

## **Cadence Design Systems, Inc.**

### **Market Buster**

#### **Summary**

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Cadence Design Systems, Inc. is well-known as being the world's leader in the electronic design automation (EDA) market. They provide hardware and software to electronics companies for use in designing electronic systems such as semiconductors, networking equipment, computer systems, and consumer electronics. In addition to EDA technologies, Cadence also provides engineering services, such as maintenance, support, and design consultancy.

With 2004 revenues of \$1.2 billion and 5000 employees, Cadence is a firm with a global presence. Headquartered in San Jose, approximately 45% of their sales are in North America, 30% in Japan/Asia, and 25% in Europe. In addition to dozens of sales offices worldwide, Cadence also runs seven domestic research and development facilities, as well as seven international R&D centers, including one in Noida, India.<sup>1,2</sup>

#### **The Story**

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Cadence Design Systems arose in 1988 from the merger of two software companies, ECAD and SDA Systems, both founded in the early 1980s. Through a strategy of both company acquisitions and broadening the scope of software developed in-house, Cadence became the leading EDA software supplier.

In 1993, Cadence established a consulting division called Spectrum Services and two years later, bought Unisys' electronic systems design group. Between 1996 and 1998, Cadence had purchased a maker of integrated circuit design tools, a designer of the connections between elements on a computer chip, a system-on-a-chip software maker, and a semiconductor design group. By 1998, it had become the first EDA company to cross the \$1 billion mark for annual sales.

In 1999, Cadence decided to start marketing its services to industrial product manufacturers. The same year, the CEO was replaced, Cadence purchased one of its biggest rivals (Quickturn Design Systems for \$271 million), and the corporation acquired a printed circuit board design specialist.

Cadence continued its aggressive strategy in 1999 and 2000, by acquiring two private design firms and putting out an IPO on its wholly-owned design subsidiary, Tality. In 2002, after some slimming of the work force during the economic downturn, Cadence obtained the assets of a mixed-signal design tool provider. In 2003, they acquired Celestry Design Technologies, a firm specializing in silicon modeling tools and full-chip circuit simulation software.

"Looking to bridge the technological gap between chip designs and the photomask sets that actually produce integrated circuits, Cadence in 2003 acquired K2 Technologies, a supplier of software for mask data preparation. K2 Technologies has packages that automate mask and reticle checkout, jobdeck creation, and physical verification. The K2 software became part of

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<sup>1</sup> 'Cadence at a Glance' 2005. Retrieved: August 25, 2005 from  
<<http://www.cadence.com/company/cadenceataglance.pdf>>

<sup>2</sup> Kulkarni, V 2002 'Cadence Design Systems, an electronic design automation software firm, plans USD150 mil investment over the next five years in its R&D centre in Noida, India', *Business Line*, 10 January.

Cadence's Design for Manufacturing (DFM) business unit, and was ported to the OpenAccess unified database for easier interaction with other design software."<sup>3</sup>

In 2003, Cadence Design Systems, Inc. decided to purchase Get2Chip, assets of Innotech, and Verplex Systems, a maker of design verification software, to better compete in the EDA market and to better satisfy customers. To this day, Cadence claims to be both a world-class provider of EDA technology and engineering services, and decidedly committed to customer success.<sup>4</sup>

## MarketBusting Moves

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Cadence Design Systems has used their acquisitions and knowledge development to improve their customer offerings and employ a few marketbusting moves.

- #31: Exploit second-order effects of shifts in the value chain
- #35: Build a better mousetrap

### #31: Exploit second-order effects of shifts in the value chain

In the electronics industry, there has been a large shift in operations to locations with an abundant supply of well-educated, cheap labor, such as China and India. Many of the large companies who established manufacturing sites in these places require semiconductors and other design equipment for electronics, and thus the EDA products that Cadence Design Systems offer. Cadence saw this shift as an opportunity to beat out competitors through geographical means. By establishing its own sales operations and R&D centers in Asia, Cadence is better able to serve its customers and offer support, giving them a competitive edge. "We're following our customers," says Jaswinder Ahuja, corporate vice president and managing director of Cadence's India operations. "It's easier to collaborate with them if we're local."<sup>5</sup>

