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# The love-hate relation with innovation – A case of Apple

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## Abstract

Someone rightly said, "Great things have humble beginnings", so did Apple Inc. in the form of a small Los Altos garage where Ronald Wayne, Steve Wozniak and Steve Jobs founded the then Apple Computer Company on 1st April 1976. Today, that Los Altos garage is designated as a historic site in The United States and Apple Inc. has become one of the world's most valuable brands (Madeline Farber, 2017). This rise can be attributed to many factors like suitable business environment, strong management, good investments, innovations etc. In this case study we study the factor of innovation in isolation and its effect on the fortunes of the company.

This case study focuses on the three biggest innovations by the tech giant and the products which were responsible for the innovations and revolutions which followed while making Apple what it is today. The first innovation analyzed here is the "Graphical user interface", which will be studied with the product launches of Lisa and Macintosh in the 1980's. The second innovation analyzed here is the "Applications" with references to VisiCalc, Adobe PageMaker, LaserWriter and iTunes. The third innovation analyzed here is the "iSeries" which will be studied with the product launches of iMac, iPod etc.

This case study comprehensively studies these three innovative benchmarks set by Apple Inc. by detailing the products, their innovative features and commercial & critical aspects. The case study also focuses on the implications of these innovations and products on the company over the past 40 odd years from the time of its inception in 1976.

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**Introduction**

Apple's success story is nothing short of a movie script with all the highs and lows over the past 40 odd years. Today, Apple has grown from a small business in a garage to a leading tech giant corporate. From displaying their computers in small computer clubs to hosting their own keynote events and product launches. Apple has become world's largest information technology company by revenue and the world's second-largest mobile phone manufacturer by volume (Samantha Sharf, 2016). Also, Apple is the second- largest company by market share, with a market share of 14.9% of global smart phone sales (Adam Rogers, 2017). With the launches of next generation iPhone's, iPad's etc. under the leadership of CEO Tim Cook, Apple became the first company to cross the market capitalization of 800 billion $ in May 2017.

Apple started making waves in the Personal Computing industry, soon after its launch in 1976, thanks to its initial technological masterpieces, Apple I and Apple II. But, it was the launch of Apple II in 1977, with which Apple saw unprecedented success. Apple II became one of the first highly successful mass-produced text command microcomputers of that time (iuemag.com). Apple faced their first failure in 1980, in the form of Apple III, due to its various stability issues which meant Apple III had to be re-launched in 1981, which took a hit on Apple's credibility of creating quality products. Apple aimed to strike back with its innovative Graphical User Interface (GUI) based computers in the form of "Lisa" and "Macintosh" in the 1980's. But that too didn't yield positive results. Slowly, after focusing on personal computers for more than a decade, Apple decided to enter the PDA (Personal Digital Assistant) or handheld PC market with "Newton" in 1993, which marked Apple's product timeline with another failure due to its high price and an inefficient key feature of "handwriting recognition". After the 2000's, Apple grew from strength to strength as it shifted its focus to consumer electronics and to signify the same, Apple dropped 'Computer' from its name in 2007 and came to be known as "Apple Inc.". This shift resulted in the launch of iconic products like iPod, iPhone, iPad etc. over the years.

Apple Inc. has evolved through incremental as well as radical disruptions of the market over the years with the launch of its innovative products. The innovations at Apple become even more eye-catchy when we learn that Apple spends nearly 3.5% of its revenue on Research and Development, which is way less than what its competitors spend. Google spends 15% of revenue while Facebook spends 22% of its revenue on Research and Development (Buster Hein, 2015) and yet Apple continues to be one of the most innovative companies in the world (bcg.com, 2017). Exhibit 1 shows the impact of the innovations considered in the case, on the sales of the products which lie under the bracket of the respective innovations. [Refer Exhibit I]

**Innovations that made Apple:**

●      Graphical User Interface

Graphical User Interface (GUI) can be defined as "an interface which allows the user to interact with electronic devices with the help of icons and visual indicators" (Computer Hope, 2017). GUI was the step forward from the text-based systems of that time, which required the user to learn manual commands to perform any kind of action in the computer, thus making the process of operating a computer complicated. GUI changed the way we see a personal computer by making the interaction between the user and the computer easy, compact,

attractive and more importantly more personal than before with the development of a revolutionary pointer device called "Mouse".

