Quantum Strategy at Apple Inc

Loizos Heracleous

Over the last 15 years, Apple Inc has revolutionized the personal electronics, telecom, computer and media industries through a string of blockbuster products that offer unique, designer, integrated customer experiences. In the process, the company has helped to accelerate the blurring of industry boundaries through the spread of devices that offer convergent technologies, and to position itself so that it exerts significant power over both consumers and industry players, with outstanding performance results. Apple became the most valuable listed company, with a market value of US$623 billion in August 2012, and has gathered the highest accumulation of cash reserves ($121 billion in September 2012) of any listed company. It regularly achieves net margins of above 20 percent in industries where most competitors achieve single-digit margins. Its net margin was 26.7 percent during 2012, having increased from 23.9 percent in 2011 and 21.5 percent in 2010. During the same period, Apple’s revenues increased from US$65.2 billion in 2010 to US $108.2 billion in 2011 and to US$156.5 billion in 2012.

The chief architect of the business model and value system that led to this exceptional performance is widely acknowledged to be the late Steve Jobs. With Jobs’ passing in October 2011, many have wondered whether the magic at Apple would last, or gradually fizzle out. In this article, I take an in-depth look at the strategy and organization of Apple to argue that the magic will last. This is not only due to clear and consistent strategic choices over time that have served to institutionalize the Apple way; it is also due to the fact that Apple has achieved what might be called Quantum Strategy—a strategy that is both rare, and incredibly difficult for competitors to imitate.

A key aspect of Apple’s strategy is the ability to balance intense efficiency in operations (in fact the highest efficiency levels in its peer group), with outstanding serial innovation and addictive product design, both of which command premium pricing and redefine markets. This combination begs conventional wisdom, which maintains that if a company’s competitive advantage is based on intense efficiency and value, it won’t invest beyond what’s necessary in innovation, design, or service. In fact it will strive to cut costs everywhere along its value chain, so as to align these elements with its strategy. Conversely, conventional wisdom holds that a company competing on innovation, outstanding design, or service excellence will not be able to reach intense levels of efficiency, since these capabilities are costly to develop and maintain.

Apple, however, has achieved both—what might be seen as the holy grail of strategy—and it is worth asking how. The answer can help us gain insight into the trickiest of strategies to execute, and one that most companies do not even try to achieve. This strategy, if successfully executed, represents a shift of the iso-value curve to the right in any industry it is employed in, not just movement along the curve where most competitors are positioned. I call this Quantum Strategy, after the idea that at the quantum level of reality, the same electron can be at two places at the same time, and two different electrons can occupy the same physical space. Both seem to be logical and natural impossibilities, but nevertheless do occur. An understanding of Quantum Strategy offers important lessons for executives. In particular, we can understand the principles are involved in breaking the trade-offs that are conventionally assumed to constrain strategic choices and to lock firms in single generic strategies.

FROM GENERIC STRATEGIES AND ONE-DIMENSIONAL STRATEGIC CHOICES, TO BREAKING TRADE-OFFS

Porter’s classic strategies have shaped strategic thinking for decades, and Porter’s ideas have consistently been recognized as among the most influential in business. Most companies have employed differentiation, cost leadership or niche strategies as a first approximation to their strategic thinking. The belief has been, as Porter had argued, that it is impossible to achieve a sustained, true combination of cost leadership and differentiation because of the inherent
conflicts that would occur if a firm tried to do so. At the time Porter developed and popularized these ideas (late 1970s/early 1980s), this proposition was both reasonable and valid. Since then, however, things have changed. Novel organizational forms that include outsourcing, virtual organizations and co-opetition have emerged. So have new working practices such as online, flexible and portfolio working, as well as new information and communication technologies and manufacturing practices (computer assisted design and computer assisted manufacturing). A blend of these with courageous leadership prepared to stand apart from the herd and challenge conventional industry norms, has enabled a select few companies to break the trade-offs associated with generic strategies and achieve the holy grail of strategy.

Apple is a master of Quantum Strategy, which is both unconventional as well as extremely difficult to implement. The company has accomplished serial innovation and outstanding design in terms of its offerings and its business model as well as simultaneous cost leadership, having become more efficient than the traditional cost leader, Dell. How has Apple accomplished this seemingly impossible strategy, and what can we learn from this?

