Apple, Inc.:
Strategic Management of Intellectual Property

Patent[x] Case Study 001
William Fisher
August 2020

Contents

Introduction

By any measure, Apple has been an extraordinarily innovative company. Its breakthrough products and services include:

- Apple II computer (1977)
- Macintosh computer (1984)
- Powerbook laptop (1991)
- iMac computer (1998)
- iPod (2001)
- iTunes Store (2003)
- Macbook Pro laptop (2006)
- Apple TV (2006)
- iPhone (2007)
- Macbook Air laptop (2008)
- iPad (2010)
- Siri (2011)
- Apple Watch (2015)

Consumer demand for many of these products and services has been huge, first in the United States, then in the rest of the world.

The typical Apple product contains several layers of innovation. For example, the original Macintosh computer combined (1) an unusual exterior, (2) a mouse, (3) a circuit board, (4) an operating system, (5) a graphical user interface, and (6) several application programs – all of them substantially different from anything previously available to consumers. Apple designed and produced items 1-5. Many of the application programs (item 6) were also designed and produced by Apple, but some were produced by other companies. Most importantly, Excel and Word were created by Microsoft (at the time, also a fledgling company) to run on the Macintosh operating system.

From its inception, Apple has sought and obtained a variety of forms of intellectual property protection for its innovations. Its IP portfolio includes:

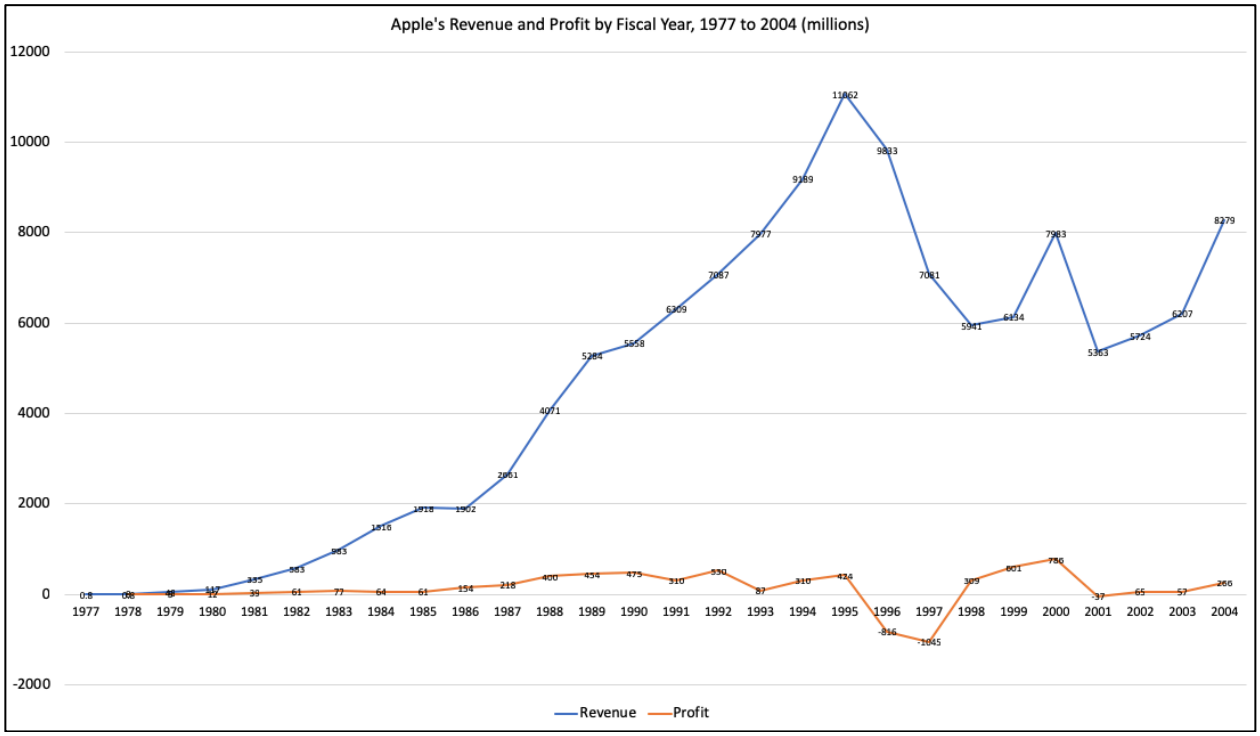
- Trademark protection for the names of its products and services -- and for the many variants of its distinctive logo;
- Copyright protection for its operating systems and application programs;
- Utility Patent protection for its hardware innovations, operating systems, application programs, and aspects of its user interfaces;
- Design Patent Protection for many of the aesthetic aspects of its products;
- Trade dress protection for some of those same aspects.

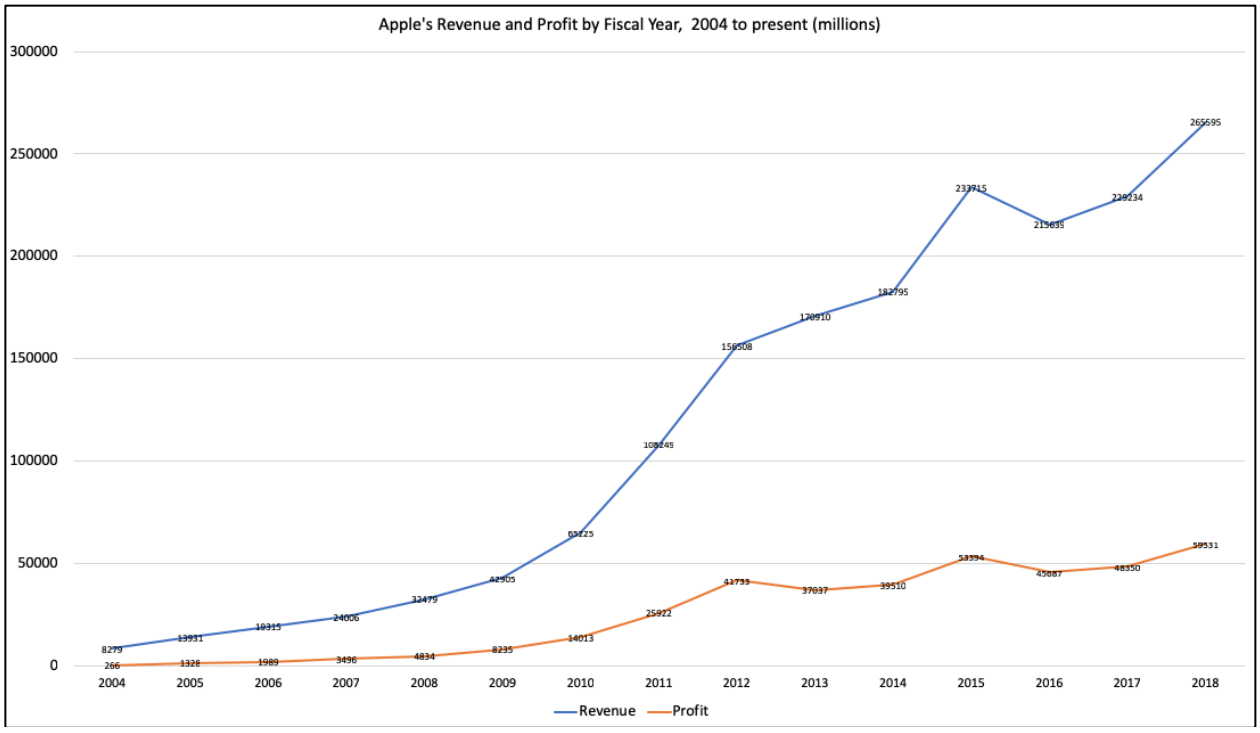
In view of its many strengths, it should not be surprising that Apple is currently the most valuable company in the world. A closer look at the history of the company, however, reveals some puzzles. Looking backward, one can identify four distinct periods in Apple's evolution.

1) An initial period (roughly 1977-1993), when the young company was doing well;
2) A lull (roughly 1993-2004), when the company faltered and nearly went bankrupt;
3) A surge (roughly 2004-2015), in which the company grew extremely rapidly;

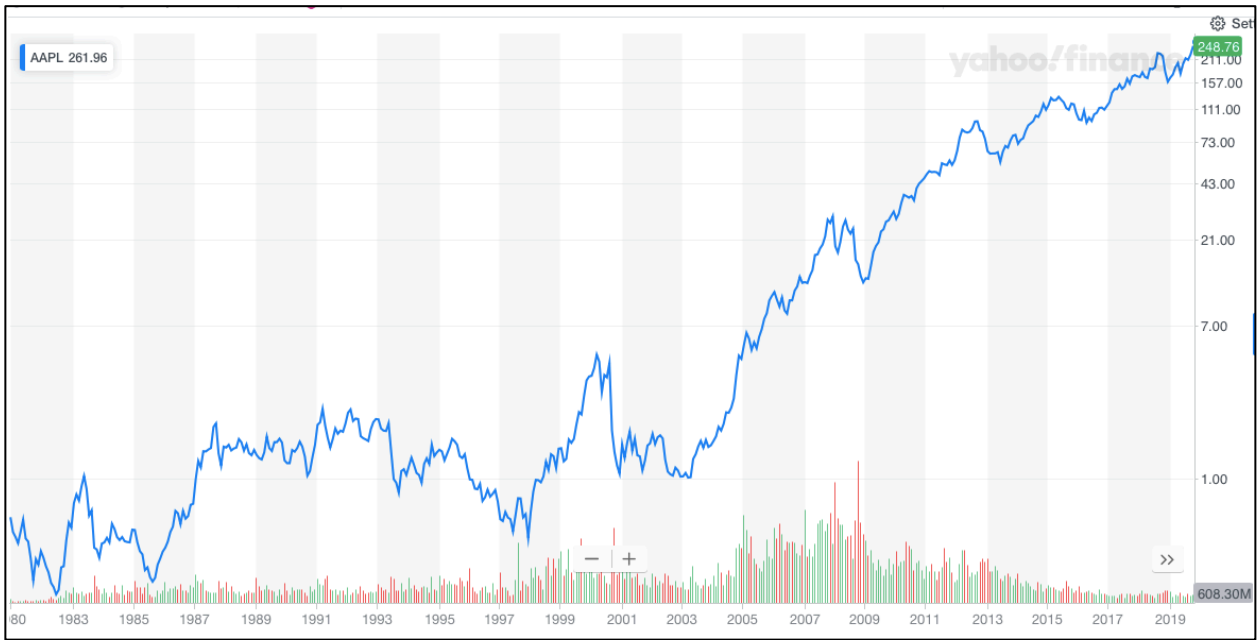
4) A mature phase (roughly 2015 to the present), in which the growth rate has slowed and competitors have proliferated.

