CADD CENTRE
www.caddcentre.ws

Please send your feedback to the Editor - Ms. P. Malarvizhi, Manager - International Business & Corporate Communications, CCTS at p.malarvizhi@caddcentre.ws

Graphic Designer - R. Rajakumar, Senior Graphic Designer ■ CADD Centre and CADD Centre logo are registered trademarks of CADD Centre Training Services Pvt Limited. ■ All the above mentioned brand names and trademarks belong to respective owners & acknowledged. ■ CADD ZOOM is an internal monthly newsletter of CADD Centre Training Services. For free circulation to its employees & customers!

Corporate Office: #91, Dr. Radhakrishnan Salai, Gee Gee Crystal, 8th Floor, Mylapore, Chennai - 600 004. Ph: (91 44) 4596 6100.

CADD CENTRE
Driving Digital Designs!

CADDZOOM
MONTHLY NEWSLETTER
your CAD / CAM highway

VOLUME -10
ISSUE - 4
JULY 2014

Featured INSIDE

BIM Technology:
Intelligently Linking Drawing and Database

Twenty five years ago, nearly every drawing produced in the world was done with pencil or ink on paper. Minor changes meant erasing and redrawing while major changes often meant recreating the drawing from the scratch. If a change to one drawing affected other documents you were dependent upon having someone manually recognize the need to make the changes to the other drawings and to do so.

However, Computer Aided Design (CAD) has fundamentally changed the way design is done. Architectural practice continues to be increasingly influenced by and dependent on computer technology. The latest evolution of CAD in architecture is Building Information Modelling (BIM) technology that has disrupted traditional methods of representation and collaboration in architecture.

BIM is one of the most promising developments in the architecture, engineering, and construction industries. With BIM technology, an accurate virtual model of a building is constructed digitally. When completed, the computer generated model contains precise geometry and relevant data needed to support the construction, fabrication, and procurement activities needed to realize the building.

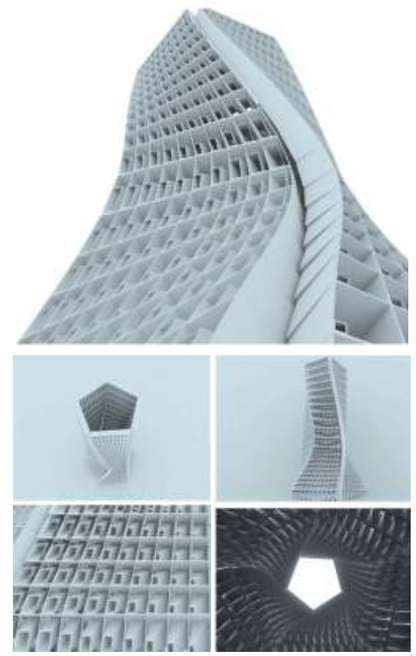
BIM is born out of parametric design and relational database concepts. Ultimately, BIM leverages these two concepts to intelligently link drawing and data, and let the users see buildings through the lens of a database.

To get an idea of how BIM works, we should know what is parametric design and relational database.

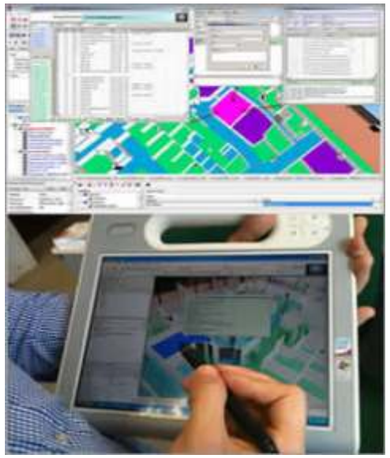
Parametric Design

Parametric design is a process used to manipulate, regenerate and design objects based on a set of rules or parameters.

Original CAD software used explicit, coordinate-based geometry to create architectural graphic entities such as a wall or hole. Editing these "dumb graphics" was cumbersome and extremely error prone. Then came parametric modeling software - they used parameters (numbers or characteristics) to determine the behavior of a



graphical entity. For example, parameters can be defined such as: "the diameter of this hole is 1 inch" or "the center of this hole is midway between these edges."



One way to understand BIM is that it enables users to tie their drawings with numbers or characteristics – or simply data or information. Is that all? No! BIM ties drawing with database – a relational database.

Relational Database

A relational database is a method of structuring data as collections of tables that are logically associated to each other by shared attributes.

Databases have been a staple of business computing from the very beginning of digital era. You may know how to create a table with columns and rows in MS Excel or MS Word and store information in appropriate places in the table. How about creating a table that has a minimum of thousands of tables? And then let one table talk to another table or one column of a table talk to another column of a table!

Here is an analogy: you can compare tables to houses in a colony. Assume that each house is linked in some way and the kitchen of a house can talk to the kitchen of another house – that is make use of utensils and food materials of the kitchen of another house. Now you get the picture, right?

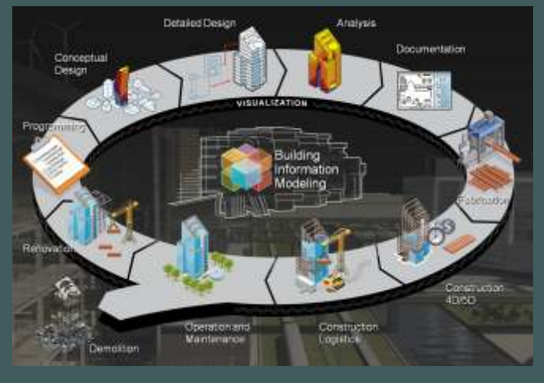
In relational database tables and their components are linked to those of others and information can be stored and retrieved among all the tables.