To set the scene for the discussion, after a description of the research methodology, we briefly outline the various solutions proposed to the puzzle of how to achieve such a strategy. We note that these solutions remain at a broad conceptual level rather than at the level of actionable knowledge. What is missing from current literature is a better understanding of how a company can accomplish such a strategy within the same organizational set-up, rather than, for example, within different subsidiaries, each of which employs facets of this strategy. We then discuss how Apple has managed to implement a Quantum Strategy.

**RESEARCH METHODOLOGY**

The primary aim of this research was to understand how a company can achieve a strategy that integrates potentially contradictory elements, a combination deemed impossible by strategic orthodoxy. The research began in 2008, by conducting a literature review of the key scholarly works relating to balancing potentially contradictory elements of strategy and organization, which enabled the identification of a key gap in the research. The gap is that while we know the what (i.e. the need to balance potentially conflicting elements), we do not know the how of such strategies. I then conducted archival research on Apple, examining annual reports, analyst reports, media articles, scholarly publications, and books about the company by authors that include former Apple employees. The data gathered, which included several interviews with Steve Jobs, led to a better understanding of both Apple’s strategic positioning, and important elements of its history, strategic choices, internal organization and culture.

One in-depth case study on Apple was prepared in 2009 (European Case Clearing House, case number 309-038-1, accompanied by Teaching notes, number 309-038-8). Updated versions of both these documents were prepared in March 2012. Neither the case study, nor the instructional notes discuss Quantum Strategy or the integration of potentially contradictory features; but contain background information that helps to inform an understanding of how this strategy can be implemented.

Once I examined Apple’s efficiency, which was industry-leading (as shown in Figs. 1 and 2 and discussed elsewhere in the text), I realized that something special was happening, beyond Apple’s innovation and design competencies. The integration of these competencies with intense efficiency was offering Apple unique, sustainable competitive advantage, which became manifested in Apple’s extraordinary

![Inventory turnover](image)

*Figure 1* Inventory turnover of Apple Inc vs. competitors (inventory turnover defined as cost of goods sold divided by the average of inventories in two most recent balance sheets).
financial performance. I then dug into the data to try and understand how Apple’s strategic choices and organizational set-up support a Quantum Strategy, the breaking of trade-offs and the integration of elements that most companies would consider mutually contradictory (as shown in Table 1). The final step was to derive some more broadly applicable principles of achieving a Quantum Strategy, as shown in Fig. 4.

THE PUZZLE OF ACHIEVING A QUANTUM STRATEGY

Apple has achieved its outstanding performance through effectively implementing an unconventional strategy: differentiation through innovation (along various dimensions that include serial, strategic and incremental innovation), with simultaneous intense levels of efficiency, leading to the lowest costs in its peer group. Conventional wisdom holds that such strategies would be impossible to achieve in a long-term, sustainable timeframe, because they entail mutually contradictory investments and organizational processes. Companies that try to achieve them would thus end up “stuck in the middle,” without any competitive advantage; a position that has gradually become strategic orthodoxy. Porter maintained that companies that achieve such a strategy can only do so temporarily, only if competitors are themselves stuck in the middle, having achieved neither cost leadership nor differentiation; if cost is strongly affected by market share and inter-company relationships; or if a firm pioneers a

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**Figure 2** Five-year sales, general & administrative costs as percentage of revenues.

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**Table 1** How Apple Inc implements Quantum Strategy.

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<tr>
<th>Indicators of differentiation</th>
<th>At rock bottom cost</th>
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<td><strong>How Apple achieves differentiation</strong></td>
<td><strong>Indicators of efficiency</strong></td>
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<tr>
<td>Winner of several innovation and design awards; consistent groundbreaking offerings</td>
<td>Lowest SG&amp;A costs; highest inventory turnover; both more efficient than Dell</td>
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<td>Ability to command premium prices and achieve exceptional profit margins and revenue growth</td>
<td>R&amp;D intensity lowest in peer group (while recognized as world’s most innovative company)</td>
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<td><strong>How Apple achieves intensive efficiency</strong></td>
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<td>Strategic focus in terms of product-markets, types of products, and product features</td>
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<td>Distributed org design — high value added functions in California, manufacturing outsourced to cheapest locations</td>
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<td>Synergies from related diversification in terms of industries as well as products (e.g. technological platforms)</td>
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<td>Intense focus on supply chain efficiency (less warehouses, reduction of supplier numbers)</td>
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<td>Flat organization and simplified processes increase efficiency</td>
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major technological or process innovation. Such advantages would swiftly be copied by competitors, however, leading to the need for firms to eventually make a clear choice about which generic strategy to follow, and configure their organization accordingly to implement it.

