



Comparing Microsoft PCs and Apple Computers

A widescreen format (16:9) test

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Use of terms

- **PCs:** computers using Microsoft Windows
- **Macs:** computers using Apple macOS
- Both PCs and Macs are personal computers

Just so you know...











Have not used Windows in five years

- ✓ Windows 7 last Microsoft OS used
- ✓ No knowledge of Windows 8 or 10

40+ Years Computer Experience

- Alpha Micro Systems (AMOS)
 - NCR Tower Unix
 - DEC Ultrix
 - Sun Solaris 11
 - DOS
 - Windows (2.1x, 3, NT, 95, 2000, XP, Vista, 7)
 - Apple OS (System 7, OS 8, OS 9, OS X, macOS)
- No emotional attachment to any operating system**

~~Massive Better~~—Macs Are Better

- Reasons PCs are better than Macs   **← Active link**
- Reasons Macs are better than PCs  
- Don't switch from Mac to PC 
- Advantages in switching from PC to Mac 
- The reasons why I switched to a Mac 
- Why I switched from Mac to Windows 
- Apple is dead, switching to Windows 
- Windows user—life is good with Apple 

No peace in sight...



A challenging presentation to prepare



Three Markets for Small Computers

- Consumer
 - ✓ Price
 - ✓ User interface (“the OS”)
 - ✓ Software availability
 - ✓ Support
 - ✓ Your first computer

Three Markets for Small Computers (cont.)

- Business

- ✓ Support—software and hardware
- ✓ Training
- ✓ Legacy systems—software and hardware
- ✓ Replacement = disruption = lower productivity = \$\$
- ✓ Total cost of ownership
- ✓ Return on investment (ROI)

Three Markets for Small Computers (cont.)

- Education¹ (K-12)