This periodization is apparent in the history of the company's revenues and profits:

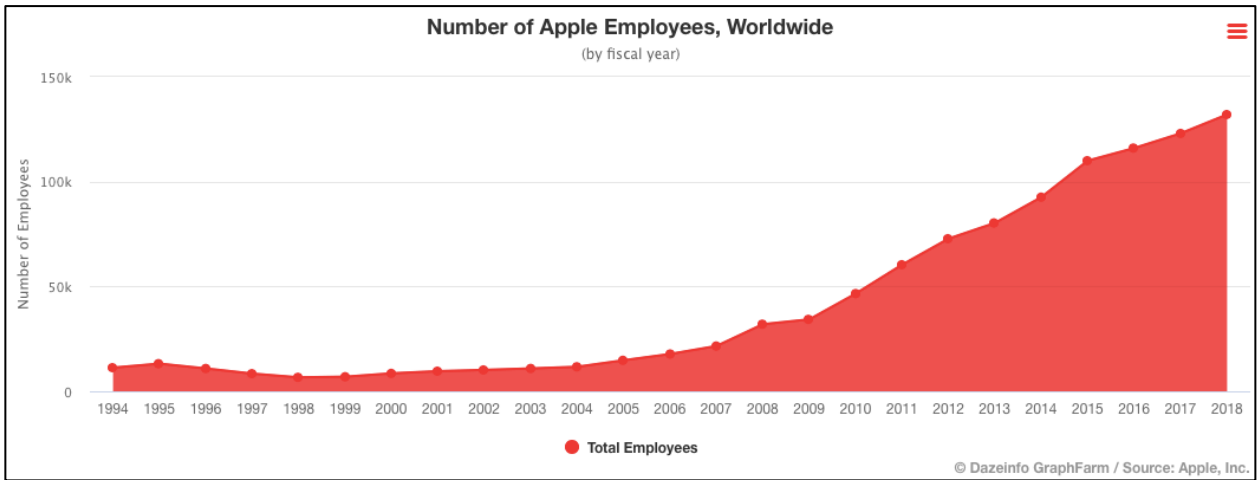




… stock price…



… and number of employees:



Source: https://dazeinfo.com/2019/09/28/number-of-apple-employees-worldwide-graphfarm/

These fluctuations in Apple's performance were produced by a combination of many factors. The principal aspiration of this case study is to distill from the complex history of the company some lessons concerning good and bad strategies with respect to intellectual property.

Set forth below are some materials that be helpful in the process of distillation. After examining them, try to answer the following questions:

(1) What was the source of Apple's success during the first period (1977-1993)?
(2) What lessons concerning strategic uses of intellectual property can be gleaned from Apple's near collapse during the lull (1993-2004)?
(3) What lessons can be gleaned from Apple's revival, beginning in 2004?

(4) What lessons can be gleaned from the fruits of the strategies pursued by Apple's principal competitors and collaborators?
(5) How, if at all, should Apple alter its business model in the future?

I. Timeline

1976: Steve Jobs (a 21-year-old, mercurial, driven, manipulative, ascetic, and self-absorbed visionary) and Steve Wozniak (a 26-year-old, brilliant, generous, and naive electrical engineer and software programmer) form a partnership to create, produce, and sell the Apple I, a pioneering personal computer.

After the successful launch of the Apple I, Wozniak begins work on the Apple II.

Commodore declines Job's offer to buy Apple "for a few hundred thousand dollars," and instead produces and begins to sell the Commodore PET. For a time, its sales exceed those of Apple computers.

1977: To finance and organize the production of the Apple II, a corporation (Apple Computers, Inc.) is formed, which buys out the partnership. Jobs and Wozniak each receive 26% of the shares. Mike Markkula (a precise, cautious former Intel executive) contributes $250,000 and receives 33% of the stock. The remainder is reserved for future investors.

Wozniak develops the hardware and software for the Apple II. Jobs is increasingly focused on industrial design and marketing. Jobs hires Regis McKenna to develop a new logo for the company and to handle advertising for the Apple II. The release of the Apple II is well received.

Markkula hires Michael Scott (a tense manufacturing executive with National Semiconductor) as President, primarily to oversee Jobs. Jobs reluctantly acquiesces.

1978: Wozniak continues to refine the Apple II. Visicalc (one of the first spreadsheet programs) is designed to run on it. The initial retail price of the Apple II is $1,298. Sales are strong.

1979: Jobs allows Xerox to invest $1M in Apple (i.e., buy 100,000 shares for $10 apiece); in return, Xerox permits Jobs and the Apple team to see the details of Xerox PARC's recently developed mouse-controlled, pixel-based "graphical user interface" (GUI). Jobs immediately begins developing software that will replicate and then improve the interface.

1980: The Apple III, an updated version of the Apple II, flops, in part because it is prone to damage through overheating (a byproduct of Jobs' hostility to fans, which he believes impair the user's experience). However, sales of Apple II, particularly to businesses, continue to expand. Hundreds of application programs are written to run on the Apple II.

Jobs initiates development of the "Lisa" (a new computer line, named for his daughter, whom he had abandoned).

In December, Apple goes public. Initial offering: 4.6 million shares at $22 apiece.

Scott, who has become increasingly ineffectual, is ousted as President; Markkula takes over.

1981: Partly to curb Jobs' disruptive managerial style, Markkula engineers a reorganization: Jobs loses control of the Lisa project and his title as Vice President for Research and Development; instead, he is appointed non-executive Chairman of the Board.

Jobs become involved in and later takes control of the Macintosh initiative, an ongoing minor development project, originally intended to produce an inexpensive computer "for the masses." Jobs reorients the project toward the production of "an insanely great machine."

IBM launches the Personal Computer (PC). It uses a microprocessor produced by Intel and an operating system (DOS) produced by Microsoft. The retail price of the base version is $1,565. PC sales initially lag those of the Apple II, but gradually rise.

1982: Development of the Macintosh continues. "Clones" of the IBM PC, also running the Microsoft operating system, begin to proliferate. Prices of the clones decline.

Mike Murray (Apple's marketing director) proposes to license the Apple II operating system to Tandy and other computer manufacturers; Jobs refuses.

During the year, 279,000 Apples IIs are sold; 240,000 PCs and PC-clones are sold.

1983: The "Lisa" is launched (retail price: $9,995), but is a commercial failure. Markkula, who has tired of the responsibilities of President, recruits John Sculley (a former Pepsi marketing executive with no knowledge of computers) to replace him. Jobs and Sculley initially work together cooperatively, but their relationship later sours.

Over Jobs' objections, Sculley sets the retail price of the Macintosh at $2,495.

During the year, 420,000 Apples IIs are sold; 1,300,000 PCs and PC-clones are sold.

1984: In January, the Macintosh is launched to critical acclaim. The "1984" Superbowl advertisement, commissioned by Jobs but resisted by Apple's board, proves effective. Sales of the Macintosh are initially very strong but then weaken, partly because of the slow speed of the microprocessor, partly because of the limited set of compatible software.

1985: Microsoft releases Windows 1.0, an operating system featuring a GUI based loosely on the Apple GUI, designed to run on PCs and PC clones. Reviews are lukewarm.

Jobs, discouraged by disappointing sales of the Macintosh, becomes increasingly erratic and abusive of Apple employees. Sculley and the Board of Directors force him to relinquish control of the Macintosh project.

Deprived of meaningful authority, Jobs leaves Apple, accompanied by five senior executives. At the time, his Apple stock is worth $100 million. He sells all but one share.

During the next several years, Jobs runs two companies: NeXT, which develops an expensive and powerful computer aimed at the academic market; and Pixar, which develops and then implements technology for computer animation. NeXT fails to sell a significant number of computers, but develops an improved operating system, which Jobs is ultimately able to sell to Apple. Pixar initially stumbles, but then strikes a deal with Disney to produce *Toy Story*, an innovative and commercially successful animated film. The subsequent IPO of Pixar earns Jobs more money than he earned at Apple.

1987: Apple's share of the personal-computer market begins to decline, but its prices remain high – as does its profit margin (around 50%).

Wozniak leaves Apple.

Microsoft releases Windows 2.0.

1987-1993: Apple introduces several variants of the Macintosh computer, including the Mac SE, Mac II, Mac Portable, Mac Classic, Mac LC, Powerbook, Quadra, Centris, and Performa.

The market for personal computers grows rapidly. However, Apple's share of that market continues to fall, and its profit margin declines somewhat. As the share of the market held by PCs and PC clones (now sometimes called "Wintel computers") grows, the prices of those computers decline, and the profit margins of most of their manufacturers drop below 5%.

Apple continues to spend roughly 8% of its revenue on research and development, while PC makers spend roughly 1%.

1993: Apple launches the Newton, the first digital personal assistant.

Dissatisified with the company's performance, the Board replaces Sculley with Michael Spindler as CEO. Markkula returns to the company as Chairman of the Board.

1996: Gil Amelio (a member of the Board) becomes Chairman and CEO. Amelio repudiates Sculley's short-lived strategy of trying to compete with PCs on price – and reinstates the strategy of pricing Apple's products well above its rivals.

Amelio initially disdains Jobs, but eventually agrees to purchase the NeXT operating system. As part of the deal, Jobs is given a vaguely defined advisory position in Apple. His role in the company then gradually expands.

1997: Jobs engineers the ouster of Amelio and soon thereafter accepts the position of "interim CEO."

Jobs negotiates a deal with Bill Gates, under which Microsoft agrees to invest $150 million in Apple and commits to developing software (including the Office suite) for the Macintosh.

Jobs reduces to 4 the number of Apple's product lines and creates a website to sell products directly to consumers.

1998: Jobs hires Tim Cook (former executive at IBM and Compaq) as Chief Operating Officer.

2000: Apple introduces the iMac, a colorful, inexpensive, all-in-one computer that includes a CD-drive. List price is $1,299. Sales are brisk.