Apple brought GUI into the mainstream with the launch of "Lisa" and "Macintosh" line of computers in 1983 and 1984 respectively. The major part of innovation of GUI is often credited to Xerox. The first electronic device to use a GUI is Xerox's Alto which was developed at Xerox's Palo Alto Research Center (PARC). Apple developed key interest in GUI when co-founder Steve Jobs visited the Xerox PARC facility with other key Apple employees in 1979. After some negotiations, Xerox granted Apple engineers three days of access to the PARC facilities in return of the option to buy 1,00,000 shares (8,00,000 split-adjusted shares) of Apple at the pre-IPO (Initial Public Offering) price of $10 per share. As a result of the visit, Apple decided to build its own GUI, ultimately leading to the launch of Apple's first GUI based computer 'Lisa' in January 1983.The GUI was not innovated by Apple but Apple as a company was an early identifier of such innovative advancement in the market at that time. Apple as a company decided to develop a similar GUI as that of Alto with some major changes in the operating model. Hence, such innovation can be interpreted as being aware about innovation pattern in the industry. Lisa's GUI inspiration, can also be termed as 'new innovation' for the consumers as XEROX Alto's production was limited to 1,500 units out of which 1,000 were used by XEROX employees itself. Hence, Lisa was the first commercially produced computer to incorporate a GUI and mouse. Lisa is often termed as a disruptive innovation as it aimed at the existing market of business users with a new set of technology. Even though 'Lisa' was a technically superior machine, it was a commercial failure as it registered a poor sale of 1,00,000 units which was way less than what Apple and the industry had expected after the humongous success of Apple II, which recorded an aggregate sale of 6 million units and a life-run of 14 long years (infinityredefined.com). The major reasons for Lisa's failure were, First, a price tag of 9,995$, which was way out of reach of individual users at that time. Secondly, after the failure of Apple III in 1980, Apple as a company needed a computer aimed at household market just like Apple II, but the launch of 'Lisa' meant the launch of a higher priced machine and to add to all the misery Lisa was found to have some efficiency issues which did not justify its high price tag, leading to disappointing sales. The failure of Lisa meant that IBM's less effective but cheaper computers continued to dominate the market (Bryan Gardiner, 2008). BYTE magazine said reviewing Lisa that "it is the most important development in computers in the last five years, easily outpacing [the IBM PC]" and further added that "Apple ... is not unaware that most people would be incredibly interested in a similar but less expensive machine. We'll see what happens" (Gregg Williams, 1983).

With the consecutive failures of 'Apple III' and 'Lisa' at the back, many believed "Macintosh"- a better performing machine at a less expensive price, aimed at the consumer market was exactly what Apple as a company needed. Macintosh went through steady amount of changes due to the internal conflicts between Steve Jobs and Jeff Raskin (initial head of development of Macintosh) which resulted in the debut of Macintosh on January 1984, a year later the launch of Lisa. Macintosh was innovative on two fronts -

1.      Marketing - Apple had invested huge amount of resources in 'Macintosh' in the form of Research & Development and a pricy Super Bowl advertisement, directed by filmmaker Ridley Scott, which still finds mentions in the "best advertisement ever" lists (UK TV Adverts, 2000). The advertisement did not show the product 'Macintosh', instead it was presented as a savior of the world which would otherwise be dominated by the 'Big Brother' - IBM.

2.       Product -. Macintosh was an upgraded version of Lisa with similar features and advancements like GUI and mouse. But with the addition of two other applications, which exploited its graphic capabilities namely 'MacWrite' and 'MacPaint', Macintosh differentiated itself from Lisa.

Initially, 'Macintosh' sold well but it couldn't achieve the numbers it was estimated to achieve. Macintosh sold only 50,000 units in its first quarter, whereas the sales projected sale of 1 million units in the first quarter (Ashleigh Macro, 2014). To meet Apple's objectives then CEO, John Sculley increased the price of Macintosh to 2,495$ from 1,995$ after which it followed the same fate as that of 'Lisa' as sales began to slow down due to the price hike and lack of software titles. To add to the problems the machine was found to be not as powerful as it was expected to be. Isaacson wrote about Macintosh saying, "The problem was a fundamental one: It was a dazzling but woefully slow and underpowered computer, and no amount of hoopla could mask that" (Chris O'Brien, 2014). Macintosh was not the biggest of the successes for Apple, but it gave Apple a brand that would go on for years and would mean innovation every time it showed up in its product timeline.

