanks to consistent data models used by all participants.

> **At present, the infrastructure sector in particular benefits from BIM as well as building construction: bridges, roads and tunnels can be modeled digitally and enable a precise simulation of the construction process, and map and coordinate in a detailed way schedules and the interfaces and handovers to subsequent trades.**

Identifying competitive benefits with BIM

A working method which systematically embeds the aforesaid optimizations in the project and planning partners who adhere to them and stand together in the project constitute a key factor in the success of every construction project. Collaboration and clear definition of interfaces are also supported by the BIM process. BIM thus supports the logical continuation of integrated planning via consistent data models. Efficiency, cost certainty, cost awareness and optimized planning efforts and an optimized planning process are important for an efficient office and the client. Naming these qualities as a valuable service and positioning with the principal of one's own output as exceptional added value is a clear competitive benefit in a heterogeneous European planning landscape.

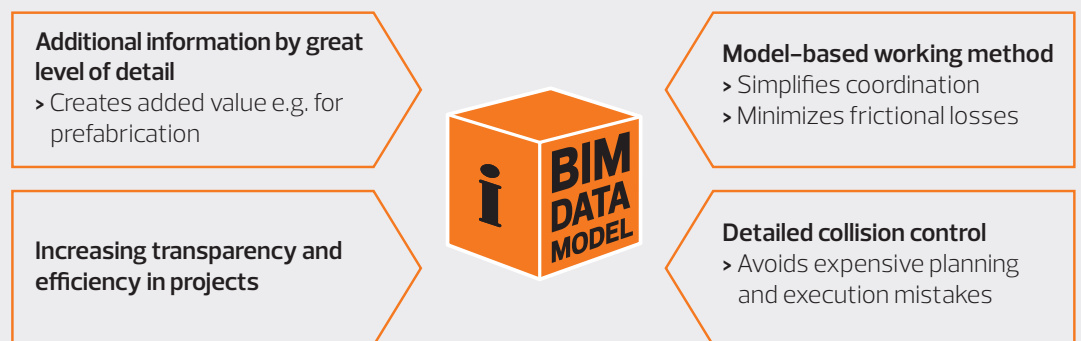
Making decisions, conveying planning reliability

The BIM model requires information, structure, clarity and consistency. The important and cost-relevant decisions for construction, materials and technical building equipment must, therefore, be made by the architect and specialist planner or general planner, principal or client at the start of the planning process. This requires clarity in terms of desires, requirements and demands on the structure to be constructed. The architect, engineer or specialist planner becomes the coach, psychologist, project manager and trustee of a client who is on occasion overstretched. For the latter also needs to learn that they shall support the successful planning process through cooperation and statement of their needs and requests.

A paradigm shift if one considers the development of the history of architecture: for centuries, important decisions concerning the technical building equipment were only made in the construction process. Building component-oriented planning and use of BIM tools as well as buildings modeled on the computer now require the utmost clarity a lot earlier. But they also make it possible to take a virtual reality tour of the building – long before the first ground is broken. And thus align the planning and the principal's request and also take into account the needs of Facility Management