- ✓ Price
- ✓ Security
- ✓ Training (for faculty)
- ✓ Support

¹ Higher education more closely matches business

Business





Consumer

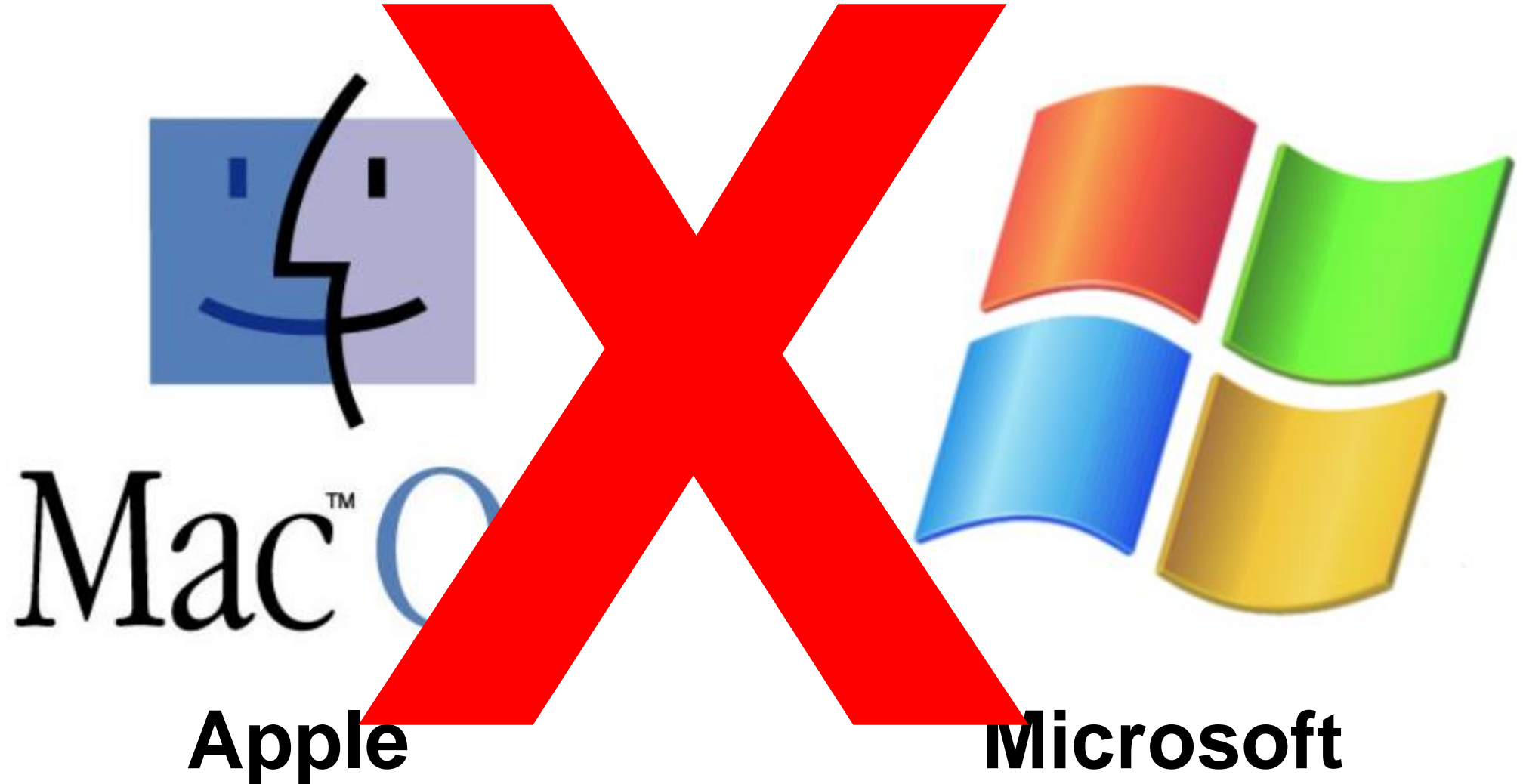


Focus

Laptop and Desktop Computers



Comparing macOS and Windows



Commonality—PCs and Macs

- Mature operating systems with good GUIs
- Solid backup software
- Microsoft Office (docx, pptx, xlsx)
- Adobe software (Photoshop, Lightroom, etc.)
- Common file formats (pdf, jpg, txt, etc.)

Commonality—PCs and Macs (cont.)



- Intel CPUs¹
- Common disk format [MS-DOS (Fat-32)]
- Common ports (USB & HDMI)
- Ethernet, Wi-Fi & Bluetooth
- Macs read Windows formatted CDs and DVDs
- Many peripherals (printers, scanners, digital cameras, etc.)

¹ Rumors—Apple to manufacturer their own ARM CPUs by 2020



Major Brands (2017)




Brand	Market Share (%)
HP	21.0
Lenovo	20.8
Dell	15.2
Apple	7.4
Asus	6.8
Acer	6.5
~50 Others	22.3

For more information see  

Operating Systems Market Share—May 2018

See  [URL](#)

**Under macOS lurks
Unix**

	Platform 	<input checked="" type="checkbox"/> Share 
<input type="checkbox"/>	Windows	88.67%
<input type="checkbox"/>	Mac OS	8.64%
<input type="checkbox"/>	Linux	2.25%
<input type="checkbox"/>	Chrome OS	0.31%
<input type="checkbox"/>	Unknown	0.12%
<input type="checkbox"/>	BSD (Unix)	0.01%

100.00%

Comparing Windows and Mac PCs

- “Which is best”—like a political or religious debate:
 - ✓ Facts
 - ✓ Disagreements over facts
 - ✓ Conflicting opinions
 - ✓ Uninformed opinions
 - ✓ Many disparate apple and orange comparisons¹
 - ✓ Emotional attachments

¹ Cumquat and prune comparisons?

A Genuine Microsoft fanboy?



Let's Talk Prices...



Making Price Comparisons

- Extremely difficult to make hardware comparisons
 - ✓ Incomparable hardware components
 - Storage: SSD vs. HD  
 - CPU: Intel i3 vs. i5 vs. i7 vs. i9—vs. AMD   
 - GPU: Nvidia vs. AMD vs. Asus vs. Intel  
 - RAM: DDR SDRAM, SRAM, DDR2, DDR3, DDR4 
 - ✓ Identical hardware with different OSs = different performance

Making Price Comparisons (cont.)

- Are Macs more expensive^a?
 - ✓ yes
 - ✓ no
 - ✓ it depends...

^a Apple does not compete in the low-end computer market

How Much Does a Middle-of-the-Road iMac Cost?

- Processor (CPU)
 - ✓ 3.0 GHz quad-core Core i5
 - ✓ 3.6 GHz quad-core Core i7
- Memory (RAM)
 - ✓ 8 GB 2400 MHz DDR4
 - ✓ 16 GB 2400 MHz DDR4



**21.5-inch iMac
Retina 4K Display**

21.5-inch iMac, Retina 4K Display (cont.)