Apple develops iTunes, a music-management application. It is originally designed to run only on iMacs and other Macintosh computers.

Jobs drops the "interim" in his title and becomes CEO.

2001: Apple releases OSX, an improved operating system, based on UNIX and the NeXT operating systems.

Apple releases the iPod, a portable digital audio player with a 5-gigabyte hard drive. It is designed to "synch" quickly with a Macintosh computer, where the user would use iTunes to store her music library, create playlists, etc. In subsequent years, Apple releases many variants of the iPod, with gradually increasing storage capacity.

Apple begins to sell its products through its own retail stores (designed primarily by jobs); eventually 15% of the company's revenues will be derived from in-store sales.

2002: Jobs persuades the executives of the major recording companies to permit him to sell copies of their recordings through an online store.

2003: The iTunes Music Store is opened to considerable fanfare. The price for most recordings is $0.99. Initially, the recordings are protected by a digital-rights-management system, which limits the number of copies that the purchaser can make. One of arguments that Jobs uses to persuade the executives is that the service will only be available to Macintosh owners, who form a small percentage of computer owners. However, Jobs' lieutenants soon persuade him to develop a version of iTunes that runs on the Windows platform, which makes the service available to the owners of Wintel computers. Downloads from the store exceed expectations.

Jobs is diagnosed with pancreatic cancer. For 9 months, he eschews western medicine and relies on alternative therapies, a decision that likely hastens his death.

2006: Apple switches to the faster, more efficient Intel processors to run its computers.

2007: Apple introduces the iPhone, which combines many functions in a single portable device controlled by a touch screen. In subsequent years, many versions of the product are released, with gradually increasing functionality.

2008: The media available through the iTunes Store increases sharply. Movies can now be rented or purchased through the store. In addition, owners of Apple computers and portable devices can download applications designed to run on their products. Third-party developers of applications are encouraged to apply to Apple for permission to sell their products through the store, but Apple reserves the right to refuse admission. Apple keeps 30% of the revenue generated by sales of third-party applications through the store.

2009: Samsung releases the Galaxy smartphone, modeled closely on the iPhone. Sales are brisk.

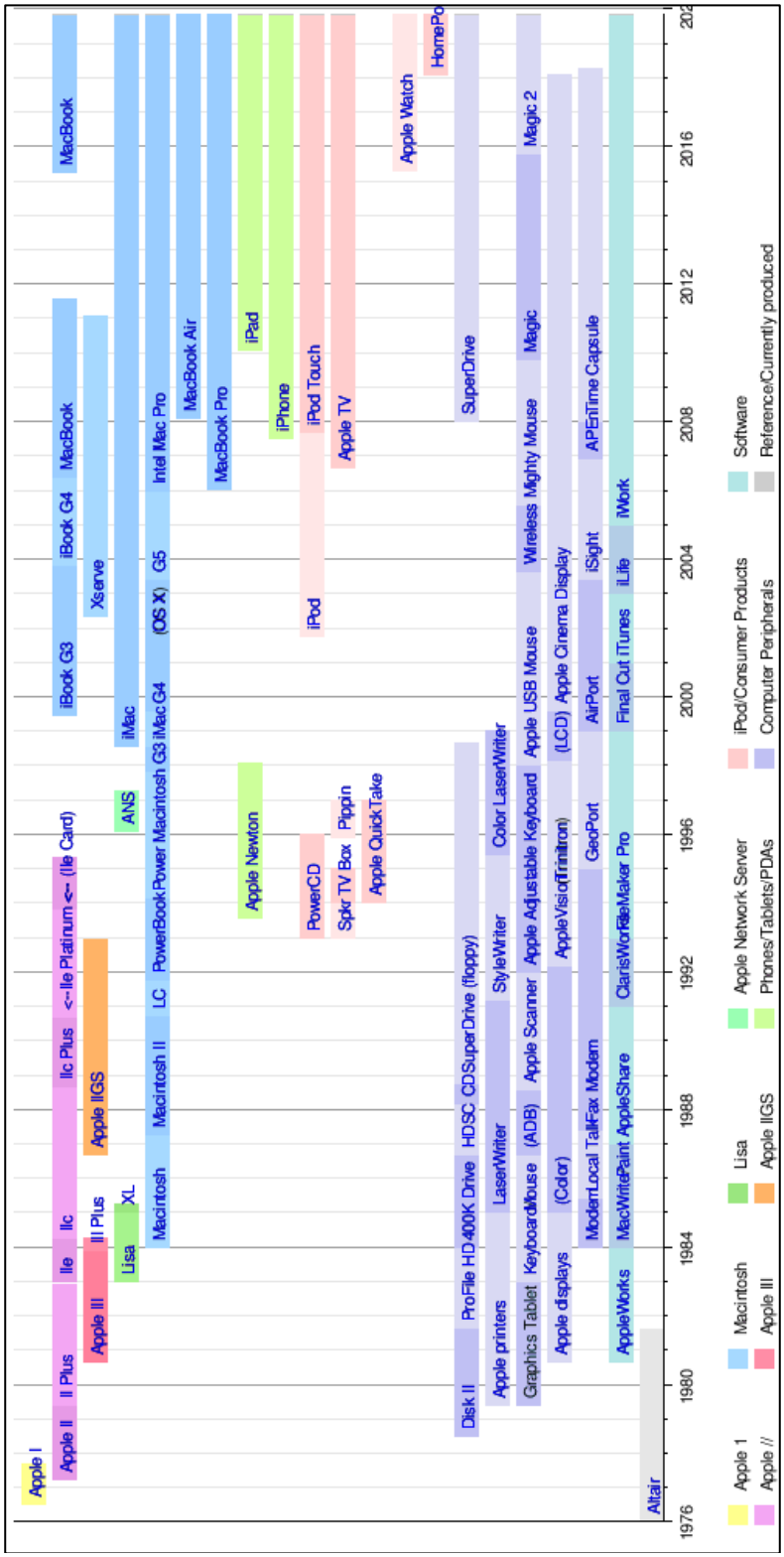
The digital-rights-management system is removed from all copies of sound recordings sold through the iTunes Music Store.

2010: Apple releases the iPad, a tablet midway between a laptop computer and a smartphone.

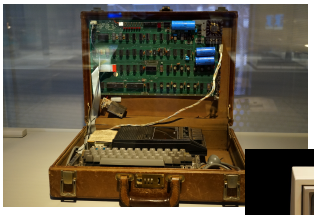
2011: Jobs resigns as CEO. Tim Cooks takes his place. A few months later, Jobs dies of pancreatic cancer.

2015: Apple releases the Apple Watch. Reviews are mixed.

II. Selected Products



Source: https://en.wikipedia.org/wiki/History_of_Apple_Inc.



Apple I (1976)

Apple II (1977)

MacIntosh II (1987)

MacIntosh (1984)

Powerbook 100 (1991)

Powerbook 540C 1994

Power MacIntosh G3 1997

Powermac G4 1999

Powerbook G4 2001

Ipod (2001)

Ipod Nano (2005)

Iphone (2007)

Macbook (2006)

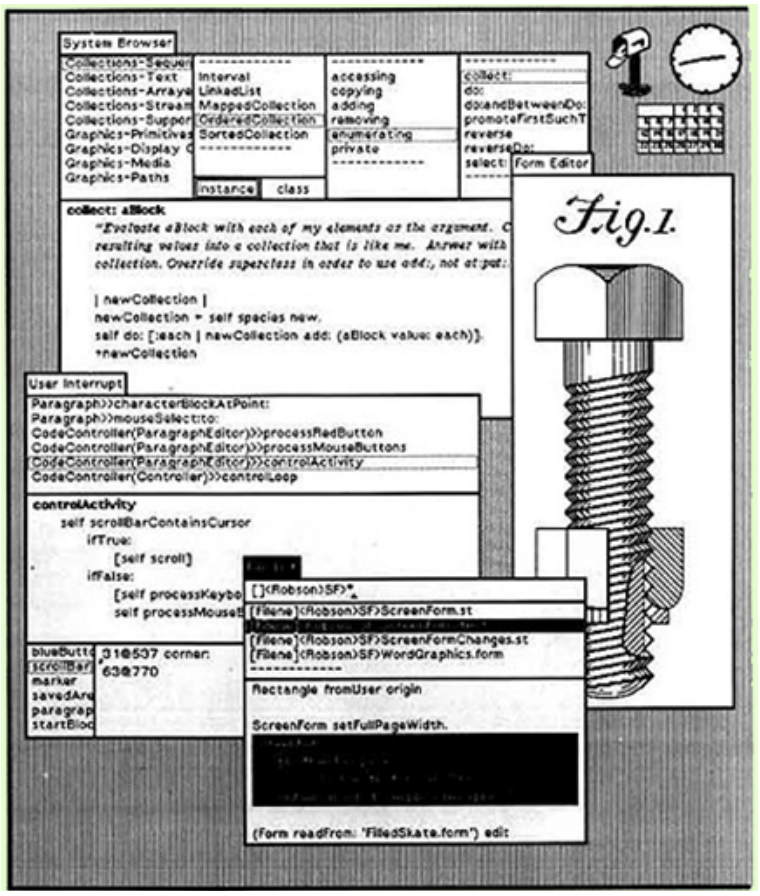
Macbook Air (2008)

Macbook Pro (2008)

(A poster showing every Apple product released between 1976 and 2014 is available at https://www.complex.com/style/2014/11/poster-of-every-apple-product-ever.)