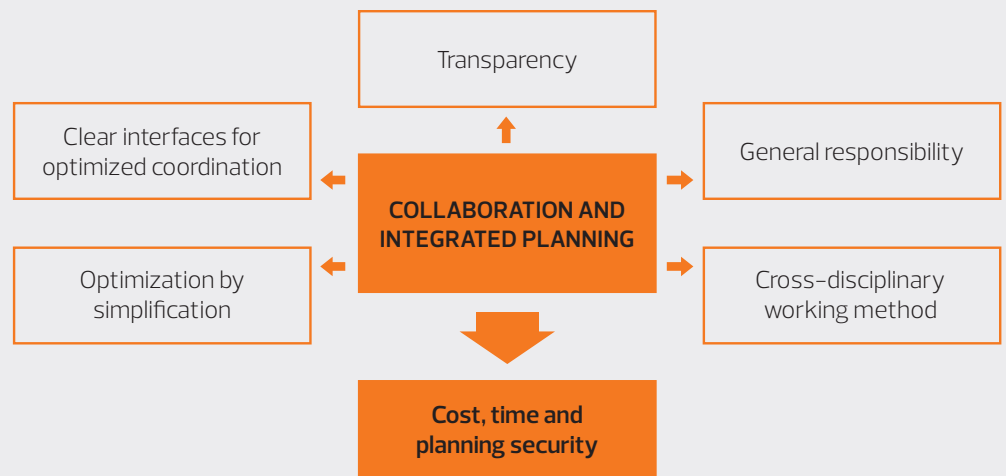
IMPORTANCE OF BIM-AIDED DESIGN

The 3D data model creates added value for integrated planning.



INTEGRATED PLANNING AS APPROACH TO SUCCESS

In the interplay between the various parameters integrated planning and collaboration are the focus



early on. The use of the BIM method consequently signifies a complex and far lengthier pre-planning phase in the project – however, benefiting high planning reliability and risk minimization for the architect or general planner and client: provided no excavator moves any earth, reasonable planning modifications are possible. Ultimately, this results in an optimized project in terms of costs, benefit and implementation.

Significance of the model-oriented BIM for the planner

Also for offices which come into contact with BIM for the first time and contemplate personal value creation in the planning process, the added value quickly becomes clear: the model-based working method helps to reduce potential for errors. The work in a shared data model provides the option for an early, consistent collision check. The supplementary information which enhances the model during the project provides added value. The data models can be used for prefabrication processes or for the subsequent building operation in a reworked data model for the Facility Management.

In addition to building engineering the infrastructure sector also benefits from BIM. Today tunnel constructions, for example, can be modeled digitally, the construction process simulated

exactly, the building site progress scheduled reliably and the interfaces and connection points for subsequent trades mapped three- dimensionally and coordinated in detail. With the complexity of such transport structures and the immense costs that they gobble up during the construction and in particular in operation, BIM is the planning method of the future and digital planning with all its many elements is the key to cost-optimized projects in road construction, bridge construction or tunnel building.

Developing competences and nurturing expertise

It is almost a truism: a key success factor for every subsequent project is the comprehensive documentation of the previous contract. Added to this, there is the training of employees and development of own internal competences in case of complex planning. Applied to the BIM planning process architects and planners must alter their current work processes, develop internal expertise and train their own staff. Reliable external consulting, mentoring and support is certainly helpful for the transfer of competences and refinement of the necessary skills. The change to the value-creating use of the BIM method must be done carefully. In every design or architecture office the hard and abrupt changeover of work and planning processes would paralyze teams and delay massively current projects. It is advisable in

any case to focus one BIM officer in the firm on the topic – and only this. In addition, having successfully prepared the BIM processes, implementation of the ensuing workflow processes and the comprehensive training of project participants an initial small test project should be worked on. The BIM coordinator then leads the team through the entire planning process, gives care and advice in the event of problems and is responsible for the comprehensive project documentation.

employee by the management. BIM thus becomes a management decision.