The launch of Lisa and Macintosh was a result of internal competition inside Apple. With latest technology in the form of GUI and mouse at their disposal, both Lisa and Macintosh team, competed to become the first commercially produced GUI computer. While, Lisa aimed at high-end business users, Macintosh aimed at the consumer segment similar to that of its predecessor Apple II. Hence, the idea of innovation came externally while the development of innovation came from the work-culture that Apple followed at that time in the form 'Team competition'.

The innovation of GUI meant the death of text-based computers and the beginning of a new age of computers not only for Apple but for the whole world. With all the developments in the computing space, GUI continues to be the basis and foundation to many of them. Today, GUI has become an inseparable part of computing, consumer electronics and the whole technology world.

●       **Applications**

 Applications were the driving forces of technology of the past, they are for the present and they will be for the future. Innovative applications have driven the sales of Apple's products starting with Apple II in 1977 till today with various inbuilt/ add-on applications for iPhone's, iPad's etc. The applications analyzed here are VisiCalc, Adobe PageMaker, LaserWriter and iTunes which were launched along with Apple products like Apple II, Macintosh etc. These applications shaped the products and the company in a big way and at a time when there was no basis or framework for their development. These applications made the products more attractive with their addition to them, which in some form or the other are used even in the present age.

 **VisiCalc**

VisiCalc was launched in the year 1979, two years after the launch of Apple II. It was developed by Dan Bricklin and Bob Frankston of Software Arts Company. Bob Frankston described VisiCalc as a "magic sheet of paper that can perform calculations and recalculations" (Tiller HQ, 2016). The innovation of VisiCalc is even more special as it was first of its kind application, like today's 'Excel' or 'Spreadsheet' programs which made households and businesses to function way easier than before. Antic reviewing VisiCalc said, "It can be used

to balance your checkbook, keep track of credit card purchases, calculate your net worth, do your taxes—the possibilities are practically limitless" (Atari Magazines, 1984). With VisiCalc's growing popularity as a software tool, Apple II incorporated Visicalc in its systems. The advanced functions of VisiCalc made Apple II attractive to business users leading to an exceptional run of Apple II over the years. Ben Rosen speculated in July 1979 that "VisiCalc could someday become the software tail that wags (and sells) the personal computer dog". Many individuals bought a $2000 Apple II to run a $100 VisiCalc (Computer World, 1999). Leading this VisiCalc was termed as a "killer app", where "killer app" can be defined as "an application that consumers would buy the (usually expensive) hardware just to run that application" (PC Mag). VisiCalc expanded to other machines over the years after its launch with Apple II. As a result, it sold over 7,00,000 copies in six years, and approximately 1 million copies over its lifetime. This was an innovative association from Apple's end which powered the sales of its products.

**Adobe PageMaker & LaserWriter**

Adobe PageMaker and LaserWriter were the "VisiCalc" to Macintosh computers, both these applications were launched in 1985 a year after Macintosh's launch in 1984. PageMaker was developed by Aldus, but it came to be known as "Adobe PageMaker" after Adobe purchased Aldus in 1994. PageMaker was the first desktop publishing application which single-handedly created the desktop publishing (DTP) industry with its launch. PageMaker was used to create brochures, flyers, newsletters, reports and a variety of other professional-quality documents which were used for both business and educational purposes, which otherwise were hand-made or required special skills. PageMaker exploited the GUI of Macintosh to include different designs, fonts and layouts. BYTE magazine speaking about PageMaker 3.0 stated that it "is the program that showed many of us how to use the Macintosh to its full potential" (BYTE Magazine, 1989). It drove the sales of Macintosh with the support of Apple's LaserWriter which further expanded the horizons of the DTP industry. LaserWriter was first of its kind laser printer which used Adobe's Postscript to print the documents created through PageMaker. Even though LaserWriter was a costly bet for many at that time, the per unit cost came down as a single LaserWriter could be connected to as many as sixteen Macintosh's with the help of AppleTalk network protocol. Like that of VisiCalc, the boost to the sale of Apple products came from an innovative association between Apple, Adobe and Aldus which created an entirely new industry.