The BIM technology lets users to design architectural graphic entities using parameters and lets the information of these entities stores as data using organized tables. Every element in a BIM model comes with editable attributes that are stored as data in a table.

Benefits

BIM allow architects, owners and other design professionals to have ready access to an ever-increasing body of information or data from which to make decisions.

BIM changes the way companies work - both internally and externally. Projects have become more and more complex, requiring firms to manage and share immense amounts of data across diverse and distributed teams. By enabling greater insight into the project at any point in its lifecycle, BIM helps AEC service providers to improve accuracy, efficiency, and productivity, resulting in time and cost savings.



The significant value-added benefits that BIM ready firms can provide include: faster project approvals, more predictable outcomes, sustainable design and analysis services, and improved collaboration and information sharing for integrated project delivery strategies.

The increased potential for collaboration that comes with BIM can have a great impact on your business models, the types of projects on which you bid, and the partners, clients, and consultants with whom you choose to work. The ability to digitally collaborate on a building's physical and functional characteristics strengthens and deepens existing partnerships — and forges new ones between architects, engineers, contractors, and owners.

BIM allows us to work on much more complicated structural engineering projects than were attempted in the past. Architects are using more and more complicated geometries. BIM allows us to share the geometries back and forth among the design team members much more easily.

The ramifications of that new level of collaboration are felt across all the organizations involved in a project, reaching far beyond the design groups and affecting most aspects of each firm's business.

BIM can also affect the way a company delivers its products, enabling AEC service providers to deliver more 3D views, sections, schedules, and realistic renderings in construction documents. BIM also improves the quality of the final product.

Conclusion

Implementing BIM will result in changes to your design process, drawing production, and project team organization. Perhaps the biggest process change that firms encounter has to do with the very act of designing. Design representations are no longer 2D drawings. Instead, designers are using 3D digital models that are assembled in the same way a building is constructed. The ability to look at all these aspects together in a holistic manner is of tremendous value.

The use of BIM tools is increasing the level of effort during early design and also speeds up your backend production processes. More importantly, results in a higher quality, more sustainable building with fewer requests for information and construction change orders.

CADDZOOM | July 2014

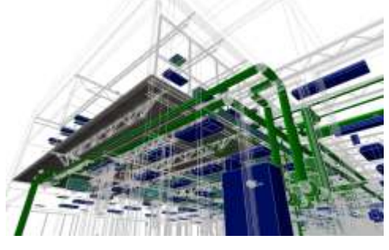
Revit Architecture 2014:
Instant Revisions Made Possible

Revit stands for Revise Instantly – representing a software system that automatically updates a change made in one view in all other views and schedules. A major goal of Revit software from Autodesk is to eliminate much of the repetitive and mundane tasks traditionally associated with CAD programs allowing more time for design, coordination and visualization.

Revit utilizes a parametric model (3D based) to generate plans, sections, elevations, perspectives, details and schedules - all of the necessary instruments to document the design of a building. Drawings created using Revit are not a collection of 2D lines and shapes that represent a building. Instead, they are live views extracted from what is essentially a virtual building model.

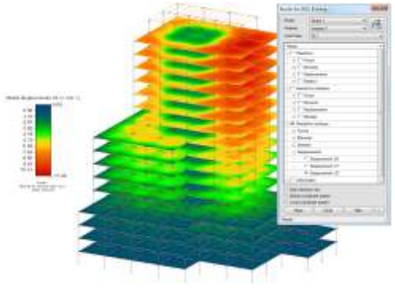
The best way to understand how a parametric model works is to describe the Revit project file. A single Revit file contains your entire building project. Even though you mostly draw in 2D views, you are actually drawing in 3D. In fact, the entire building project is a 3D model. From this 3D model you can generate 2D elevations, 2D sections and perspective views. Revit comes in three different flavors: Revit Architecture, Revit Structure and Revit MEP (which stands for Mechanical, Electrical, and Plumbing).

Design: Revit is 4D BIM capable with tools to plan and track various stages in the building's lifecycle, from concept to construction and later demolition. Using Revit, you can design a building and structure and its components in 3D, annotate the model with 2D drafting elements and access building information from the building models database.



A building model in Revit consists of intelligent components that contain not only physical attributes but also functional behavior familiar in architectural design, engineering and construction. All design elements in Revit share a level of bidirectional associativity - that is, if elements are changed in one place within the model, those changes are visible in all the other views. For example, if you move a door in plan, that door is moved in all of the elevations, sections, perspectives, and so on in which it is visible.

Many architectural designs are too complex to be accomplished using a conventional method like designing it going by the floor plan. Using Revit you can create building concepts before actually creating building elements. Sketch freely and create free-form models



Analysis: Energy Analysis for Revit software is a cloud-based energy simulation service powered by Green Building Studio that supports sustainable design. You can do the structural analysis of calculating the effects of loads on physical structures and their components with Revit effectively. The software comes with cloud-based Structural Analysis software that supports building structural analysis as part of the BIM process. Revit software works the way architects and designers think, so you can develop higher-quality, more accurate architectural designs. View features to see how you can use architecture design tools built to support BIM workflows.

Documentation and Reports: Creating documentation using BIM gives you the added advantage of being able to visualize the project in 3D. You can create a seemingly unlimited number of interior and exterior visualizations. Customers can virtually walk through the building at their own pace, exploring an endless variety of directions. You can use Revit also to instantaneously generate reports on component quantities and space usage, whereas plans, sections, and elevations afford you the flexibility to customize their display using the information embedded in the modeled elements.

Autodesk Revit is widely used by architects, structural engineers, MEP engineers, designers and contractors.