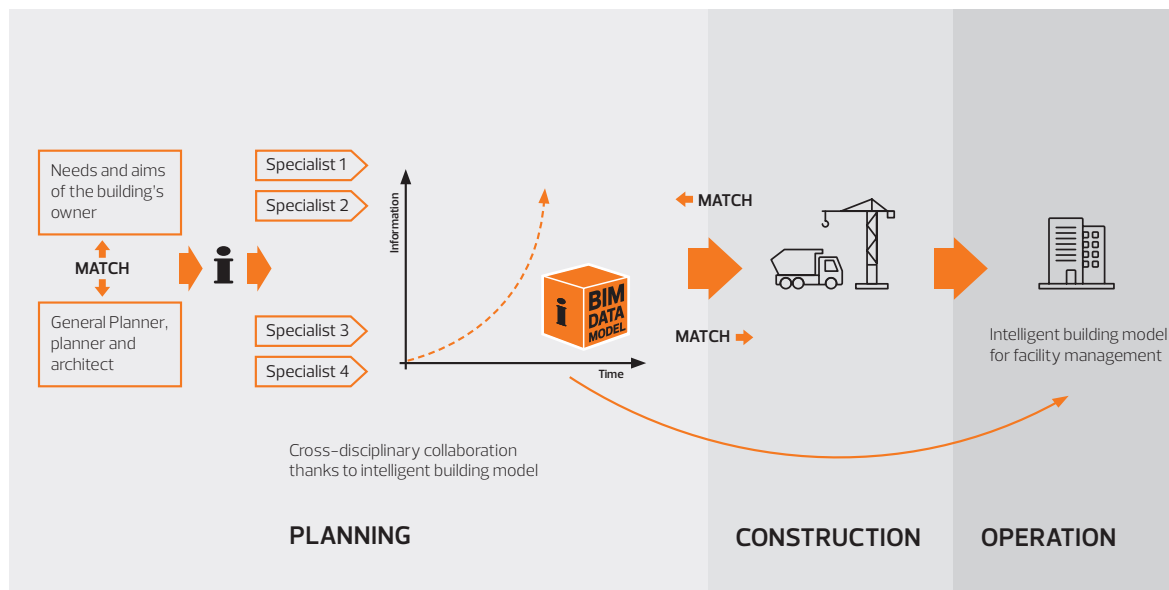
> **BIM is a management decision which affects all stakeholders: company's own office staff, specialist planners and building product manufacturers as well as building firms, clients or investors.**

BIM is clearly a management decision

Building Information Modeling, therefore, signifies a major intervention into the existing office structure and the work processes. It is important to take on board the following: BIM is not a temporary phenomenon, not a fashion. BIM is, in fact, a paradigm shift on the way to digital design, construction and management. The market already requires BIM-aided planning services in sub-areas (e.g. in infrastructure planning). In a foreseeable time horizon of likely 5 to 10 years medium-sized construction tasks and major projects will generally be awarded and managed on BIM standard and based on modeling. Architects, general planners and highly disciplined specialist planners must face the associated challenges, which means in particular the change to internal office processes and workflows. Such a pivotal reorientation must be brought to the attention of the teams and every

INTELLIGENT PLANNING WITH BIM

The enhancement of the BIM data model with information and by all participants demonstrates a clear benefit – not only for the planning and the building stage but also, for example, additionally for the operating stage of the structure.



Conclusion

Collaboration and interdisciplinary working method, integrated planning and Building Information Modeling dovetail perfectly. However, a joint focus on a workable planning approach and the early formulation of detailed design parameters remain important. This creates clarity in the definition of responsibilities and simplifies interfaces. And BIM helps to minimize planning efforts and achieve cost reliability, planning security and schedule reliability at the client and planner. This makes the method a tool which helps in the interdependence of integrated planning and digital model to secure new business areas and also safeguard and expand one's own position in the current project environment. Architects and general planners, specialist planners or construction firms structured in this way position themselves sustainably as important and competent contact partners for their clients, investors and expert colleagues.

Background information

This white paper is based on an in-depth discussion with the Chief Executive Officer of Gähler und Partner AG based in Ennetbaden in Switzerland, Mr Raphael Wick, who provides a comprehensive insight into the planning philosophy and features of integrated working. Gähler und Partner is a highly specialized firm with over 100 years of planning and construction experience. Today its competences lie in structural and civil engineering, road and railway line construction, in project management and in real

estate development, amongst others. For example, the firm was involved in the design of the Gotthard Base Tunnel which was opened in June 2016. Gähler und Partner is an integrally operating general planning firm with more than 100 employees for whom the integrated planning and BIM are an important tool for project success and satisfaction of involved specialist planners, construction companies and clients.

ABOUT THE COMPANY

ALLPLAN is a leading European vendor of open solutions for Building Information Modeling (BIM). For more than 50 years, the company has supported the construction industry with a pioneering software portfolio and is playing

a key role in promoting the digitalization of the construction industry: innovative, geared to the requirements of customers – and with best quality "Made in Germany".