

Topic:  
CAD & AEC

## New Opportunities for CAD Vendors in the AEC Conceptual Design Market

by Marek Villermann, The Business Advantage Group

**Highlights from the recent survey by the Business Advantage Group – read about the rise in demand for the Conceptual Design phase of a project to be better supported by CAD tools.**

### Article Highlights:

- The conceptual design phase is not well supported by current tools
- Vendors are now more intensely targeting the AEC conceptual design market
- An ideal BIM integrated conceptual 3D modelling solution may be on the horizon

“Current CAD tools are not able to support the conceptual design phase, and none of them provides a consistency analysis for sketches produced by architects. This phase is fundamental and crucial for the whole design and construction process of a building”

*(Bodo Kraft and Manfred Nagl)*

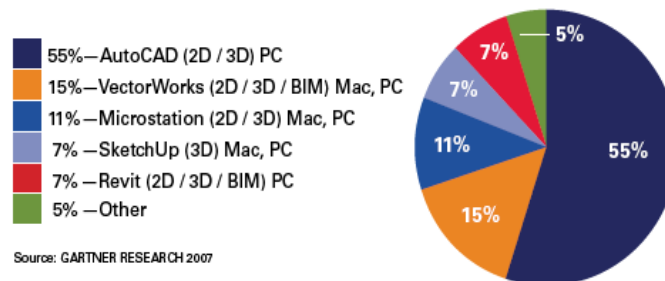
*iCAD is produced by Business Advantage, a B2B research, business development and marketing consulting practice operating in the global IT, Digital and Telecommunication sectors.*

### Competitive Environment

The AEC conceptual design software market in the US and Europe is considered fragmented, with low multi-vendor activity and insufficient software functionality.

Currently there is no single leading CAD conceptual design tool appearing in the market. AutoCAD dominates AEC software market, but has functions for detailed design which are not necessary in early design stages, and is therefore functionally over weighted.

As a single conceptual modelling tool non-CAD Google SketchUp now leads the architecture market, and is also used in alternative segments. However SketchUp is not considered a suitable vertical application for architects or engineers use in their design process due to its limited capabilities.



Since the recent acquisition by Google, SketchUp solution is amongst leading AEC software packages developed both for conceptual and detailed design. In 2007 SketchUp rapidly gained 7% of AEC market share, according to Gartner Research, and is predominantly used for conceptual design.

“Architects are the core market of SketchUp and constitute 3/4 of its AEC users”

*(Google SketchUp, Product Manager)*

According to the latest survey conducted by Business Advantage, design architecture groups are the largest user groups of SketchUp.

Apart from AutoCAD and SketchUp other CAD tools have significantly smaller conceptual design market share and are presented by numerous 2D CAD, 3D modellers and project management tools, which are common at both conceptual and detailed design stages.

### **Market Approaches**

The innovative combination of a 3D modelling tool with a GIS addition enabled user friendly SketchUp to achieve a significant AEC market share. Rapid penetration of SketchUp shows that the AEC market is ready to adopt a new conceptual design tool and there is immense potential for it.

The AEC conceptual design market is now increasingly considered by many vendors as being attractive; leading jewellery and yacht design software vendor McNeel consider the AEC conceptual design market as a new growing segment for their Rhino product, however Rhino is not traditionally positioned as a pure conceptual design application.

“The product has not really changed to suit architects. Rhino came into the architectural space supporting the marine industry originally, with very similar problems to architects”

*(McNeel Sales Manager)*

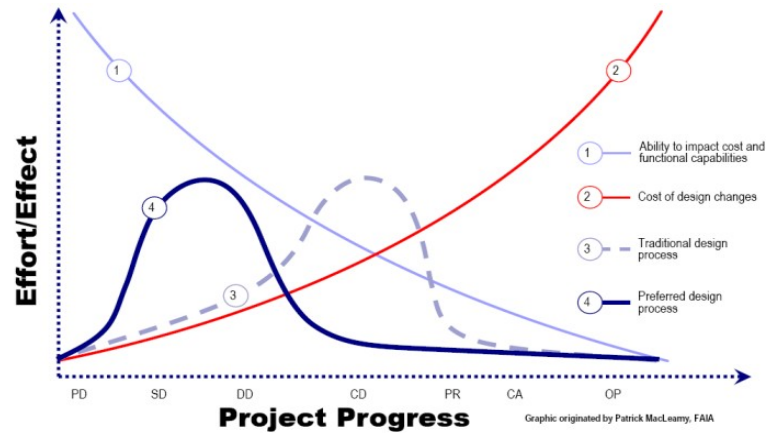
New opportunities have recently been identified by leading CAD vendors in the conceptual design space. Vendors now have a tendency to focus more on the development of conceptual design tools, which historically have been in the shadow of detailed design tools.

### **Market Drivers**

Opportunities have appeared over the changes in construction project delivery methods both in the US and Europe, where design process standards are currently being transformed, and there is a strong demand from architects and clients for a solution to make early design stages more cost effective.

“Decisions on the design stages must be very early in a project to more effectively impact cost and functional capabilities”

*(American Institute of Architects). See [Integrated Project Delivery, AIA 2007](#)*



It is now widely accepted that early design stages could be strengthened by the integration of conceptual and preliminary stages of the design process, including transparency of workflow stages and collaboration improvements (more integrated teams, earlier involvement and collaborative decision-making).

(Image Source: [AIA convention: Integrated Project Delivery: What, Why, and How, 2007, p.43](#))

Design workflow changes have the greatest impact on larger companies who have implemented BIM, and also on small and medium sized design and design-build architecture practices, who are traditionally diverse in the number of components included in conceptual design processes and typically do not have fixed design process patterns.

“Many offices do not separate the site analysis from the pre-design, or in the case of commercial building design, divide the pre-design into more steps such as feasibility study, programming, and then preliminary-design”

*(Kim & Sohn)*

### Addressable Market

The total architecture conceptual design addressable market consists of a broad range of architectural businesses. There are 20,000 architectural firms in the US alone, with gross revenue of approximately 4% of the total annual output of the US economy. (source: [AIA facts and figures](#); [AIA convention Integrated Project Delivery: What, Why, and How, Report 2007](#)) However, growing BIM adoption in both the European and the US architecture markets involves an increasingly wide involvement of other functions at the early design stages - including project managers, drafters, civil and structural engineers - enabling the early sharing of critical information.

### Architects Needs

At the conceptual design phase architects still commonly rely on pen and paper, and believe that currently the phase is not well supported by CAD tools.

There is strong demand for a new 3D modelling solution that enables the design of intuitive concepts by sketch, NURBS, generative geometry or other functions linked with presentation capabilities, in order to compete during the tender stages and meetings with clients.

### Design Software Trends

The solution – according to leading CAD vendors, including [Joe Croser, Global Marketing Director, Platform Products at Bentley Systems](#) - is one of the types of vertical applications used in the design process. Further software development includes links with project management and GIS data, as well as integration into a BIM framework - BIM being considered not just as underlying technology, but as the change in design process.

Vendors should consider incorporating architectural practices into new conceptual modelling solutions, so commonly used early design workflow stages are easily linked with design workload.

Design functionality enhancement includes modelling, concept generation, criteria analysis, visualisation, digital fabrication (prototyping, 3D printing) and interoperability between BIM and non-BIM software.

### Conclusion

The multibillion \$ AEC market currently offers unlimited opportunities for CAD vendors - a flexible but sophisticated 3D conceptual modelling solution is widely expected.

Please [Click HERE](#) to leave a comment or question.