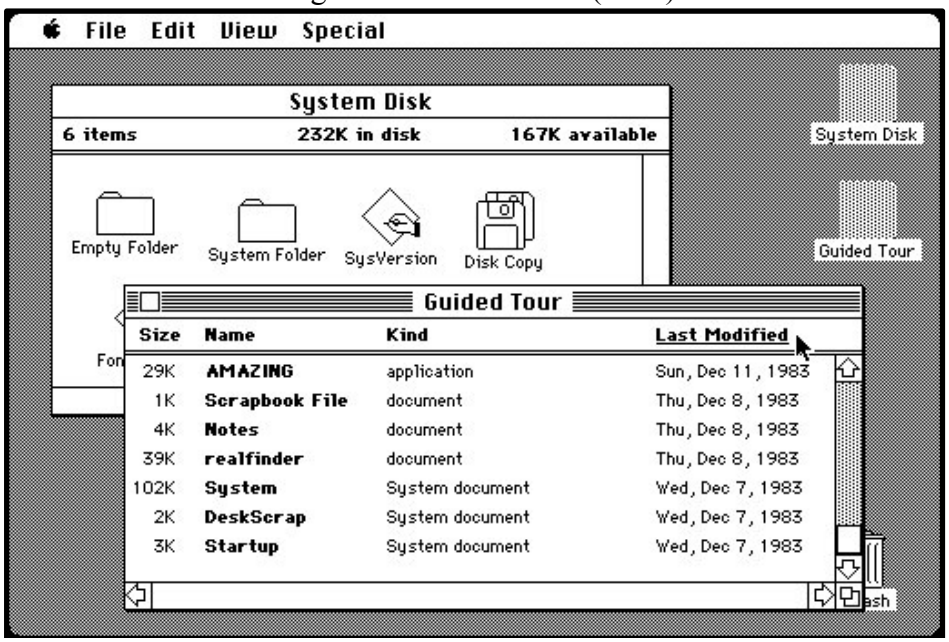
III. Graphical User Interfaces

Xerox Alto

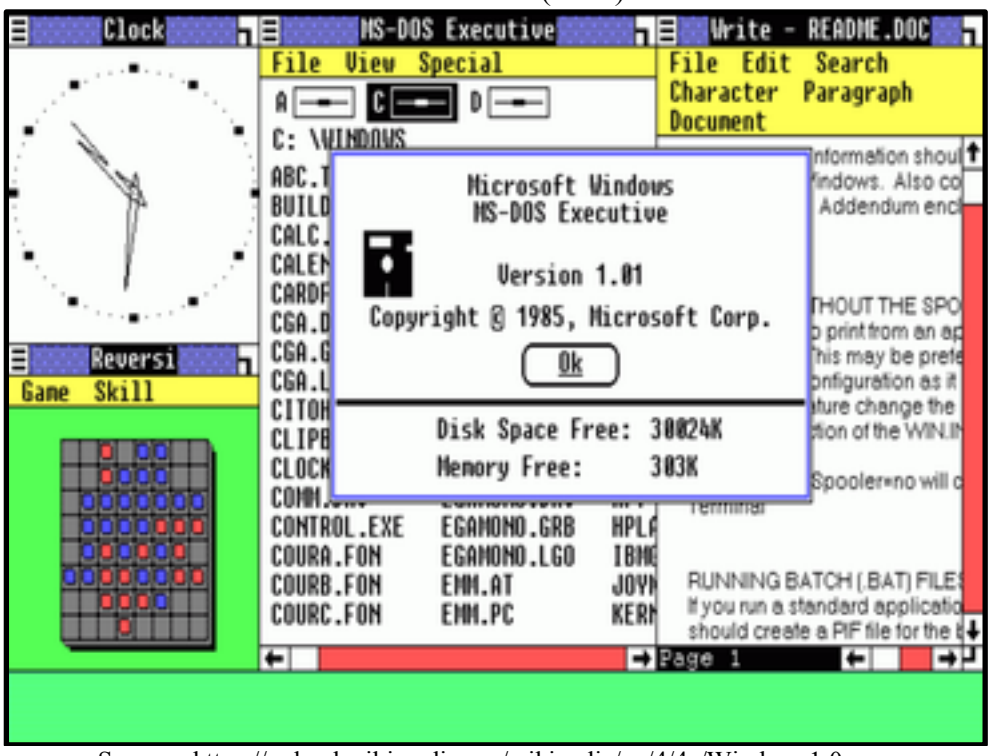


Source: http://www.opentextbooks.org.hk/ditatopic/10178

Original Macintosh GUI (1984)

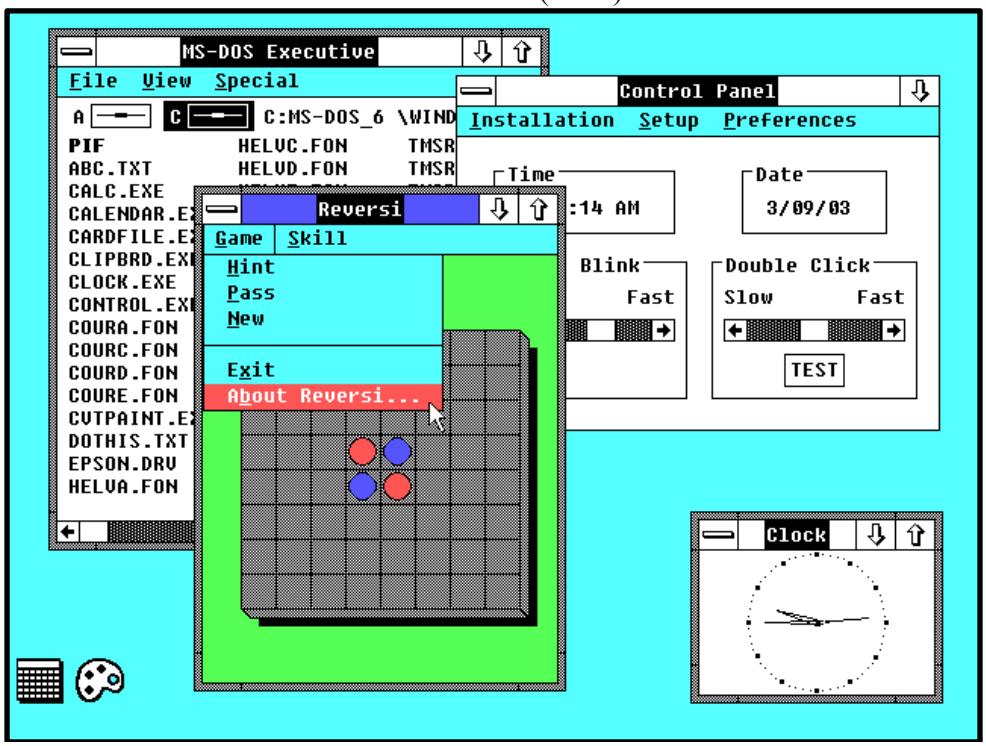


Windows 1.0 (1985)



Source: https://upload.wikimedia.org/wikipedia/en/4/4e/Windows1.0.png

Windows 2.0 (1987)



IV. Selected Intellectual Property

United States Patent **4,136,359**
Wozniak **January 23, 1979**

Microcomputer for use with video display

Abstract

A microcomputer including a video generator and timing means which provides color and high resolution graphics on a standard, raster scanned, cathode ray tube is disclosed. A horizontal synchronization counter is synchronized at an odd-submultiple of the color subcarrier reference frequency. A "delayed" count is employed in the horizontal synchronization counter to compensate for color subcarrier phase reversals between lines for the non-interlaced fields. This permits vertically aligned color graphics without substantially altering the standard horizontal synchronization frequency. Video color signals are generated directly from digital signals by employing a recirculating shift register.

Inventors: **Wozniak; Stephen G.** (Cupertino, CA)
Assignee: **Apple Computer, Inc.** (Cupertino, CA)
Family ID: **25137868**
Appl. No.: **05/786,197**
Filed: **April 11, 1977**

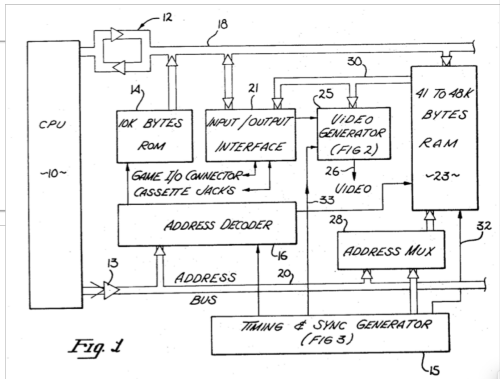


Fig. 1

United States Patent **D268,584**
Jobs , et al. **April 12, 1983**

Personal computer

Claims

The ornamental design for a personal computer, substantially as shown.

Inventors: **Jobs; Steven P.** (Los Gatos, CA), **Manock; Jerrold C.** (Palo Alto, CA), **Hovey; Dean A.** (Los Altos, CA), **Kelley; David M.** (Palo Alto, CA)
Assignee: **Apple Computer, Inc.** (Cupertino, CA)
Appl. No.: **06/203,502**
Filed: **November 3, 1980**

Current U.S. Class: **D14/333**
Current International Class: D1402
Field of Search: ;D14/100,101,102,103,105,106,107,111,113,114 ;364/419,708,709,900 ;340/365R ;D18/7


Fig. 1

United States Patent **D285,687**

Manock , et al. *** September 16, 1986**

****Please see images for: (Certificate of Correction) ****

Computer housing

Claims

The ornamental design for a computer housing, substantially as shown.

Inventors: **Manock; Jerrold C.** (Palo Alto, CA), **Oyama; Terrell A.** (Los Altos, CA), **Jobs; Steven P.** (Los Gatos, CA)

Assignee: **Manock; Jerrold C.** (CA)

[*] Notice: The portion of the term of this patent subsequent to September 16, 2000 has been disclaimed.

Appl. No.: **06/541,714**

Filed: **October 13, 1983**

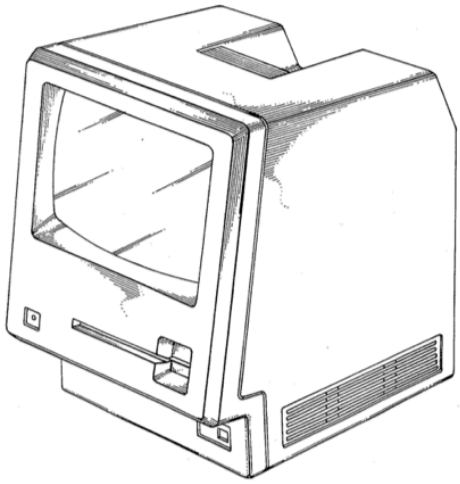


Fig. 1

(12) **United States Patent**
Ording

(10) **Patent No.: US 7,469,381 B2**
(45) **Date of Patent: Dec. 23, 2008**

(54) **LIST SCROLLING AND DOCUMENT TRANSLATION, SCALING, AND ROTATION ON A TOUCH-SCREEN DISPLAY**

(75) Inventor: **Bas Ording**, San Francisco, CA (US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/956,969**

(22) Filed: **Dec. 14, 2007**

What is claimed is:

19. A device, comprising:

a touch screen display;

one or more processors;

memory; and

one or more programs, wherein the one or more programs are stored in the memory and configured to be executed by the one or more processors, the programs including:

instructions for displaying a first portion of an electronic document;

instructions for detecting a movement of an object on or near the touch screen display;

instructions for translating the electronic document displayed on the touch screen display in a first direction to display a second portion of the electronic document, wherein the second portion is different from the first portion, in response to detecting the movement;

instructions for displaying an area beyond an edge of the electronic document and displaying a third portion of the electronic document, wherein the third portion is smaller than the first portion, in response to the edge of the electronic document being reached while translating the electronic document in the first direction while the object is still detected on or near the touch screen display; and

instructions for translating the electronic document in a second direction until the area beyond the edge of the electronic document is no longer displayed to display a fourth portion of the electronic document, wherein the fourth portion is different from the first portion, in response to detecting that the object is no longer on or near the touch screen display.

