Case study

Has the Apple innovation machine stalled?

This case study examines the success and failure of new products from Apple. Many analysts have argued that the death of Steve Jobs has had a significant impact on Apple's innovation ability. What is more likely is that competition has increased and profits have been reduced; but did Apple make mistakes? Difficult times may lie ahead, but the case shows that Apple faced even worse times in the 1990s. Jonathan Ives, Head of Design at Apple, argues Apple is more than one man. High levels of investment seem to suggest a good future.

Source: Zeynep Demir/Shutterstock.com

Apple, innovation and market vision

Stiffer competition in smartphones and tablets from the likes of Samsung has raised concerns over whether the party is over for Apple. One should not be surprised. Apple's fantastic profit margins – 38.6 per cent on sales have attracted many competitors. The iPhones and iPads still generate huge profits. But margins are being eroded by clever competitors like Samsung (see Figure 1.10). Apple needs another disruptive innovation.

Apple made $42 billion in 2012. This was a record for Apple and amongst the all-time records for corporations everywhere. Under Tim Cook, Apple has introduced the iPad Mini – a 7-inch tablet (a category Jobs dismissed as pointless) – which has preserved the iPad's leadership in tablets. This is in addition to Tim Cook's exceptional management of Apple's supply chain. When Cook initially took over Apple's

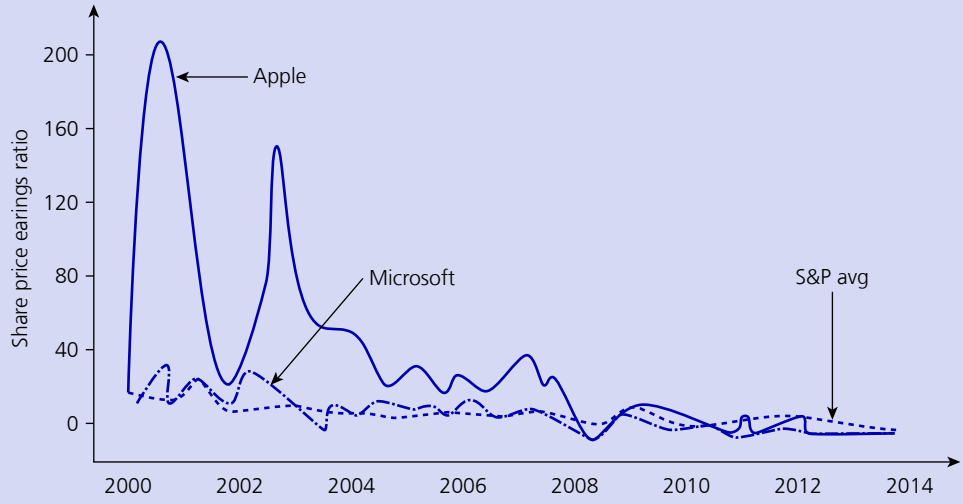

Figure 1.10 The rise and fall and rise of Apple

supply chain, he cut down the number of component suppliers from 100 to 24, forcing companies to compete for Apple's business. More recently, Apple has adopted even stricter management over its supply chain than before. The changes include more frequent inspections, greater time spent on inspections, and a renewed focus on managing costs and product quality.

The iPod, iPhone and iPad have all shown Apple's great skill in bringing disruptive innovations to the market. Disruptive innovation explains the dichotomy of *sustaining* and *disruptive* innovation. A sustaining innovation improves the performance of existing products along the dimensions that mainstream customers value. It results in limited change for established companies. Disruptive innovations, on the other hand, often will have characteristics that traditional customer segments may not want, at least initially. Such innovations will appear as cheaper, simpler and even with inferior quality if compared to existing products, but some new segment will value it.

The iPod, iPhone and iPad also demonstrates Apple's great skill in market vision. Disruptive innovations require a greater change in existing patterns of behaviour and thinking; thus consumers would perceive a higher level of risk and uncertainty in their adoption decisions relative to continuous innovations that depend on established behavioural patterns and perceptions.

This ability has been at the heart of Apple's success. Its ability in market vision or the ability to look into the future and picture products and services that will be successful is a fundamental requirement for those firms wishing to engage in innovation. It involves assessing one's own technological capability and present or future market needs and visioning a market offering that people will want to buy.

