

## Altair: Supporting Business Innovation Through an Innovative Business Model

CIMdata Commentary

Engineers generally think of the suppliers of engineering analysis or CAE (also known as simulation and analysis) solutions as engineering software tools developers and marketers. Based on CIMdata's many years of experience working with CAE suppliers and users, we recognize that this is not the case with Altair Engineering ([www.altair.com](http://www.altair.com)) headquartered in Troy, Michigan.

Founded in 1985, Altair is privately held and has offices throughout North America, South America, Europe and Asia/Pacific. Since its early years, the company has been an important provider of products and services in the areas of product design, advanced engineering software, grid computing technologies and enterprise analytics solutions. The company began life as an engineering services provider, a business it continues to maintain, and introduced its first commercial CAE product, HyperMesh, in 1990. Its 1,300 plus employees deliver these solutions to companies in many industries including automotive, aerospace, government and defense, heavy equipment, consumer products, life and earth sciences, oil and gas, and others.

From its modest beginnings, Altair has developed an innovative business model that is based on a strong suite of CAE solutions, but also includes key internal capabilities for the use of their tools to support real engineering work and even extends to internal product development and innovation, external product development consulting services, and prototype construction of highly engineered products.

Altair's corporate vision: *"Altair strengthens client innovation and decision-making through technology that optimizes the analysis, management and visualization of business and engineering information."* is well supported by this strategy. In fact, the company started in the 1980s as engineering services firm. They have several groups that participate in various product design activities for industrial clients.

Altair's ProductDesign group employs over 500 engineers worldwide. This group's role is to provide full, end-to-end product design support and optimization as well as specialist services within their customer's design teams. These engineers use Altair's CAE products (the HyperWorks family), business intelligence and analytics products (HiQube), industrial design products (solidThinking), and grid and high-performance computing services (PBS Works) to facilitate their work.

An impressive group of companies from many industries use Altair design services. They list customers in automotive (BMW, Ford, Honda, etc.), aerospace (BAE Systems, Boeing, EADS, and more), defense (General Dynamics, Northrop Grumman, Pratt & Whitney, etc.), heavy equipment (Caterpillar, John Deere, Oshkosh Truck, and others), and consumer products (Bose, Fisher Price, Harley Davidson, Kohler...). Some of their work is supported by labs, located inside Altair's headquarters, where they conduct CAE simulation and physical testing as well as execute industrial designs for customers.

CIMdata believes that another aspect of Altair's business model is unique in the CAE supplier industry; their internal facilities and labs that allow them to design, build, and test large and complex products. Currently, they are working on a full-size commuter bus that was

completely designed and simulated within Altair. This bus uses an Altair-designed hybrid diesel-hydraulic power system. The structure of the bus has been analyzed and optimized to reduce weight and improve fuel efficiency.

Interestingly, some internal designs have been commercialized through spin-off businesses. One of these, ilumisys, makes and sells solid-state lighting products. These directly replace fluorescent light tubes with light-emitting diode (LED) lamps. Keeping with the theme of using its own products, the proprietary lighting technology was developed inside Altair.

Another theme at Altair that is unusual among CAE vendors is their development of cloud computing as an accessible resource for their customers. Altair has created its own hosted cloud of high speed computing servers and licenses this to their customers using the same token scheme they use for their simulation and analysis solutions. This service provides great flexibility and allows companies to have access to superior computing resources; especially companies that can't afford to develop their own clouds.

Especially noteworthy is how well respected the Altair organization is among their customers as well as competitors. This is largely due to their sustainable long term market focus on CAE for over 25 years. This focus has been enabled in part by their steady and knowledgeable execution as a profitable privately held company without public shareholders who, as for many suppliers, most likely would have forced them to forever be expanding for the sake of revenue growth—and occasionally oscillating—among many technology markets.

Altair is a rare case of a software and services provider that has consistently executed a combination of market and financial discipline to grow without diluting their market focus, which happens often when technology companies take on investment or equity partners who may have conflicting objectives. Recent examples of this concentrated focus on core markets and competencies are Altair's acquisitions of SimLab, a specialty provider of automated, tailored finite element modeling solutions for powertrain systems within the automotive and heavy equipment industries and of ACUSIM, developers of a general purpose CFD solver (AcuSolve™) which is finite-element based, allowing it to be integrated with other FEA-based technologies to solve fluid-structure interactions and similar multi-physics problems. SimLab and ACUSIM are just two of a number of self-funded technology acquisitions over the years that have provided Altair with increasing depth and breadth in its core simulation and engineering services markets. Other company or product acquisitions have included Radioss, PBS Professional, and solidThinking, the latter giving Altair insight into how industrial design plays a key role further upstream in the product design business. These acquisitions are not random events; each was undertaken as part of corporate strategy to bring intellectual property and proprietary software to the market to provide the foundation for their customers' innovation initiatives.

The value of all this to Altair customers is multi-faceted. First, Altair has a built-in team of CAE and product design specialists who are everyday CAE users of the Altair product suite and who help design and test Altair's own products and services in production use. Altair's software developers have direct access to a large, internal user community. Second, because they have product design experts in-house, they are positioned to understand the needs and processes employed by customers who are pursuing simulation-based design activities. Third, their use of Altair's CAE products leads to extended testing and validation of the products in a "real-world" environment.

The resulting business continuity in Altair's core mission, market vision, and management leadership over many years has also given them the prized rare gift of sustained entrepreneurial freedom to experiment and innovate in more than just their product and

service offerings, but also in their core business and customer engagement models. Examples of this innovation can be found in their unique software licensing and pricing models, their global open HyperWorks partner alliance, and their business ethos of walking-the-talk with their own expert engineering services practicing simulation driven design. When all these separate innovations are combined, a strong CAE supplier of a distinctive class resulted that evolved along a substantially different path due to the freedom to make many small and large innovative decisions as they grew.

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