**iTunes**

iTunes was launched at Mac World San Francisco in 2001, and it played the role of a catalyst in the revival of Apple, after the failure of Newton in 1993. iTunes was a result of Apple's acquisition of Sound Jam MP in 2000 developed by Bill Kincaid. iTunes created a market where the users not only wanted to play music, videos etc. but also own them by buying the songs, videos etc. iTunes was a path breaking innovation because of many reasons, First, it debuted at a time when popular applications like 'Napster' which supported peer to peer sharing of files using the internet were facing lawsuits from the whole music industry. As a result, a court decided in 2001 to shut down 'Napster' - "saying the online company encourages "wholesale infringement" against music industry copyrights". Secondly, A standard pricing policy of all songs in iTunes at 0.99$ ensured uniformity and ease of access for the user. Apple's press release for iTunes 1.0 said: "iTunes is miles ahead of every other jukebox application, and we hope it's dramatically simpler user interface will bring even more people into the digital music revolution" (Apple, 2001). Apple created history when iTunes store, sold

one million downloads in its first week and took the position as the top music retailer in the world (Lonnie Lazar, 2008). Soon, after the launch of iPod; iPod and iTunes became gold standards of marriage between hardware and software which gave a boost to the sales of iPod over the years. This innovation was a result of an acquisition from Apple's end. Here, the innovation pattern that can be observed is that, not all Apple's innovation is in-house. Apple takes inspiration from the innovative advancement in the industry, for example, GUI & mouse from XEROX Alto and Sound Jam MP. With a foundation for innovation in the form of an inspiration, Apple makes major changes to the same to produce their own version of the innovation at a large-scale. As, Apple taps into niche innovations which have not been commercially exploited, Apple is often represented as the 'original innovator' of various innovations in its products.

- **iSeries**

The "iSeries" line of products has been the face of the company for the past two decades starting with the launch of iMac in 1998. The "iSeries" has changed the company and industry with its innovative product line over the past two decades. Also, it has been the driving force of innovative systems at Apple Inc. The "iSeries" includes a variety of products from smart phones, TV's to software's, applications. The two major products of the "iSeries" analyzed here are 'iMac' and 'iPod' as these were the products of the past which laid foundation for the future products of "iSeries".

The original iMac or iMac G3 and was launched in 1998. It was a result of Apple's decision to streamline its product line and the need to replace its "Macintosh Performa" line of computers. iMac also marked the first product launch after the return of Steve Jobs as interim CEO to Apple after being ousted from the company in 1985. Just like the original Macintosh 128k, iMac was innovative on two fronts namely -

1. Product Innovation - iMac was innovative for its transparent Bondi-blue industrial design by Jonathan Ive, who would later design iPod, iPhone and iPad as well. Steve Jobs said "The back of our computer, looks better than the front of the other guys'. It looks like it's from another planet. A good planet. A planet with better designers". Apart from its appearance it was innovative because it was an "internet ready" computer which allowed the user to easily access internet at a time when the internet was just starting to expand.

2. Marketing Innovation - Apple's "Think Different" advertisement for iMac was another marketing masterstroke, which won the 1998 Emmy Award for 'Best Commercial'. It painted Apple and iMac different from the industry and created the right buzz in the market just before the product launch which lead to impressive sales.

Here, the innovation was a result of a new leadership in place, in the form of Steve Jobs. Steve Jobs major focus has always been to make the products which are more consumer-friendly, which lead to a new design and marketing objective of the company towards its products. Hence, the leadership also has a major effect on innovation culture inside Apple. While under various leaders, Apple's focus seemed to be on management or marketing but under Steve Jobs leadership seemed to focus on innovation. As it has been observed over the years, it is the innovative characteristics of its products that sell its products.

iMac sold nearly 8,00,000 units within its first five months which ensured the success of Apple's comeback product. iMac brought Apple from life support after the company lost 878 million $ in 1997. With the launch of iMac Apple registered its first profitable year in three

years as the company earned a profit of 414 million $ in 1998. The success of iMac resulted in the share prices of the company to go above 40$ per share, for the first time in the past three years. Initially, iMac was criticized for its lack of floppy drives and an unsuitable mouse, The Boston Globe wrote "The iMac doesn't include a floppy disk for doing file backups or sharing of data. It's an astonishing lapse from Jobs, who should have learned better…. The iMac is clean, elegant, floppy-free — and doomed". iMac had shifted from the then standard floppy drives to USB slots for any type of connection, which would become an industry standard in the 2000's. iMac was a perfect example of a modern-day computer with a beautiful design, internet accessibility and a user-friendly computer. After, the start to the iSeries with iMac, Apple got its breakthrough product in the form of iPod.