Apple needs more new products. One of these new products is likely to be a much cheaper iPhone aimed at emerging markets. Apple sold two million of its top-of-the-range iPhone devices in 2013. However, most Chinese shoppers cannot afford them. Barclays, an investment bank, believes that Apple could produce an iPhone for less than $150 to broaden its appeal. This would certainly generate revenues by appealing to mass markets. But Apple has rarely targeted the mainstream. A review of its past may point the way for the future.

The rise and fall and rise of Apple Corp Inc.

Apple computers began in 1977 when Steven Wozniak and Steven Jobs designed and offered the Apple I to the personal computer field. It was designed over a period of years, and was built only in printed circuit-board form. It debuted in April 1976 at the Homebrew Computer Club in Palo Alto, but few took it seriously. Continual product improvements and wider technological developments, including microprocessor improvements, led to the launch of the Apple Macintosh in 1984.

The Macintosh computer was different because it used a mouse-driven operating system, all other PCs used the keyboard-driven system known as MS DOS (Microsoft Disc operating system). Early in the 1980s, Microsoft licensed its operating system to all PC manufacturers, but Apple decided against this approach, opting instead to stay in control of its system. The 1980s was a period of dramatic growth for personal computers as virtually every office and home began to buy into the PC world. Slowly, Microsoft became the dominant standard, not because its technology was better, but largely because its system became the dominant standard. As people bought PCs, so with it they would buy the operating system: MS Windows, hence it became the de facto dominant standard. The Apple operating system was available only if you bought an Apple PC. Consequently, Apple's market share plummeted. By the mid-1990s, Apple had grown to a $12 billion company, twice the size of Microsoft; but Microsoft was powering ahead on the back of the launch of Windows and it would soon become the dominant tech firm.

In 1993, Apple launched the Newton; its first completely new product in many years. Indeed, it represented Apple's entry into (and perhaps creation of) an entirely new market: Personal Digital Assistants (PDAs). The PDA market was barely present when the Newton was released, but other companies were working on similar devices. The Newton Message Pad featured a variety of personal-organisation applications, such as an address book, a calendar, notes, along with communications capabilities such as faxing and email. It featured a pen-based interface, which used a word-based, trainable handwriting recognition engine. Unfortunately, this engine had been developed by a third party, and was notoriously difficult to use and was partly responsible for the product's failure. This was to represent a low point in Apple's fortunes.

Table 1.9 Apple's new product failures

Apple product	Why it failed
Macintosh Portable (1989–91)	The 16-pound monster had many cutting-edge technologies for the time, such as its active matrix LCD screen, but its weight and the fact that it often would not turn on, even when plugged in, due to its battery design, kept it off users' desks. In 1989 Toshiba and others were shipping the 6-pound notebook form we still use today, making the Macintosh Portable a whale in a market of dolphins.
Apple Newton MessagePad (1993–8)	The Newton MessagePad, a tablet-PDA hybrid with handwriting recognition. There was nothing else like it, but its ungainly size, woeful battery life, and hard-to-read screen relegated it to technology-cult status.
Macintosh Performa series (1992–7)	In the 1990s, Apple was facing increased competition from DOS- and Windows-based PC makers. Apple's then-CEO Michael Spindler decided to sell a line of cheap Macs, called the Performa. They were cheap: flimsy, prone to failure and underpowered – yet still costlier than a cheap PC. Worse, they cannibalised the sales of pricier Macs for a while, rather than expanding the market.
Pippin (1995–6)	The Pippin was a multimedia PC aimed more at gaming and CD playback than traditional computing – more like what a PlayStation or Xbox is today. PlayStation, Nintendo and Sega consoles were already out and more popular, so game developers and users ignored the Pippin.
Macintosh clones (1995–7)	In the mid-1990s, Apple was struggling. Apple decided to let other companies make and sell Macs. The main clone maker was Power Computing. Power Computing's clones cost less and soon surpassed Apple's own Macs in ratings. Steve Jobs returned to Apple in 2007 and quickly killed the clone experiment by releasing Mac OS 9. Apple bought Power Computing and shut it down that year.
Apple USB Mouse (1998–2000)	After taking back control of Apple in 1997, Steve Jobs went about redefining the look and feel of the Mac itself, and his design team created the candy-coloured iMac line that contrasted dramatically with the traditional beige box. It also decided to reinvent the look and feel of the mouse. The new disc design certainly got attention, but for the wrong reasons: it was hard to hold, as it did not fit most people's hands. In 2000, the company released the soapbar-shaped Apple Pro mouse – the elongated, yet still simple, curves could be held comfortably and securely.
Apple TV (2007–present)	Apple's networked media player box was supposed to be the new TiVo, but it is not even as well liked as Windows-based media-centre PCs. Apple TV is fairly limited: Apple TV is not connected to the vast video libraries of Netflix or Blockbuster (BBI), so you are stuck with the iTunes Store's offerings, which many television and movie studios have avoided supporting for fear of suffering the same loss of control as the music industry experienced with iTunes. In other words, Apple TV is not that innovative or that capable.