Research has generally supported Porter’s position that a clear choice of generic strategies leads to superior performance, especially if that choice is associated with appropriate organization structures, and matches the features of the competitive environment, as Danny Miller has found. His research, however, also showed that firms could combine features of differentiation and cost leadership strategies, and that these strategies were not necessarily as distinct as Porter had argued.

The idea that companies should balance features that are considered contradictory, incompatible or in tension has gained momentum. For example, Tushman and O’Reilly suggested that companies should balance efficiency in the present with building capacity for future innovation. They proposed that this can be done by having separate subsidiaries with different strategies, tasks, competencies, cultures, structures, control systems and leadership styles integrated at the senior executive levels through a common executive team. The assumption here however is one of structural separation of business units rather than integration of potentially contradictory elements within the same organizational setup.

Markides and Charitou have discussed how companies can compete with dual business models. They recommended that if there are serious potential conflicts between the models, they should be kept separate in different subsidiaries. If the markets these business models serve are similar, however, the subsidiaries could be gradually integrated within the same overall organization to gain synergies. Nevertheless, the assumption here is that these business models would belong to different businesses competing in different markets with different brand identities within an overall corporate umbrella, rather than a single business adopting a dual generic strategy.

Others, such as Birkinshaw and Gibson, have moved away from a focus on organization design, toward softer issues such as building employee competencies to balance conflicting goals, within a supportive organizational context. They recommended instituting performance management with stretching targets, coupled with social support, to enable individuals to balance alignment in the present with adaptability for the future.

Even though the above research is enlightening, there is still something missing in our understanding, and this is: how can companies realize Quantum Strategies within the same organizational setup? We can only understand this if we observe closely organizations which have accomplished it, and try to distill the relevant principles. In the next section we analyze how Apple Inc has accomplished such a strategy.

QUANTUM STRATEGY AT APPLE INC

Achieving Exceptional Innovation

Apple has been awarded as the most innovative company in the world by Business Week for seven consecutive years (2005–2011) and has topped Fortune’s world’s most admired companies for the fifth year in a row (2008–2012). Apple’s design prowess, and ability to seamlessly integrate hardware and software while attracting the best people is widely recognized.

The differentiation side of the equation is easier to understand; in fact, it’s a textbook approach. Make choices about which technologies to ride based on keen market insight. Focus on developing innovation capability, through having the best people and pushing them hard, within a corporate culture where innovation is second nature. Add to this the “deep collaboration” approach made possible by the fact that Apple’s innovation is centralized in a single physical space, its campus in California, and you have an innovation hotbed. Buttress your market presence through clever, contrarian maverick branding, supported by radically new products, and you can develop a cult following. Control the customer experience and create barriers to entry for competitors and barriers to exit for customers through developing constellations rather than stand-alone products, and you can charge premium prices with near impunity. Have a courageous, eccentric, genius, driven leader who takes the tough decisions associated with the above; and you have a recipe for success. What is harder to understand is how all this can be done at industry-leading efficiency levels.

Achieving Rock-Bottom Cost

Efficiency was a major goal of Steve Jobs when he recruited Tim Cook in 1998 from Compaq, to be Apple’s chief operating officer, with the express goal of making Apple more efficient than the traditional cost leader, Dell. Cook was instrumental in driving efficiency by streamlining Apple’s manufacturing processes, supply chain and distribution operations. Soon after moving to Apple, Cook rationalized the warehouses for finished products, reasoning that “if you have closets, you’ll fill them up.” He also cut the number of key suppliers from 100 to 24, enhancing Apple’s bargaining power with these suppliers; and asked them to set up near Apple’s facilities so that components could be delivered just-in-time and manufacturing time slashed.

However, what is not widely recognized is that Apple’s efficiency is as much due to strategic focus and simplicity, as to supply chain rationalization. Apple focuses in terms of target market, of product line, of product design and even in terms of its own organization design.

First, Apple aims largely for the consumer market as opposed to the B2B sector, allowing the company to simplify its investments and operations and focus on what it does best. The market proposition in the consumer sector can focus on coolness, desire, and fun, elements alien to corporate buyers who are accountable for IT (information technology) investments and go for reliability, specifications and value.