(12) **United States Patent**
Platzer et al.

(10) **Patent No.: US 7,844,915 B2**
(45) **Date of Patent: Nov. 30, 2010**

(54) **APPLICATION PROGRAMMING INTERFACES FOR SCROLLING OPERATIONS**

(75) Inventors: **Andrew Platzer**, Santa Clara, CA (US); **Scott Herz**, Santa Clara, CA (US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 583 days.

(21) Appl. No.: **11/620,717**

(22) Filed: **Jan. 7, 2007**

What is claimed is:

8. A machine readable storage medium storing executable program instructions which when executed cause a data processing system to perform a method comprising:

receiving a user input, the user input is one or more input points applied to a touch-sensitive display that is integrated with the data processing system;

creating an event object in response to the user input;

determining whether the event object invokes a scroll or gesture operation by distinguishing between a single input point applied to the touch-sensitive display that is interpreted as the scroll operation and two or more input points applied to the touch-sensitive display that are interpreted as the gesture operation;

issuing at least one scroll or gesture call based on invoking the scroll or gesture operation;

responding to at least one scroll call, if issued, by scrolling a window having a view associated with the event object; and

responding to at least one gesture call, if issued, by scaling the view associated with the event object based on receiving the two or more input points in the form of the user input.

(12) **United States Design Patent**
Anzures et al.

(10) **Patent No.: US D604,305 S**
(45) **Date of Patent: ** *Nov. 17, 2009**

(54) **GRAPHICAL USER INTERFACE FOR A DISPLAY SCREEN OR PORTION THEREOF**

(75) Inventors: **Freddy Anzures**, San Francisco, CA (US); **Imran Chaudhri**, San Francisco, CA (US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

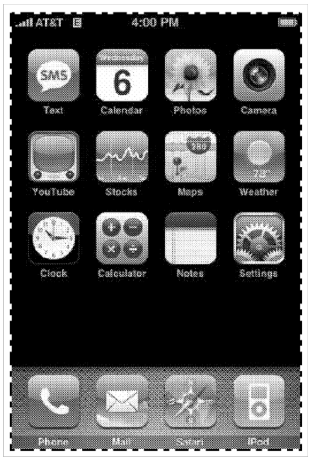
(**) Term: **14 Years**

(21) Appl. No.: **29/281,460**

(22) Filed: **Jun. 23, 2007**

(57) **CLAIM**

The ornamental design for a graphical user interface for a display screen or portion thereof, as shown and described.



(12) **United States Design Patent**
Andre et al.

(10) **Patent No.: US D618,677 S**
(45) **Date of Patent: ** *Jun. 29, 2010**

(54) **ELECTRONIC DEVICE**

(75) Inventors: **Bartley K. Andre**, Menlo Park, CA (US); **Daniel J. Coster**, San Francisco, CA (US); **Daniele De Iuliis**, San Francisco, CA (US); **Richard P. Howarth**, San Francisco, CA (US); **Jonathan P. Ive**, San Francisco, CA (US); **Steve Jobs**, Palo Alto, CA (US); **Duncan Robert Kerr**, San Francisco, CA (US); **Shin Nishibori**, Portola Valley, CA (US); **Matthew Dean Rohrbach**, San Francisco, CA (US); **Douglas B. Satzger**, Menlo Park, CA (US); **Calvin Q. Seid**, Palo Alto, CA (US); **Christopher J. Stringer**, Woodside, CA (US); **Eugene Antony Whang**, San Francisco, CA (US); **Rico Zorkendorfer**, San Francisco, CA (US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(*) Notice: This patent is subject to a terminal disclaimer.

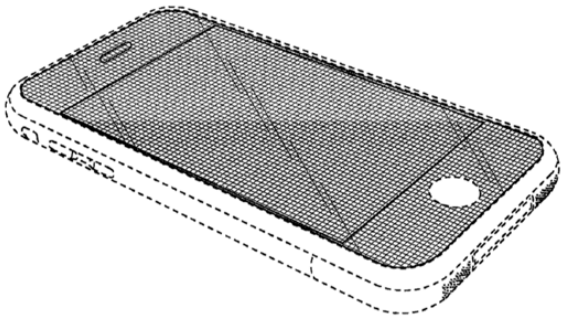
(**) Term: **14 Years**

(21) Appl. No.: **29/328,018**

(22) Filed: **Nov. 18, 2008**

(57) **CLAIM**

The ornamental design of an electronic device, as shown and described.



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An Agency of the Department of Commerce

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TSDR FAQ'S

On August 25, 2012, the USPTO released version 2.0 of Trademark Status and Document Retrieval (TSDR). Please send any questions or comments to TSDR@USPTO.GOV. Additional information about the TSDR 2.0 deployment is available here:TSDR 2.0.

Trademark Status & Document Retrieval (TSDR)

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Advanced Search

Status results found

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US Serial Number:	77303282	**Application Filing Date:**	Oct. 12, 2007
US Registration Number:	3470983	**Registration Date:**	Jul. 22, 2008
Register:	Principal		
Mark Type:	Trademark		
Status:	Registered. The registration date is used to determine when post-registration maintenance documents are due.		
Status Date:	Jul. 22, 2008		
Publication Date:	May 06, 2008		

- Mark Information — Expand All
- Related Properties Information
- Goods and Services
- Basis Information (Case Level)
- Current Owner(s) Information
- Attorney/Correspondence Information
- Prosecution History

V. Advertisements

Apple II Print Ad (1977) (page 1) (Source: http://www.macmothership.com/gallery/gallery1.html):

(Page 2)

The home computer that's ready to work, play and grow with you.

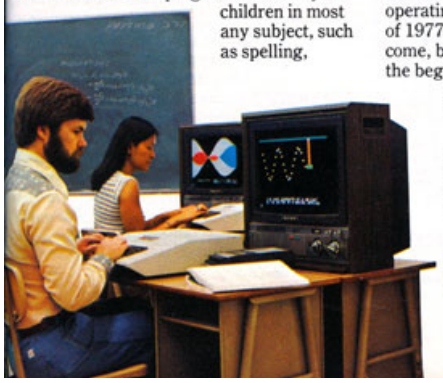
Clear the kitchen table. Bring in the color T.V. Plug in your new Apple II,* and connect any standard cassette recorder/player. Now you're ready for an evening of discovery in the new world of personal computers.

Only Apple II makes it that easy. It's a complete, ready to use computer—not a kit. At $1298, it includes features you won't find on other personal computers costing twice as much.

Features such as video graphics in 15 colors. And a built-in memory capacity of 8K bytes ROM and 4K bytes RAM—with room for lots more. But you don't even need to know a RAM from a ROM to use and enjoy Apple II. It's the first personal computer with a fast version of BASIC—the English-like programming language—permanently built in. That means you can begin running your Apple II the first evening, entering your own instructions and watching them work, even if you've had no previous computer experience.

The familiar typewriter-style keyboard makes communication easy. And your programs and data can be stored on (and retrieved from) audio cassettes, using the built-in cassette interface, so you can swap with other Apple II users. This and other peripherals—optional equipment on most personal computers, at hundreds of dollars extra cost—are *built into* Apple II. And it's designed to keep up with changing technology, to expand easily whenever you need it to.

As an educational tool, Apple II is a sound investment. You can program it to tutor your children in most any subject, such as spelling, history or math. But the biggest benefit—no matter *how* you use Apple II—is that you and your family increase your familiarity with the computer itself. The more you experiment with it, the more you discover about its potential.



Start by playing PONG. Then invent your own games using the input keyboard, game paddles and built-in speaker. As you experiment you'll acquire new programming skills which will open up new ways to use your Apple II. You'll learn to "paint" dazzling color displays using the unique color graphics commands in Apple BASIC, and write programs to create beautiful kaleidoscopic designs.

As you master Apple BASIC, you'll be able to organize, index and store data on household finances, income tax, recipes, and record collections. You can learn to chart your biorhythms, balance your checking account, even control your home environment. Apple II will go as far as your imagination can take it.

Best of all, Apple II is designed to grow with you. As your skill and experience with computing increase, you may want to add new Apple peripherals. For example, a refined, more sophisticated BASIC language is being developed for advanced scientific and mathematical applications.

And in addition to the built-in audio, video and game interfaces, there's room for eight plug-in options such as a prototyping board for experimenting with interfaces to other equipment; a serial board for connecting teletype, printer and other terminals; a parallel interface for communicating with a printer or another computer; an EPROM board for storing programs permanently; and a modem board communications interface. A floppy disk interface with software and complete operating systems will be available at the end of 1977. And there are many more options to come, because Apple II was designed from the beginning to accommodate increased power and capability as your requirements change.

If you'd like to see for yourself how easy it is to use and enjoy Apple II, visit your local dealer for a demonstration and a copy of our detailed brochure. Or write Apple Computer Inc., 20863 Stevens Creek Blvd., Cupertino, California 95014.

Apple II™ is a completely self-contained computer system with BASIC in ROM, color graphics, ASCII keyboard, lightweight, efficient switching power supply and molded case. It is supplied with BASIC in ROM, up to 48K bytes of RAM, and with cassette tape, video and game I/O interfaces built-in. Also included are two game paddles and a demonstration cassette.