In February 1996, *Business Week* put Apple on its front cover suggesting the demise of the company.

With so much success currently washing around the firm, it is sometimes difficult to recall all of Apple's failures. So I have listed them in Table 1.9. Some of them were very bad. But learning from your mistakes is an important lesson in every aspect of life and it seems that Apple has learnt well.

In the mid-1990s, Apple's future in the computer technology industry looked bleak, with a diversified product portfolio and a low market share within the PC market of only 3 per cent. Many were, therefore, surprised when Steven Jobs returned to the company as Chief Executive in 1997. He quickly set about culling many product lines and much of its operations and decided to focus on only a few products, including the new-looking iMac. This coincided with the economic boom in the late 1990s and allowed Apple to generate cash very quickly. This provided revenue for the development of the iPod, which was to transform the fortunes of Apple. Table 1.10 shows the Apple and Steve Jobs relationship.

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Table 1.10 Steve Jobs and Apple

Year	Event	Year	Event
1976	Co-founds Apple with Steve Wozniak	2001	Launches iPod
1976	Apple launches first computer	2003	iTunes launched
1984	Launch of Apple Mac	2007	iPhone lauched
1985	Jobs ousted in Boardroom battle	2010	iPad launched
1986	Co-founds Pixar	2010	Apple overtakes Microsoft
1997	Returns to Apple	2011	iCloud launched
1998	Launch of iMac	2011	Steve Jobs dies
2001	First Apple store opens		

Jonathan Ive and life without Steve Jobs

Jonathan Ive is the British designer behind Apple's iconic iPods, iPads and iPhones. It is hard to overestimate the influence of Jonathan Ive. He is due to receive $25 million (£15.5 million) in shares, which he was able to buy for £7 million. The money will contribute to his fortune of more than £80 million. In September 2012, Ive seems to have committed himself to Apple when he bought a $17 million house in San Francisco. In 2012, Ive was promoted to a bigger role at Apple where he now oversees all product design, hardware and software. This follows news that Apple is parting with mobile software chief Scott Forstall. Ive will fill some of the vacuum left by Forstall. Apple announced the following:

> *Jonathan Ive will provide leadership and direction for Human Interface (HI) across the company in addition to his role as the leader of Industrial Design. His incredible design aesthetic has been the driving force behind the look and feel of Apple's products for more than a decade.*

Ive is softly spoken and has worked at Apple in California since 1992 and, since 1997, has been in charge of its designs. This may well make him the most influential designer in the world. In creating the iMac, he helped save Apple. With the iPod, he unleashed a product that profoundly altered the music industry, whilst the iPhone is doing the same to the mobile phone industry. The most recent product from his team, the Apple Watch, is setting the standard for an entirely new category of device.

He studied design at Newcastle Polytechnic, now Northumbria University, where he still returns frequently to give guest lectures. Ive emphasises the teamwork involved in producing products such as the iMac, the candy-coloured computer that relaunched Apple on the path to success, or the iPad. Ive and his team do not just design the products that Apple makes. The ideas are often so different that, frequently, they have to design the entire production process that the factories will use to make them.

In interviews, Ive has said that, 'We don't really talk about design, we talk about developing ideas and making products.' The simplicity that is found in the hardware has not always been matched in the software, which since the rise of iOS – the operating system for iPad, iPhone and iPod touch – has been marked by something known as skeuomorphism, a tendency for new designs to retain ornamental features of the old design.