Second, the narrow depth and breadth of the product line preserves management attention, facilitates marketing and increases negotiating power over suppliers. Apple chose not to produce printers and scanners, for example, given the narrow margins and low cult potential. Rather than offering several models of the iPhone with an array of different functions, as Nokia does for its own product lines, Apple
offers one main model of the iPhone, which is regularly updated. After Jobs returned to Apple in 1997, he terminated two thirds of development projects, since he judged them as not having the potential to deliver groundbreaking products. Jobs exclaimed in the first management meeting after his return, dressed in shorts and sneakers and bearing stubble, that Apple was in trouble because the products had no sex any more.

Third, there is simplicity in the design and features of the products that Apple does produce. The designs are both streamlined and limited in number, and include only a few features that buyers will actually use. In making these difficult choices (of what to focus on, and which features are best to include out of the hundreds of potential features), Apple becomes aligned with its customers’ usage patterns and increases value for the customer, while at the same time decreasing the cost of production through simplicity in design and rationalization of features.

Fourth, Apple’s own organization design is flat and bureaucracy is eschewed. As Jobs explained, Apple “is organized like a start-up. One person is in charge of iPhone OS software, one person is in charge of Mac hardware, one person is in charge of iPhone hardware engineering, another person is in charge of worldwide marketing, another person is in charge of operations.” Apple retains control of the functions that matter (design and innovation), while outsourcing a large percentage of the functions that can be provided by others more efficiently (manufacturing).

As with other elements of its strategy, Apple has ignored popular pronouncements that companies should locate their R&D (research and development) facilities around the world, near their main markets, and engage in global transfer of learning. Rather than being dispersed around the world, innovation takes place in a single space, the magic cauldron at One Infinite Loop in California. By hiring the best and colo-locating them in the innovation melting pot of Apple’s cam-pus, Apple achieves extraordinary results, with only a fraction of innovation spending related to its competitors. The acknowledged most innovative company in the world has a 5-year R&D intensity of 2.7 percent of revenues. Comparatively IBM spends 6.1 percent, RIMM 6.5 percent, Google 12.9 percent and Intel 15.4 percent. HP (Hewlett-Packard) spends the same percentage as Apple, at 2.7 percent, and Dell less, at 1.1 percent, but these companies do not position them-selves as serial innovators and innovation does not appear to be integral to their strategy.

Key metrics of efficiency confirm that Apple is now, on most measures, more efficient than Dell and by several degrees more efficient than other competitors. For example, Apple turns over its inventory by over 67 times per year, whereas Dell does so by 35 times. At the other end of the spectrum, Intel does so by 3.7 times, Sony 5.4 times, HP by 13.3 times and RIMM by 14.6 times, as shown in Fig. 1. Sony and HP are more comparable to Apple given the nature of their offerings rather than Intel (a B2B company) or RIMM (largely dealing in one class of product). The stark difference in inventory turnover rates of these companies is reflected in profitability. Apple’s 5-year net margin has been 20.7 percent, while Sony’s has been zero (having made losses over the previous four years) and HP’s has been 6.6 percent.

Further, if we consider five-year averages of sales, general and administrative costs as a percentage of revenues, we can see that Apple has an exceptionally low level (a year-by-year comparison also shows a decreasing trend). With a 5-year SGA of 8.8 percent, Apple is significantly more efficient than its competitors. Even Dell, the traditional cost leader, is at 12.4 percent, while Sony, plagued by years of political in-fighting, lackluster innovation and an apparent unwillingness to take tough decisions on cost, is at 22.1 percent. Interestingly, IBM is at the same level, at 22.1 percent, but IBM can command a premium price for its services and high-end hardware, deliv-ering large IT solutions projects to corporations with sig-nificant support components, leading to positive performance (a 5-year net margin of 13.2 percent and 5-year gross margin of 50 percent).

Apple has accomplished Quantum strategy within the same organizational setup, skillfully integrating elements of strategy that most other companies would consider dis-tinct; and achieved long-term competitive success in the process. Table 1 summarizes the main elements of how Apple implements its strategy.

