

## Chapter 10

### Dell, Inc.

Dell is a private American multinational computer company, and it is one of the largest technology companies in the world. It manufactures and sells computers, servers, data storage devices, software, cameras and printers.

Dell Computer Corporation was founded by Michael Dell (Fig. 10.1) in 1984, and it did business initially as PC's Ltd. Michael Dell was a student at the University of Texas in Austin, and he initially set up a computer assembly business from his campus accommodation, where he built IBM-compatible computers from PC components. He decided to drop out of university to focus his attention on developing the business.

The company developed the first computer of its own design in 1985. This was the *Turbo PC* and it sold for \$795. The machine contained an Intel 8088-compatible microprocessor running at a speed of 8 MHz. Dell sold its computers directly to its customers, and each machine was custom-built for each client depending on the options chosen when the order was placed. It focused on businesses rather than consumers in the early years, and it advertised its products on the existing national computer magazines. The company had revenues in excess of \$73 million in its first year of business.

The company dropped its "PC's Ltd." name to become just the "Dell Computer Corporation" in 1987, and the company expanded into international markets. The company developed close links with Microsoft and Intel, and Dell personal computers used one of Microsoft's operating systems and one of Intel's microprocessors. It became a public company in mid-1988.

Dell employs lean manufacturing which provides it with a flexible approach to adapt rapidly to a changing market and allows it to customise individual orders, rather than mass-producing a standard product.

The company expanded its product range to include servers from the mid-1990s. Its servers were based on Microsoft NT running on Intel chips, and they were cheaper than the existing competitor products in the server market, such as products from IBM, HP and Compaq. By the late 1990s, Dell was the main provider of Intel-based servers with over 30 % market share.

**Fig. 10.1** Michael Dell

The rise of the Internet gave Dell the opportunity to expand its direct sales model from mainly business sales to both business and consumers. The consumer market had been plagued with high costs and low profit margins, but the effective use of the Internet helped to change this. The company's Internet site became operational in 1996, and it included a product line designed for individual users. Customers could now buy directly from Dell, and they could customise their order to meet their specific requirements (e.g. processing power, storage, memory, etc.) Dell's computers were highly rated for their reliability, and the company had a good reputation for its customer service and support.

Dell gained market share from its competitors throughout the late 1990s with customers liking its direct sales model and the facility to customise their order to meet their specific needs. Customers voted with their feet, and Dell soon overtook rivals such as Gateway, Packard Bell and Compaq to become the largest maker of personal computers in the world in 1999.

Dell has been very effective in devising supply chain efficiencies to sell established technologies at competitive prices, rather than being an innovator in technology. Its spending on R&D was quite low compared to its competitors, which prevented it from breaking into other lucrative markets such as MP3 players and mobile devices. It expanded its product line to include printers and televisions from 2002, but in 2005 approximately 66 % of Dell's sales remained in the mature personal computer market. Other computer manufacturers such as HP had improved their supply chains and were now as efficient as Dell, and so Dell's profit margins declined.

Dell traditionally had a good reputation for customer service, but this changed for the worse as it moved its call centres offshore. Dell embarked on a series of changes and cost-cutting from 2007, which resulted in plant closures and transfers of work to overseas contractors. The shift in technology from personal computers and laptops to tablets impacted Dell, as it needs to develop effective products to compete in this market. It expanded into the enterprise market with servers,

networking software and services as it is now facing intense competition in the personal computer market from Asian rivals such as Lenovo, which has lower production costs and is willing to accept lower profit margins.

Its revenue and share price decline has continued, and in 2013 Michael Dell and a number of partners bought Dell's public shares in a \$24 billion buyout. Dell is now a private company. For more information on Dell, see [DeF:10].

## 10.1 Dell and Lean Manufacturing

Dell employs lean manufacturing as a tool to respond to changing market conditions and to allow it to provide customised rather than mass-produced products. Lean manufacturing is designed to identify defects earlier and to reduce waste, with staff empowered to use their initiative on the shop floor.

Each customer is viewed as unique and having specific requirements that need to be explicitly stated, rather than Dell predicting what the customer actually wants. Lean manufacturing allows the company to eliminate or maintain very low inventory levels, and it enables the company to respond better and faster to changes in market conditions.

Lean manufacturing employs *just-in-time* (JIT) delivery with components ordered only when they are needed. They are delivered fast enough to be classified as just-in-time. The great advantage of JIT is that the waste associated with maintaining a large warehouse of inventory that may go out of date quickly is avoided.

The only disadvantage is that the cost savings associated with bulk buying is not achieved, but this is more than offset by the savings made in eliminating waste. Table 10.1 describes the Dell lean manufacturing process.

## 10.2 Dell Acquisitions

Dell has acquired several companies over the years to enhance its product portfolio, as well as improving the efficiency of its manufacturing process. It has spent billions of dollars in acquisitions, and these have included companies such as Perot Systems and Quest Software.

Perot Systems is an information technology company that was founded by Ross Perot and others in 1988. It is a leading provider of information technology services to clients in several sectors, including healthcare, government and other commercial segments. Perot Systems was acquired by Dell for \$3.9 billion in 2009.

The acquisition allowed Dell to provide a broader range of IT services and solutions, as well as optimising how they are delivered. It enabled Dell to expand its

**Table 10.1** Dell lean manufacturing

Step	Description
1.	The customer places an order
	The order is sent to the manufacturing centre closest to the customer's address (within 2 h)
	The order is transferred into the manufacturing schedule at the production centre
	The orders for components are sent out regularly (typically every 2 h)
	Dell does not have a warehouse and so frequent deliveries are made (stock levels are kept low)
	There is no inventory waste (as components are ordered only when a customer requirement has been established)
2.	The components are sent down the line for the next stage
	They are fitted with unique identifiers (which are used throughout the lifetime of the product)
	This allows the customer to quote the component number to Dell (for customer service/support)
	It allows Dell to monitor the quality of the components
	The service tag of the customer requirements to build the PC is scanned
	Each part is scanned to connect components to the service tag
3.	The machine is assembled and tested
	The customer requested software is installed onto the machine
	Once all items are installed, the machine is tested again
	The PC is sent to the boxing area
4.	The service tag is scanned on arrival and the machine is placed in the shipping box
	It is sent to the shipping or accumulation area

enterprise solutions capabilities, as well as gaining efficiencies from combining both companies. Dell Perot Systems was ranked as the number one vendor in a survey of healthcare providers in 2010.

Quest Software is a Californian company that offers products for application management, database management, Microsoft Windows management and virtualisation management. It was acquired by Dell for \$2.4 billion in 2012.