SPECIFICATIONS

- **Microprocessor:** 6502 (1 MHz).
- **Video Display:** Memory mapped, 5 modes—all Software-selectable:
  - Text—40 characters/line, 24 lines upper case.
  - Color graphics—40h x 48v, 15 colors
  - High-resolution graphics—280h x 192v; black, white, violet, green (16K RAM minimum required)
  - Both graphics modes can be selected to include 4 lines of text at the bottom of the display area.
  - Completely transparent memory access. All color generation done digitally.
- **Memory:** up to 48K bytes on-board RAM (4K supplied)
  - Uses either 4K or new 16K dynamic memory chips
  - Up to 12K ROM (8K supplied)
- **Software**
  - Fast extended Integer BASIC in ROM with color graphics commands
  - Extensive monitor in ROM
- **I/O**
  - 1500 bps cassette interface
  - 8-slot motherboard
  - Apple game I/O connector
  - ASCII keyboard port
  - Speaker
  - Composite video output

Apple II is also available in board-only form for the do-it-yourself hobbyist. Has all of the features of the Apple II system, but does not include case, keyboard, power supply or game paddles. $598.

PONG is a trademark of Atari Inc.

*Apple II plugs into any standard TV using an inexpensive modulator (not supplied).

apple computer inc.™

A copy of the "1984" Superbowl advertisement for the MacIntosh can be found at https://youtu.be/2zfqw8nhUwA (1 min).

"Rip, mix, burn" Campaign (2001):

The original iPhone advertisements are available at https://youtu.be/z6PGRF0Wy_I (4 min).

VI. Competitive Products

Franklin Ace 1200 (1983)
(clone of Apple II)

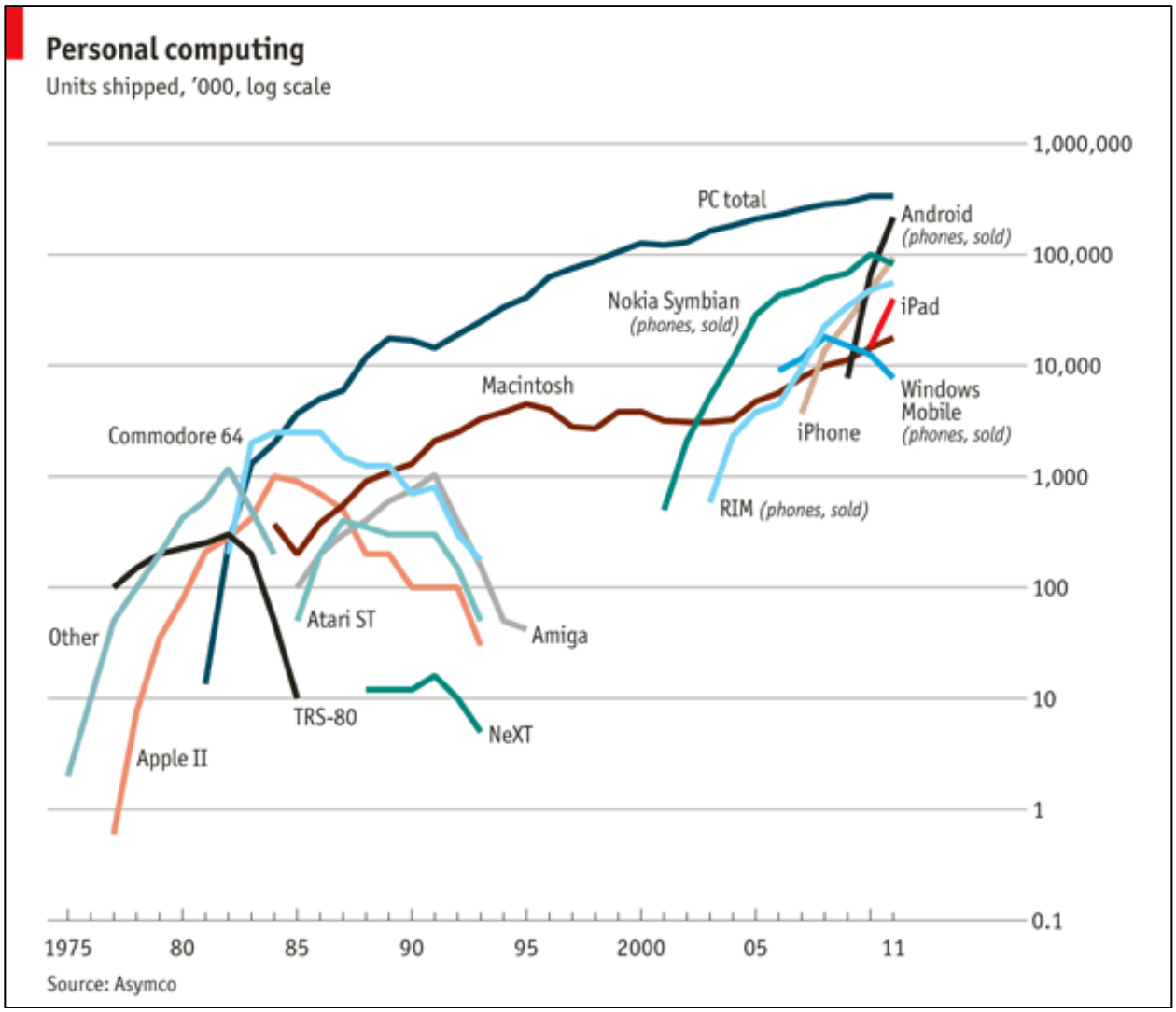
IBM PC (1981)

Samsung Original Galaxy (2009)

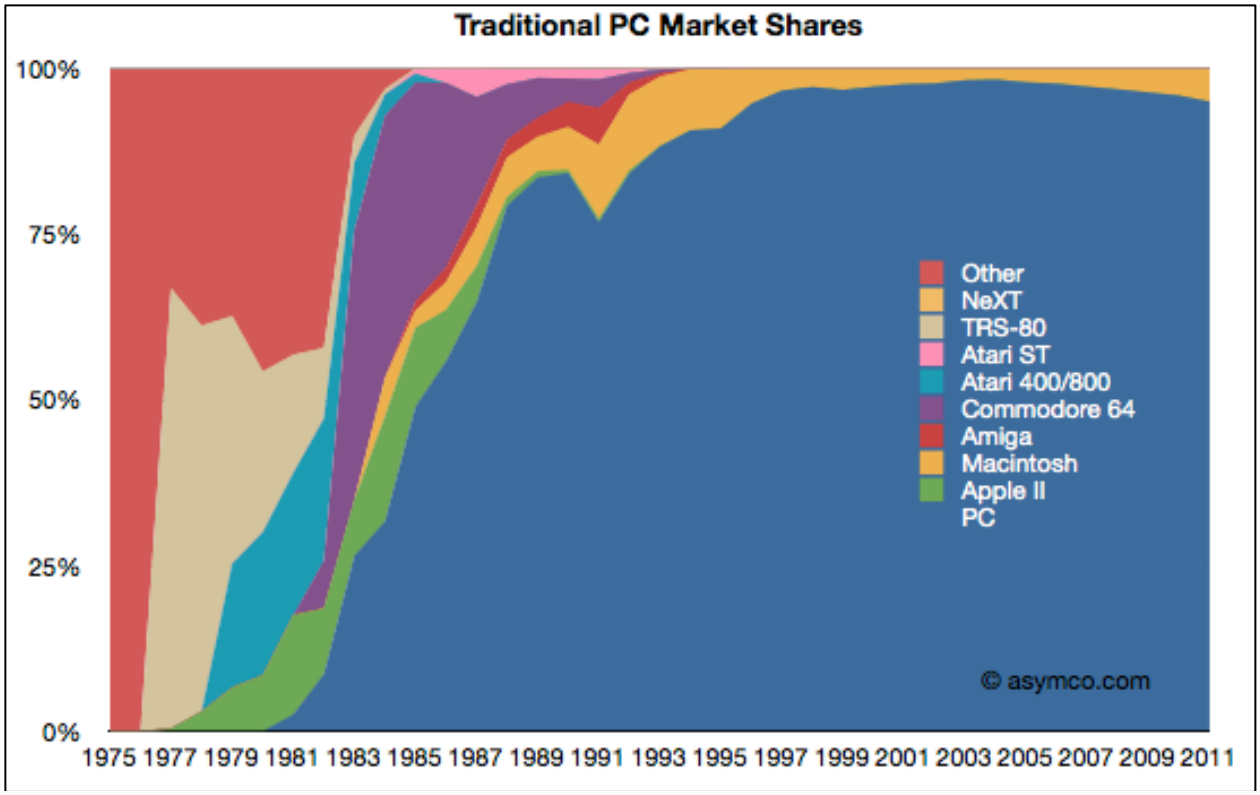
Galaxy S (March 2010)

