

BIM in China

This white paper examines how building information modeling (BIM) is providing a competitive advantage to architects in China - a country experiencing the world's largest construction boom.

Unparalleled Growth

In 2005, China's economic growth will most likely be three times the growth of the U.S. economy. Consumer products bearing the "Made in China" label are ubiquitous - underscoring the country's dominance as a global mass-manufacturing center. In fact, it's one of the few nations building multibillion-dollar electronics and heavy industrial plants.

China's acceptance into the World Trade Organization in 2001 has further boosted the confidence level of foreign investors, and that investment influx is spurring new construction projects, particularly in major urban centers. The Beijing Olympics in 2008 and the 2010 World Expo in Shanghai are prompting billions of dollars in new construction in those cities, which already have some of the highest commercial and industrial rents in Asia.

In their March 2004 issue, *Architectural Record* reported that China was spending over \$375 billion a year on construction (16% of its gross domestic product) and consumed 55% of the world's production of concrete, 36% of the world's steel and 30% of the world's coal. China's Ministry of Construction estimates that China will double its current building stock by 2020. World Bank estimates are equally staggering: between now and 2015, approximately half of the world's new building construction will take place in China.

China's Building Industry and BIM

China's economic boom and ensuing building frenzy have inevitably produced an environment of intense time pressure and local competition for Chinese architects. AutoCAD-based 2D drafting solutions have been the technology standard, but architects are now turning to BIM to give them the competitive advantage they need to stay afloat in China's frantic building market.

Many Chinese architects also have a keen interest in sustainable design, as China struggles with its burgeoning pollution problems. The robustness of a building information model facilitates the complex design evaluations and analyses that support key aspects of sustainable design - enabling architects to balance China's construction growth with environmental interests.

The largest challenges for Chinese architects transitioning to BIM involve the issue of implementation costs (software, hardware, and training), compounded by a reluctance to abandon a work methodology based on 2D design which, until recently, has served its purpose.

Below are summaries of how two architectural design firms in China have overcome these obstacles and successfully integrated Revit® Architecture software into their design processes and practices.

Wuhan Architectural Design Institute

Founded in 1952, Wuhan Architectural Design Institute (WADI) is a multi-discipline architectural design firm, with 625 employees - including 242 architects. China's construction boom prompted an exponential increase in the number of projects WADI was handling, placing a tremendous strain on their resources. Their architects and project managers soon realized that they needed more than their existing 2D drafting tools and began evaluating BIM. In 2004, they selected Revit and transitioned directly from their existing 2D drafting solution (AutoCAD® software) to BIM.

WADI's first Revit project was a 15,000 square meter auditorium complex. In preparation for the bidding, one architect produced all of the schematic design and presentation documentation in just four days, due to the ability of Revit Architecture to shorten design cycles and quickly produce construction drawings and schedules. According to Song Li, Director of the 6th Architecture Office, "As a design solution, Revit integrates the design process with the drawing process, enabling us to finish both processes simultaneously - drastically increasing our productivity."

WADI is currently using Revit on Prince Hotel - a 20,000 square meter project planned for Wuhan, as well as other high profile projects.



Figure 1:

In preparation for bidding, it took just four days for one WADI architect to produce all of the schematic design and presentation documentation for this 15,000 square meter auditorium complex.

Shenyang Municipal Architectural Design Institute

Founded in 1972, Shenyang Municipal Architectural Design Institute (SMADI), located in Northeast of China, has more than 150 employees including 31 architects in four design offices. Like many other design institutes in China, SMADI faces strong business competition in this building boom - not only from China, but also foreign architects.

In March of 2005, SMADI's chief architect, Yu Zhao - after just one look at how the Revit parametric change engine coordinated changes, keeping the construction documents and data synchronized with the building model - made the decision to migrate their design tool from 2D AutoCAD-based drafting tools to BIM. In addition to the overall coordination, he was also very impressed with the ease and speed of generating presentation material from the building information model.

Their first Revit project was a new courthouse complex slated for Linzhi, Tibet. All the presentation material of the 20,000 square meter building was completed within 20 hours - in spite of design change requests from owner the day before the project was due for bidding.

