

Graphisoft's Virtual Construction Solution

What is the innovation?

The Graphisoft® Virtual Construction™ Solution, the first commercially available 5D construction management system, allows construction professionals to plan projects in 5D, uniquely combining 3D modeling with time and cost. The new product line consists of Graphisoft Constructor, Graphisoft Estimator and Graphisoft Construction Management Services.

Why is it innovative?

Graphisoft's Virtual Construction Solution is the first product designed to reduce the cost of building projects and identify constructability issues during the design and preconstruction phases – ultimately transforming the whole construction planning process. Graphisoft's new solution enables construction companies to win more business by reducing the time required to produce estimates, and lowering the cost of creating those estimates – giving companies and contractors the opportunity to submit more bids. The cost and schedule simulation feature also produces detailed presentations to boost owner confidence that projects will be delivered both on time and on budget. In addition, the Virtual Construction solution assures both contractors and owners of the accuracy of an estimate and visualizes and shows the cost implications of the alternative schedule evaluations offered by construction models. Predictability is also greatly enhanced by synchronizing any change in a project's design, cost or schedule.

What did the innovation change or replace?

Previously, general contractors relied upon 2D working drawings of the construction design and were unable to visualize the structure in 3D. This meant that construction errors would only be picked up and addressed at a later stage during construction – with the remedial work at this advanced stage adding massively to the cost. Also, the scheduling of work phases were not efficiently coordinated, adding to the notorious scale of 'waste' in terms of time, resources and man-hours in the construction sector. Additionally, the necessary manual elements in the procedures increased the likelihood of errors and confusion. Graphisoft's Virtual Construction Solution is the first offering of its kind and fulfills a true need in the construction market by delivering the advanced technology and related services that support the real-world needs of construction and design-build professionals.

Where and when it originated, has been used, and is expected to be used in the future?

Graphisoft's Virtual Construction solution is based on six years of research, development and production by the YIT Corporation, based in Finland. Upon acquisition of this set of applications and services, Graphisoft further developed and honed them for the larger construction industry by working closely, over the last 18 months, with key customers, including California-based Webcor Builders and Finnish YIT Construction – a subsidiary of the YIT Corporation. The 3D modeling solution used to virtually construct projects was announced by Graphisoft Headquarters, Budapest, Hungary, in October 2004.

The anticipated growth in 3D modeling in the construction industry will create a need for a new breed of professionals; construction modelers. By extracting the data inherent in every Virtual Construction model, these professionals will offer constructability analyses, more accurate estimates and the optimization of sequencing and procurement. More importantly, the fruits of their labor will be an overall reduction in project costs expected to be about 2-3 percent, plus the potential for further savings via the streamlining of project schedules.

If the nomination is for an innovative project, specifically identify each of its innovations.

Graphisoft Constructor includes:

- A Construction modeling system designed to create accurate 3D construction models quickly. The resulting model reduces errors present in design documents, leading to significant savings in construction cost and time.
- A 4D sequencer that automatically links the construction model to the project schedule. Once linked, schedule alternatives can be more effectively evaluated and shared.
- Graphisoft Estimator Connector extracts, links and publishes model information to/from Graphisoft Estimator.

Graphisoft Estimator includes:

- A model-based estimating system designed to extract accurate quantity information from the construction model and produce estimates more quickly and accurately.
- A traditional estimating system to support the transition from manual takeoff-based estimating to model-based estimating.
- A production, planning and procurement capability that divides the resources created by the estimating application into production zones and helps to produce procurement requirements.
- 5D reporting capabilities using the construction model as the link between cost and time. The system produces cost-loaded schedules for financial analysis.

Graphisoft's Construction Management Services suite delivers to construction professionals the tools necessary to support the construction planning, estimating and scheduling processes.

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