iPod was launched months after the launch of iTunes in a low-key event in 2001. iPod was an ambitious yet risky project for Apple as it was the first time they were not selling a computer but a music device. The aim to develop a mp3 player which was not clunky and heavy like "Walkman" etc. lead to iPod which was highly appreciated for its simple and lightweight design. iPod was another designing masterpiece by Jonathan Ive, especially for its noteworthy "Click Wheel" design. To shift between songs, + & - volume buttons were used by then mp3 players, But, as iPod was going to involve approximately 1,000 songs this design was not suitable. Hence, "Click Wheel" provided the perfect solution as it allowed the user to easily shift between thousand songs and also allow the user to control volume side by side thanks to a circular design for all control buttons. The buttons in the "Click Wheel" performed basic functions such as menu, play, pause, next track, and previous track. The iPod also included the game "Breakout" which was built by Apple co-founder Steve Wozniak. iPod received positive reviews all around for its good looks, simple interface and the revolutionary "Click Wheel" design. iPod was successful thanks to personalized accessories developed exclusively for iPod like the iconic "white earbud"- earphone. PC World said that the iPod line has "altered the landscape for portable audio players" (Watson & Hill). In the 8 months between March and November 2005, Apple sold 15 million units of iPod which ensured its commercial success and successful expansion of the "iSeries". Leander Kahney said "Someone who got an iPod for Christmas would wander into the Apple Store and start checking out the other products. Next thing you know, they've replaced their old PC with a MacBook. Then they buy an iPhone, then an iPad. So, the iPod has a tremendous 'halo effect' — the halo from the iPod shines a light on Apple's other products. It took a while, but Apple these days is thoroughly mainstream." (Amy May Turner, 2011). iPod changed Apple's target market from niche to mass-scale resulting in a staggering sale of 390 million iPod's. iPod's innovation came from Apple's executives aim to enter the consumer electronics market. Also, the under innovated market of MP3 players at that time provided Apple a perfect opportunity for Apple to take over the MP3 player market and combine its iTunes software with a user-friendly hardware.

**Closing Section**

The Apple-ised formula to success

The success of Apple and its products to some extent can be explained by Schumpeter's theory of Innovations - Innovations which become successful earn exponential profits and the learning by doing theory propounded by Kenneth Arrow. We call this Apple strategy as 'Improvement is innovation' which means innovation is not only about developing an entirely new system, but it is also about improving the existing systems. Apple's success has been in creating revolutionary products (Schumpeter's theory of Innovations) and following it up with minor improvements over the years (learning by doing theory propounded by Kenneth Arrow). For

example, Apple launched iPod in 2001 and followed it up with the next generation of iPod's over the years, till the time they developed another revolutionary product such as iPhone in 2007, which combined the features of an iPod with that of a mobile phone. As a result, Apple kept the consumers satisfied with the improved versions of iPod till they developed a product like iPhone, which could again disrupt the market to their strategic advantage.

**Betrayal of innovation**

The good part about innovation is that it is futuristic & ensures the sustainability of the system and the bad part is that it doesn't guarantee success always (as mentioned in Schumpeter's theory of Innovations). Here the example of 'Apple III' can be taken, which was an innovative computer but also a big commercial failure. It was innovative for its operating system, SOS (Sophisticated Operating System) which allowed creation of third party peripherals plus it offered 512k of RAM, which was a great deal at that time. But, Apple III faltered in every other area of computing leading to its failure. This was a classic case of neglecting the basic functionalities to include the innovative ones. The other innovations which failed for Apple were the ones which were considered way ahead of its time. Here the example of 'Newton', Apple's aim at the PDA (Personal Digital Assistant) market can be discussed. 'Newton' was a tablet-like device with the major innovative feature of 'handwriting recognition'. It was considered way ahead of its time because in the 1990's the personal computing industry was booming and there were no early adopters of such handheld PC's. Also, the feature of 'handwriting recognition' was not effective and has been properly developed only in the past few years with Google launching 'handwriting recognition' for the web with its Google translate service.

Talking about the most commercially exponential innovation by Apple, iPhone is the name that stands out from all other products in the timeline. It was famously launched in the keynote event as "First, a widescreen iPod with touch controls, Second, a revolutionary mobile phone and Third, a breakthrough internet communications device". As a result, iPhone consumed both music and mobile phone market. The highlight of iPhone is that it is an accumulation of all the innovations we discussed like GUI with a multi-touch interface, Applications with the Appstore involving third-party applications and as the flag-bearing product of iSeries.

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