There have also been unsuccessful products (see Table 1.9). But Ive says that most of the company's failures are kept far behind the scenes. He goes on: 'And there have been times when we've been working on a program and when we are at a very mature stage and we do have solutions and you have that sinking feeling because you're trying to articulate the values to yourself and to others just a little bit too loudly. This is probably indicative of the fact that actually it's not good enough. On a number of occasions we've actually all been honest with ourselves and said "you know, this isn't good enough, we need to stop". And that's very difficult.' Knowing when to call a halt to a project is an important part of his role.

There is, within Apple, a strong belief in people focusing on their area of expertise, says Ive, but when a product is being developed, the process can be quite fluid. He says: 'As we're sitting together to develop a product, you would struggle to identify

who the electrical engineer is, who's the mechanical engineer, who's the industrial designer.' Teamwork is an important part of the process.

'One of the things that is particularly precious about working at Apple is that many of us on the design team have worked together for 15-plus years and there's a wonderful thing about learning as a group. A fundamental part of that is making mistakes together. There's no learning without trying lots of ideas and failing lots of times.'

In interviews, Ive has said that the absence of Jobs has not affected the way Apple develops products. He says they will do it in exactly the same way because there is a large group of people that work in the same way. That team is the reason that Ive believes Apple will continue to succeed. 'We have become rather addicted to learning as a group of people and trying to solve very difficult problems as a team. And we get enormous satisfaction from doing that. In 2012, and very unusually, Apple flew in its entire design team from San Francisco in recognition of the importance of the Design & Art Direction Awards – all 16 of them accompanied Sir Jonathan Ive on stage to collect the award for best design studio.

Troubles ahead?

An area of criticism levelled against Apple Inc. that has also received considerable media coverage is the issue of excessive secrecy and obsessive control exerted by Apple on its suppliers. One of these suppliers is Foxconn, the world's biggest contract maker of IT goods, including the iPhone. It is far less well known than the brands it assembles, but it is one of Taiwan's largest companies. Reuters news agency reported in 2010 that Apple goes to 'extreme lengths' to protect even the smallest details of its new products under development (Pomfret and Soh, 2010). At Foxconn's assembly plant in Longhua, South China, workers swipe security cards at the gate and guards check the occupants of each vehicle with fingerprint recognition scanners. It resembles a fortress – so much for open innovation! Many of Apple's finished gadgets, from iPods to iPads, are assembled at industrial compounds like the one in Longhua. Many of Apple's tactics seem like they have emerged from a James Bond film: information is assiduously guarded and handed out only on a need-to-know basis; employees suspected of leaks may be investigated by the contractor; and the company makes it clear that it will not hesitate to sue if secrets are spilled. To try to control information, Apple will give contract manufacturers different products, just to try them out. That way, the source of any leaks becomes immediately obvious. Apple's obsession with secrecy is the stuff of legend in Silicon Valley. Over the years, it has fired executives over leaks and sued bloggers to stop trade secrets from being exposed. Apple also helps keep its components out of the mainstream by insisting on custom designs rather than off-the-shelf parts – a practice that leaves many suppliers frustrated. Not surprisingly, landing a contract with Apple will always include a confidentiality clause. And they usually come with stiff penalties in the event that a breach is discovered. Such agreements often come on top of unannounced checks by Apple officials to maintain standards. However, the difficulty lies in proving the source of a leak. In the absence of solid evidence, the most Apple can do is to switch suppliers once the contract runs out. At times, all of this secrecy seems to run out of control. In a case that made global headlines, an employee in China for Foxconn was believed to have jumped to his death after being interrogated by his employer. According to local press reports, he was under suspicion of taking an iPhone prototype – to which he had access – out of the factory (Watts, 2010).

Outsourcing and the danger of creating a competitor

The benefits of outsourcing seem to have been demonstrated clearly by Apple, as it has masterfully used its supply chain to deliver low cost components and thereby enabling it to create large margins for itself. Table 1.11 shows the key components that go into the iPhone. One of the ongoing challenges when a firm outsources is the ever present threat that one of your partners decides that it can make for itself what it makes for you. This has been demonstrated time and again across a variety of industries. Acer is a good example. For Apple, Samsung has turned from partner to competitor as it learnt from Apple and then developed further the technologies it was supplying.