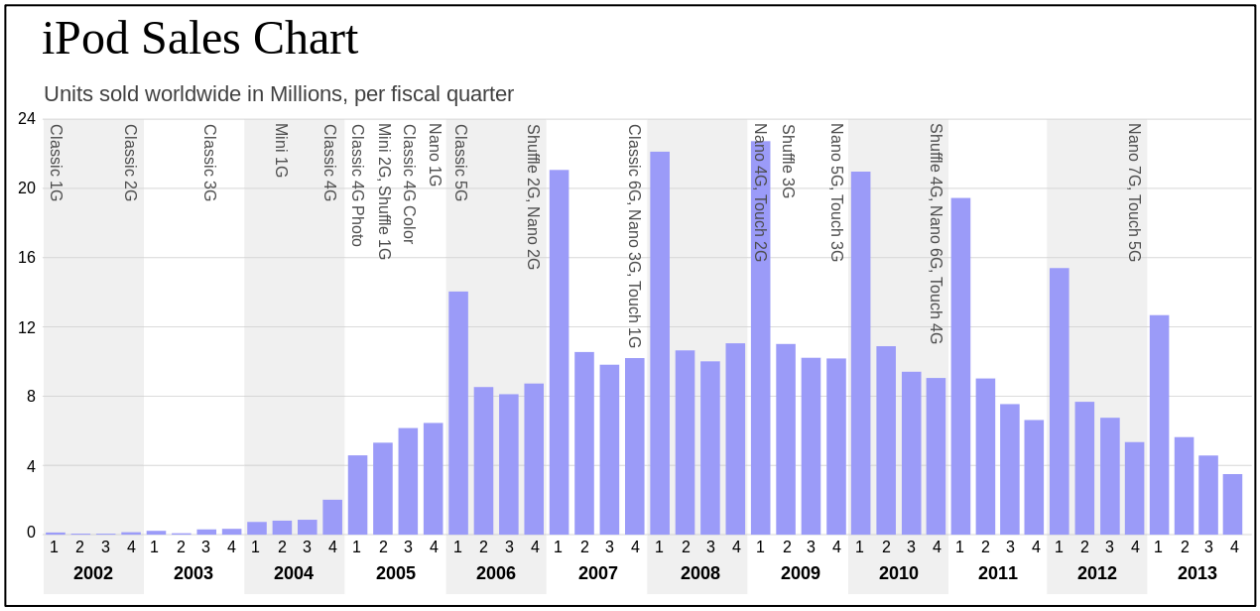
Galaxy S II

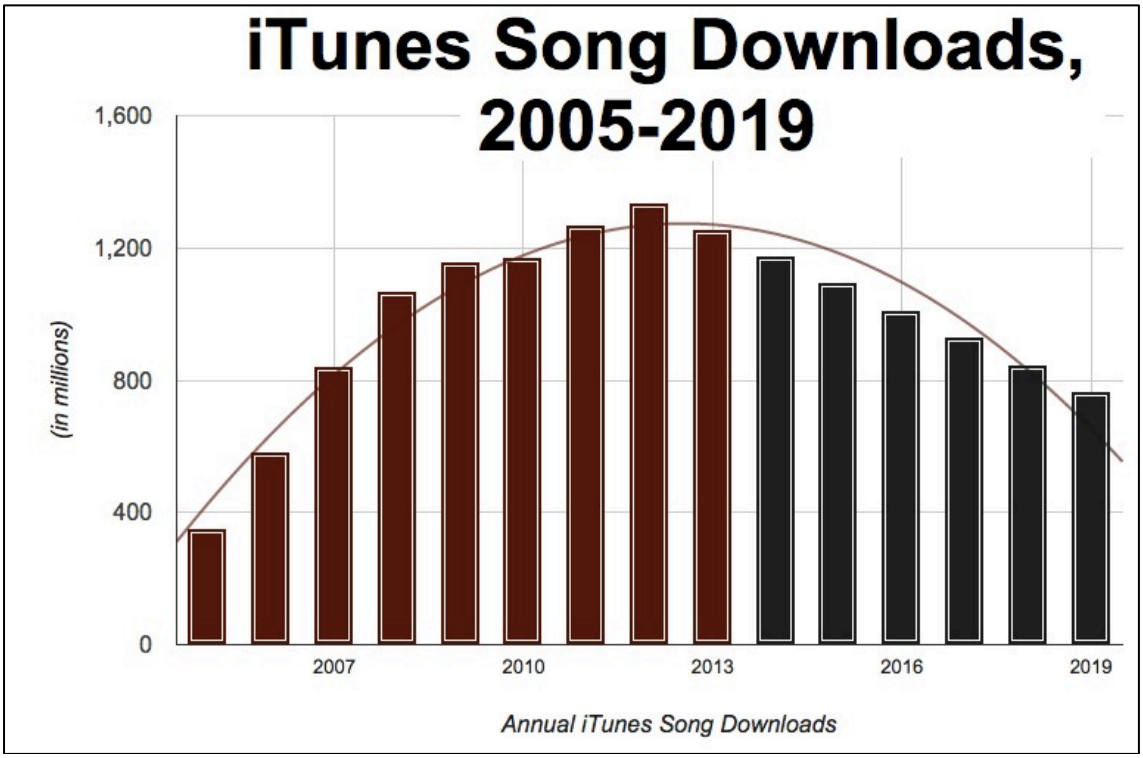
VII. Markets and Market Shares



Source: https://www.economist.com/blogs/graphicdetail/2012/02/daily-chart-13

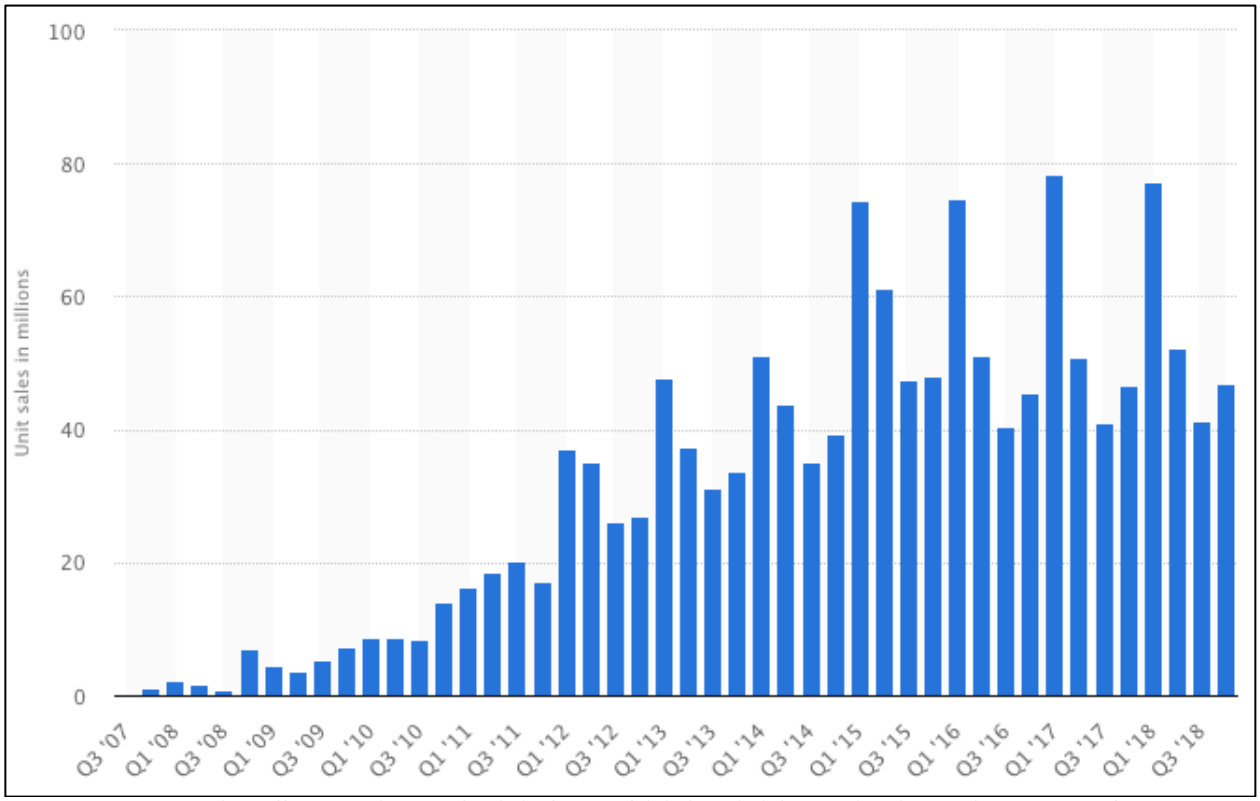

Traditional PC Market Shares
100%
75%
50%
25%
0%
1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011
Other
NeXT
TRS-80
Atari ST
Atari 400/800
Commodore 64
Amiga
Macintosh
Apple II
PC
© asymco.com


iPod Sales Chart
Units sold worldwide in Millions, per fiscal quarter
24
20
16
12
8
4
0
Classic 1G
Classic 2G
Classic 3G
Mini 1G
Classic 4G
Classic 4G Photo
Mini 2G, Shuffle 1G
Classic 4G Color
Nano 1G
Classic 5G
Shuffle 2G, Nano 2G
Classic 6G, Nano 3G, Touch 1G
Nano 4G, Touch 2G
Shuffle 3G
Nano 5G, Touch 3G
Shuffle 4G, Nano 6G, Touch 4G
Nano 7G, Touch 5G
1 2 3 4
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013



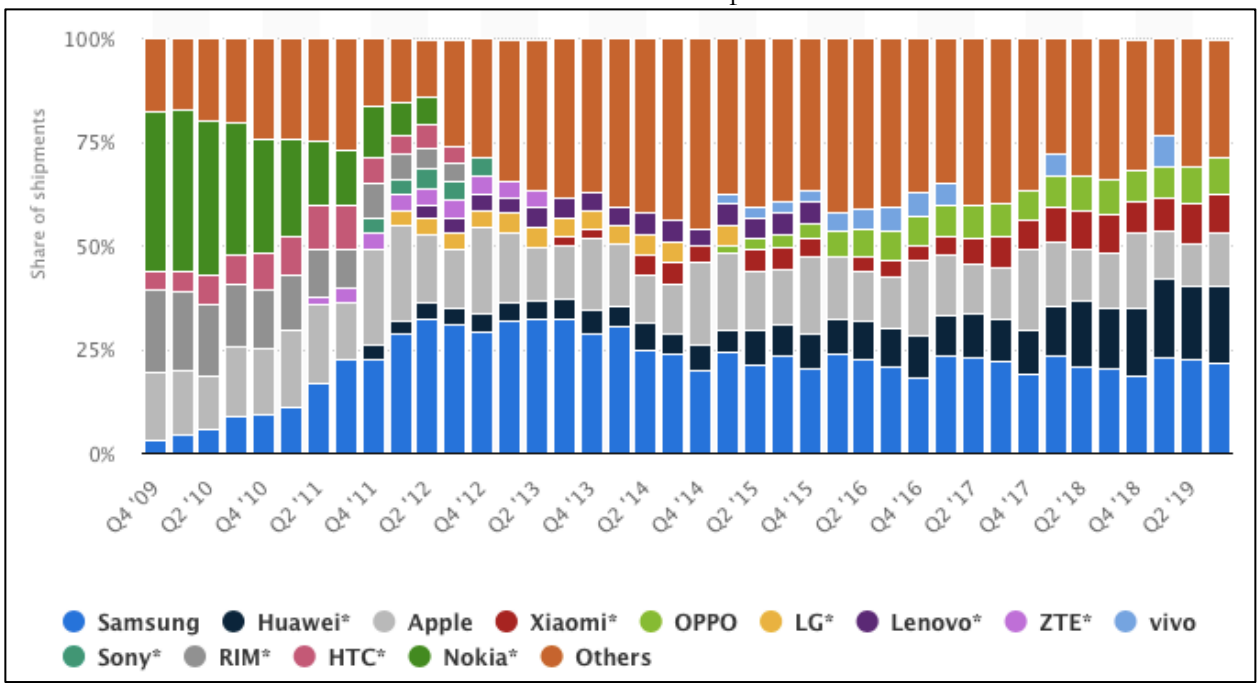
Source: https://www.digitalmusicnews.com/wp-content/uploads/2014/09/itunesstoredownloads-42019.jpg