The ability to coordinate all plans, elevations, and sections automatically has given SMADI a competitive edge they've never had before. "Revit gives us the ability to generate creative designs as well as high-quality documentation. As architects, we can focus our imagination and resources on design, and let technology handle the tedious task of drawing management. For the past decade we've been searching for a competitive edge like this. Now we've found it," reports Mr. Zhao.

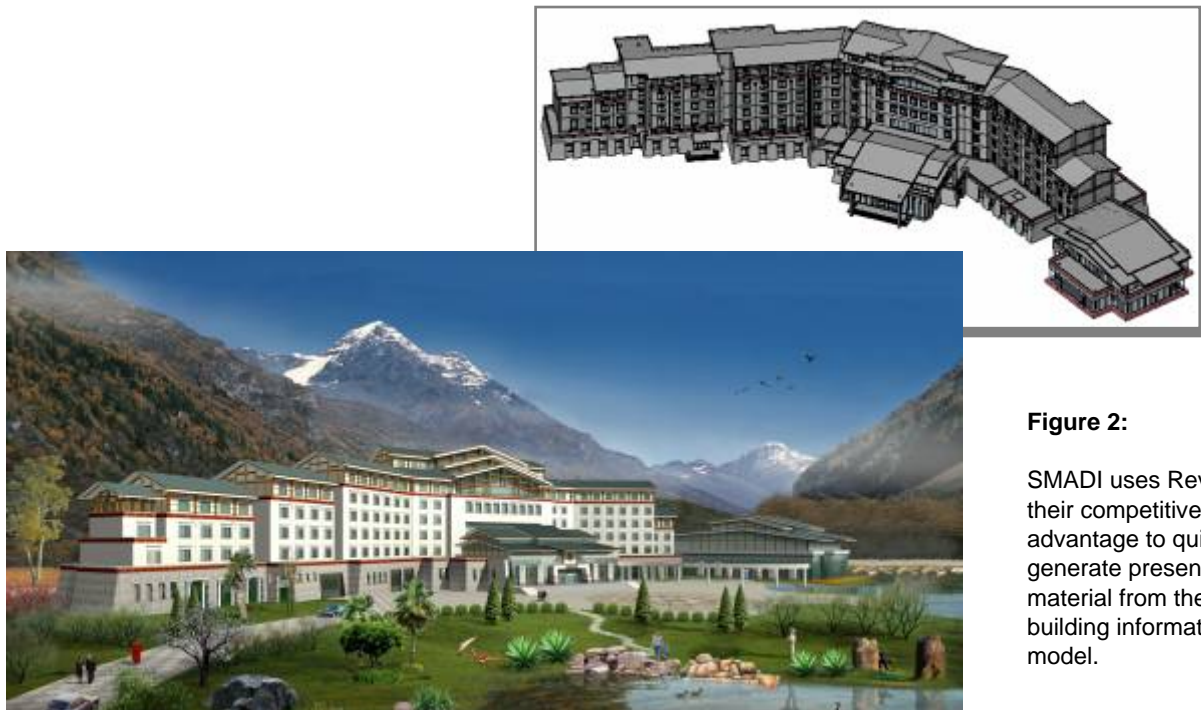


Figure 2:

SMADI uses Revit to their competitive advantage to quickly generate presentation material from the building information model.

Challenges and Opportunities

China's rapid building growth and industry modernization presents great challenges and exciting opportunities. By embracing BIM, China's building industry can catapult beyond the technology adoption and legacy issues that plague many western firms - taking immediate advantage of the productivity benefits that surround a digital building methodology and giving architects a competitive edge in the midst of the largest construction boom in history.

About Revit

The Revit platform is Autodesk's purpose-built solution for building information modeling. Applications such as Revit Architecture, Revit® Structure, and Revit® MEP built on the Revit platform are complete, discipline-specific building design and documentation systems supporting all phases of design and construction documentation. From conceptual studies through the most detailed construction drawings and schedules, applications built on Revit help provide immediate competitive advantage, better coordination and quality, and can contribute to higher profitability for architects and the rest of the building team.

At the heart of the Revit platform is the Revit parametric change engine, which automatically coordinates changes made anywhere — in model views or drawing sheets, schedules, sections, plans... you name it.

For more information about building information modeling please visit us at <http://www.autodesk.com/bim>. For more information about Revit and the discipline-specific applications built on Revit please visit us at <http://www.autodesk.com/revit>.



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