The way forward?

The best way for the company to prove it is not past its prime would be for it to disrupt another big market. Since Jobs' death in 2011, Apple has concentrated on sprucing up its existing products. Now investors want

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Table 1.11 Key components that go into the iPhone

Component part	Supplier*
Touch screen	Japan Display Inc. or LG
Flash memory disk	SanDisk or SK Hynix, Samsung, Toshiba
Processor	Samsung Semiconductors
Processor	Qualcomm
Camera module	Qualcomm
Phone casing	Qualcomm
Battery	Sony
Touchscreen controller	Texas Instruments
Duplexer	Avago

*Has been a supplier in the past and is a likely supplier, but suppliers are reluctant to reveal contracts.

to see it conjure up entirely new ones. All eyes are on television. Tim Cook, CEO of Apple, has said that he feels like he has 'gone backwards in time by 20 or 30 years' when he switches on his TV at home. This could suggest that Apple will launch an iTV. The iTV, which may be controlled via iPads and iPhones, could be a digital hub for the home. It would let people check whether their washing machine has finished its cycle whilst they gossip on Facebook and watch their favourite soap. It should also boost purchases of iPads and other Apple gear, as more people get sucked into the firm's 'ecosystem' of linked devices and software.

Source: Images by Morgana/Alamy Images

Apple will also, as usual, face stiff competition from Samsung. The South Korean firm is one of several that already sell smart TVs. Indeed, Samsung seems to be churning out more and more groundbreaking devices whilst Apple has produced only incremental innovations of late. Apple's court battles with Samsung over smartphone patents have reinforced the impression that it is on the defensive.

It is worthy of note that Apple's capital expenditure has soared in recent quarters, reaching levels typically seen at firms with huge manufacturing operations, such as Intel. Some of this money is going into data centres to support cloud services like iTunes. But where is the rest of the investment going?

One area clearly in need of substantial investment is the retail operation. The Apple stores have been experiencing very long queues as people bring in faulty iPhones, iPads and laptops. The so-called Apple genius experts offer technical help to customers. But there are too few of them. This is because Apple has relatively few shops but increasing numbers of people have Apple products. The London Regent Street store employs 120 geniuses, each sees about 30 customers a day, but demand is so great that it is not possible to book an appointment. One solution would be to reduce numbers of customers. Take the product more upmarket and make it more expensive so it is able to serve fewer customers. Alternatively, investments could be made into effective operations (see Chapter 5) or improved service delivery (see Chapter 15). The Apple Watch and a move into wearable technology could see the Apple stores become more like clothing stores, such as Gap or Abercromby & Fitch. This could present a whole host of new problems.

Conclusions

The iPod was not the first digital music player, nor was the iPhone the first smartphone or the iPad the first tablet. Apple imitated other products, but they appeal

to us on a human level because they are so aesthetically pleasing and intuitive to use. One of the reasons that Apple is so revered by designers is because it is not obsessed by technology for technology's sake.

Apple, once best known for its Macintosh computers, and now known for its iPod, iPhone and its iTune online music store, is at last making up for its lack of market gains in the highly competitive PC market. It is necessary to remind business students that, ultimately, this is about money and Apple was twice the size of Microsoft in 1992 and, for 10 years, it failed to deliver growth for its shareholders. It is only in the last 10 years that Apple has started to repay investors, reaching an equivalent market value of Microsoft in 2010. Fortunes change quickly in technology intensive industries, but they change even more quickly in the world of fashion.

One of Jobs' greatest skills was being able to decide which projects the firm should not undertake. For example, it is said that engineers at Apple were urging its boss to create a tablet computer in early 2000/2. But Jobs turned a deaf ear to their entreaties and, instead, insisted that the company focus on producing a smartphone. The result was the iPhone, which transformed yet another market and is still minting money. In a creative cauldron like Apple, ideas are rarely in short supply. But the skill of choosing the right ones to focus on at the right time is rare.

Yet, even if it produces a cheaper iPhone, pushes deep into China and wows the world with a smart TV and Apple Watch, competition is now tougher in its core markets. Rivals will not let it disrupt new ones so easily. Has the firm's great innovation engine stalled?

Questions