Global iPhone Sales



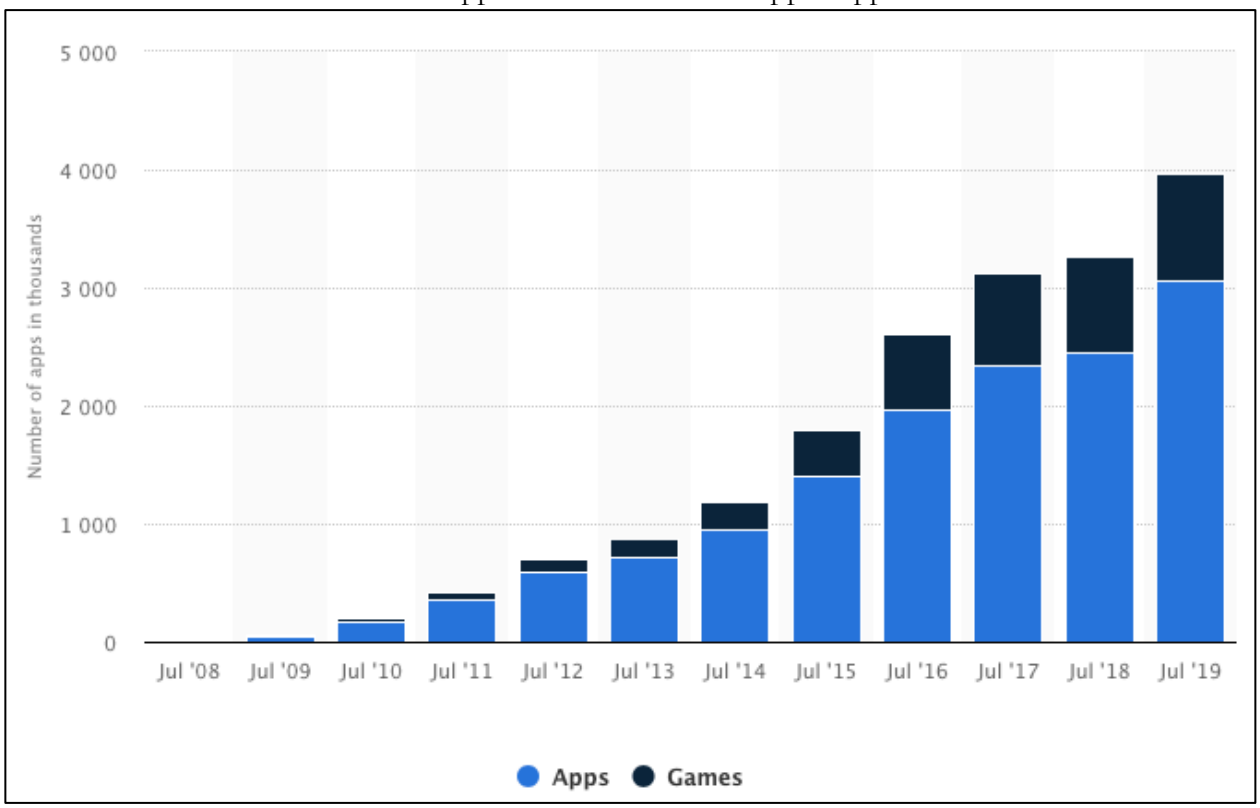
Source: https://www.statista.com/statistics/263401/global-apple-iphone-sales-since-3rd-quarter-2007/

Global Market Shares of Smartphone Makers



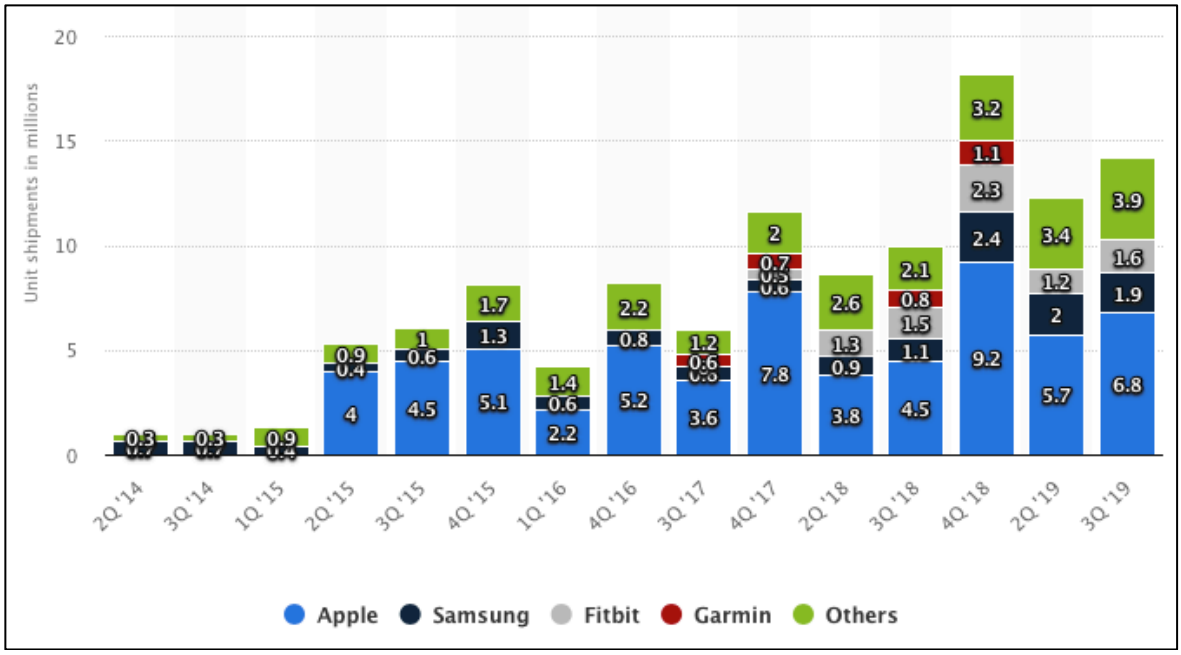
Source: https://www.statista.com/statistics/271496/global-market-share-held-by-smartphone-vendors-since-4th-quarter-2009/

Number of Applications available in Apple App Store



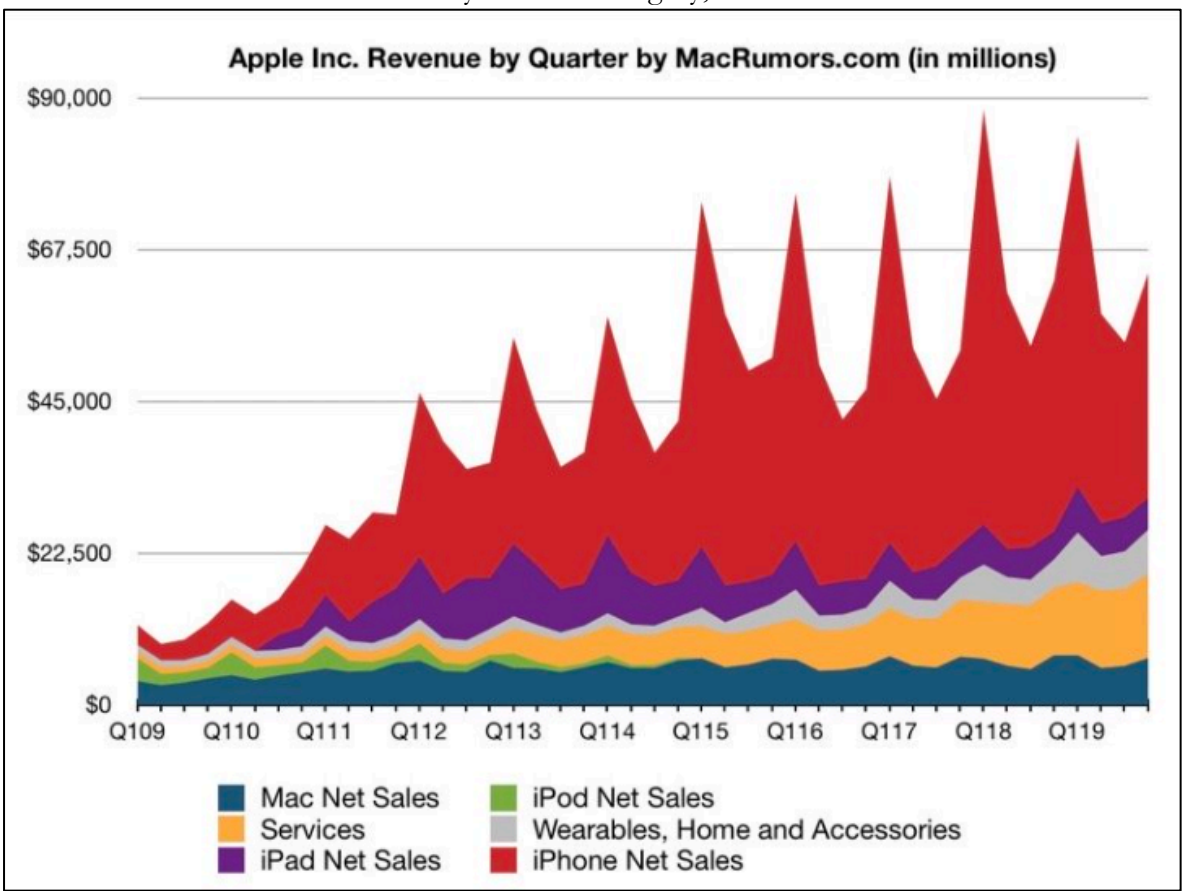
Source: https://www.statista.com/statistics/268251/number-of-apps-in-the-itunes-app-store-since-2008/

Global Smartwatch Sales, 2014-2019



Source: https://www.statista.com/statistics/524806/global-smartwatch-vendor-shipments/

Revenue by Product Category, 2009-2019



Source: https://www.macrumors.com/2019/10/30/apple-4q-2019-results/