### #35: Build a better mousetrap

By aggressively acquiring firms which could provide Cadence with the abilities to assist electronics companies with their needs throughout the design process, Cadence was able to offer superior products and respond to the desires of their customers. For example, in August 2005, Cadence released a product which tied the packaging of a power supply to its electricity analysis. 'Felton [group director of product marketing for IC co-design at Cadence] said customers asked Cadence to come up with a way to model the package power supply for use during IR drop and ground bounce analysis. That kind of modeling was possible before the new release, Felton said, but it was a tedious manual process involving standalone 3D field solvers.'<sup>6</sup> Another product, Virtuoso AMS Designer, tied together two separate simulation processes used in chip design and verification, which shortened the time spent on the design process and reduced the probability of error.<sup>7</sup> By proactively working with customers, Cadence has improved its offerings across the board and beaten out competitors to become the world's leader in EDA technologies.

## Key Lessons

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<sup>3</sup> Lower, J 2005 'Cadence Design Systems: History', Hoover's. Retrieved: August 25, 2005 from <<http://premium.hoovers.com/subscribe/co/factsheet.xhtml?ID=12867>>

<sup>4</sup> 'Cadence at a Glance' 2005. Retrieved: August 25, 2005 from <<http://www.cadence.com/company/cadenceataglance.pdf>>

<sup>5</sup> 'R&D in India: The Curtain Rises, The Play Has Begun...' 2005. Retrieved: August 25, 2005 from <<http://knowledge.wharton.upenn.edu/article/1278.cfm>>

<sup>6</sup> Goering, R 2005 'Cadence ties packaging and power analysis', *EE Times Online*. Retrieved: September 1, 2005 from <<http://www.eetimes.com/news/design/showArticle.jhtml;jsessionid=SENO5HHXVWS3MQSNDBCSKH0CJUMKJVN?articleID=169500172>>

<sup>7</sup> Zinke, O 2005 'Design and verification with Cadence's Virtuoso AMS Designer', *EE Times/Asia*, June 1.

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## DRAT Table, Cadence Design Systems, Inc.

### SOURCE

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#### External

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Opposition from advocacy groups	Moving R&D operations to India threatens American workers and scientists, thus creating opposition from pro-domestic labor groups.
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#### Internal

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Internal political maneuvering	Research project leaders from around the world must work together to take advantage of the global R&D opportunities.
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Reluctance or resistance by those needed for active implementation	Management at headquarters (San Jose, CA) may get nervous about so much of the company's resources going overseas.
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#### Platform changes required

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Human resource and skills platforms	Staff able to inform customers on and provide support for new products.
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Logistics platforms	New equipment for new products, investment in R&D centers.
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IT and database platforms	Systems able to transfer relevant information internationally.
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### Marketbusting Kite

Element	Needed to Support the Marketbusting System
<b>Agenda</b> The key things that the critical people spend time on	<ol style="list-style-type: none"><li>1. Global integration of operations</li><li>2. Constant innovation to stay ahead of technology curve</li><li>3. Building customer satisfaction and retention</li></ol>
<b>Norms</b> What principles and behaviors are valued?	<ol style="list-style-type: none"><li>1. Innovation</li><li>2. Delivering unequalled customer satisfaction and service</li></ol>
<b>News</b> What information and measures are paramount?	<ol style="list-style-type: none"><li>1. Technological advancements of company and competitors</li><li>2. Customer satisfaction ratings and retention</li></ol>
<b>Allocations</b> What gets resourced and how are people rewarded?	Resources go to <ol style="list-style-type: none"><li>1. R&amp;D centers</li></ol> Rewards and recognition for successes go to <ol style="list-style-type: none"><li>1. Innovation</li><li>2. Customer Service</li><li>3. Customer Support</li></ol>
<b>Structure</b> Power, authority, responsibility structure	<ol style="list-style-type: none"><li>1. Allow freedom for technological breakthroughs</li><li>2. Yet apply communication management across borders to obtain most efficient advances in R&amp;D</li></ol>

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### Sources

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