**MAKING SUPER-NORMAL PROFITS IN HYPERCOMPETITIVE INDUSTRIES: HOW TO NAVIGATE TREACHEROUS RAPIDS**

Quantum strategy has enabled Apple to achieve super-normal profits in hyper-competitive industries with thin margins. Competition in the computer industry for example, which in 2012 accounted for about 15 percent of Apple’s revenues, is vicious, with very slim margins. Rivalry among competitors is intense. Since the product has largely become commodi-tized, competition is mainly on the basis of price, and there is fragmentation of market share with no price leader able to lead with a healthy pricing strategy. Barriers to new entrants are low; a company that wants to enter the industry can buy standardized components off the shelf, assemble them in a cheap location, have a low cost distribution system and target price-conscious customers. Even though the product uses standardized components from suppliers with low bar-gaining power, Windows and Intel have high bargaining power and reap the lion’s share of the industry profits, squeezing manufacturers further. Customers are demanding, knowl-edgeable, price sensitive and with lots of choice. Even though there are no direct substitutes to laptops and desktops, new devices such as the iPad can potentially challenge them and provide at least some of their functions.

All of these factors mean that the computer industry is hugely unattractive from the perspective of returns. Similar levels of competitive intensity and slim margins apply to the consumer electronics and media industries that largely account for the remainder of Apple’s revenues. How does Apple manage to have exceptional profit margins in such an environment?

Apple’s Quantum strategy has put in place certain conditions that reduce the impact of industry forces on itself, allowing it to safely navigate the rapids. Firstly, Apple can effectively mitigate rivalry by not playing the game of price competition. Because of the exceptional design of its pro-ducts, and continuous innovation, it can sustain its differ-entiation, which enables it to keep charging a premium price and to fund further innovations (achieving a virtuous circle). Apple owns its operating system, so does not have to pay high
PRINCIPLES OF QUANTUM STRATEGY

What principles can we draw from Apple’s remarkable feat? Fig. 4 summarizes what can be learned from our analysis. The horizontal axis in the figure relates to business model and strategy considerations. The vertical axis relates to building competitive advantage at rock-bottom cost. Within the quadrants are principles that companies can follow in their quest to achieve Quantum Strategy. These include aiming for strategic alignment, focus, simplicity, synergies, differentiation, and systemic, mutually reinforcing interconnections. These principles, expressed in terms of strategic decisions, actions and investments, can elevate the firm in a position of strength with respect to industry forces (as analyzed in the previous section), leading to extraordinary performance.

While these principles are hard to disagree with, an analysis of most companies will reveal that many are not implemented effectively or even pursued. Leadership often takes its eye off the ball, allowing misalignments to develop and go unchecked, especially when there is no robust oversight by an active board. Rather than aspiring to create the future and shape their markets, many companies take the external environment as a given, become me-too competitors and end up trailing behind the market-makers.

Most companies put their fingers in too many pies, believing, for example, that diversification and market saturation (having a portfolio of hundreds of product models and permutations) are good ways of earning and defending market share. Rather, this leads to dissipation of management time and energy, lack of discipline in capital allocation, underperforming businesses, and uninspiring products. In such cases, the tough decisions and choices about what will differentiate the company are not faced, and robust performance analysis by
product or business is not carried out or not followed through. Over time, bureaucracy and organizational complexity creep in, employee drive gets squashed, and the stage for lackluster performance is set.

All the above decisions are the responsibility of strategic leaders — individuals who dare to stand up and be counted, who take calculated risks with conviction, to achieve something different than the masses of competitors. Strategic leadership is at the heart of competitive advantage. Leaders have to make strategic choices, but not necessarily among generic strategies as conventionally thought. Rather, leadership choices revolve around tough decisions on issues that relate both to uniqueness and to efficiency. Rather than either/or, strategic leaders pursuing Quantum strategy think in terms of both/and. Such decisions relate, for example, to how to focus the firm’s offerings and simplify the organization design by removing any process that does not contribute to market orientation and efficient operations. They include how to attract the right people and create an environment where they thrive; how to build aligned value systems and organization designs; and how to remove resource-sapping, aimless bureaucracy and sharpen focus on performance.
SELECTED BIBLIOGRAPHY

Michael Porter advanced his influential ideas on generic strategies and their implementation, as well as the need to make a clear choice among strategies, in *Competitive Strategy* (Free Press, 1980) and *Competitive Advantage: Creating and Sustaining Superior Performance* (Free Press, 1985).


Apple’s financial figures are derived from Apple’s Annual Report for the fiscal year ended 29 September 2012. Performance figures derived from fnapps.forbes.com, figures as of April 2012 (accessed 06.09.12).

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