- Storage
 - ✓ 1 TB HDD
 - ✓ 1 TB Fusion Drive
 - ✓ 256 GB SSD
 - ✓ 512 GB SSD
- Price \$1,300 → \$2,200



21.5-inch iMac
Retina 4K Display

19 Models of Apple Computers

Type	Number Models	Price Range
Mac Mini (headless)	3	\$500 → \$2,000
Laptops (MacBooks)	7	\$1,000 → \$4,200
Desktop (iMacs)	6	\$1,100 → \$5,400
Desktop (iMac Pro)	1	\$5,000 → \$13,300
Workstation (Mac Pro)	2	\$3,000 → \$7,000

For specific configurations and prices see 

Comparing an Dell XPS Special Edition with Apple 21-inch iMac



Dell XPS Special Edition  URL



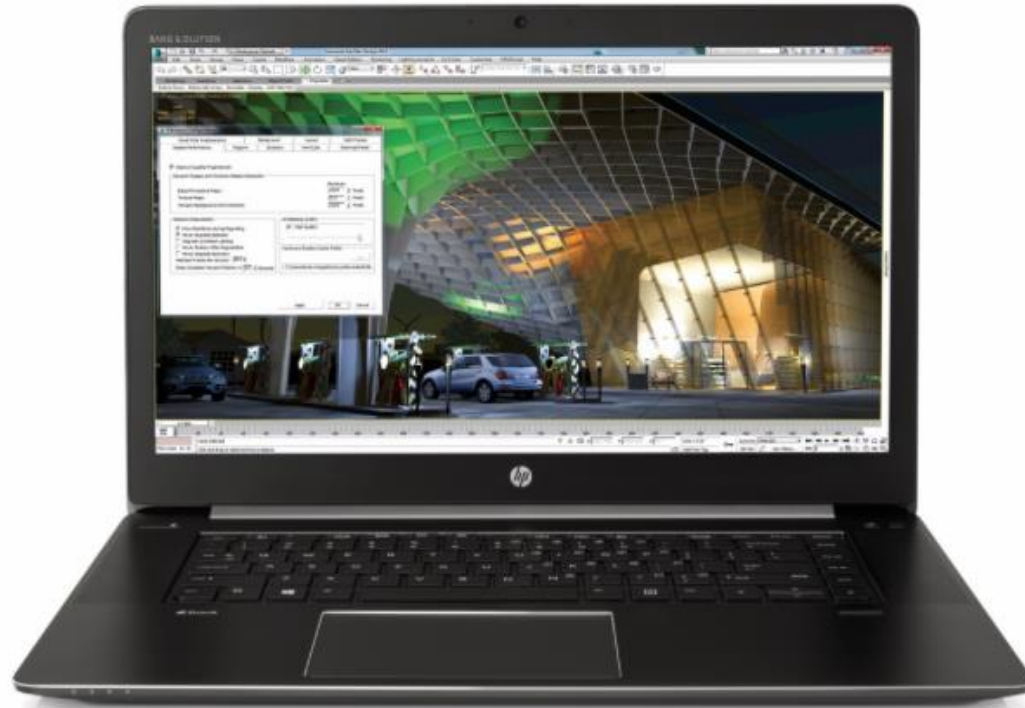
Apple 21.5-inch iMac  URL

Comparing an Dell XPS Special Edition with Apple 21-inch iMac

Component	Dell XPS Tower Special Edition	21.5-inch iMac
Operating System	Windows 10 Pro 64	macOS High Sierra
CPU	Intel i7-8700K, 6-Core	3.6 GHz i7,4-Core
GPU	NVIDIA GeForce GTX 1080 with 8 GB GDDR5X memory	Radeon Pro 560 with 4 GB memory
RAM	16 GB 2666 MHz, DDR4	16 GB 2400 MHz DDR4
SSD	512 GB PCIe x4 SSD	512 GB SSD
Wireless keyboard & mouse	KM714	Included
Speaker system	AE415	Included
Display	Dell 24 Gaming Monitor S2417DG, 2560 x 1440	Included, Retina 4K 4096 x 2304
Price	\$2,390	\$2,199

¹ The Dell computer is 8.7% more expensive.

Comparing an HP ZBook Laptop¹ with Apple 15-inch MacBook Pro



HP ZBook Studio G3 



Apple 15-inch MacBook Pro 

¹ Full name: HP ZBook Studio 15 G3 Mobile Workstation

Comparing an HP ZBook Studio 15 with Apple 15-inch MacBook Pro

Component	HP ZBook Studio 15 G3 Mobile Workstation	15-inch MacBook Pro
Operating System	Windows 10 Pro 64	macOS High Sierra
CPU	Intel i7-6820HQ with Intel HD graphics 530, 4-core	Intel i7 4-core
GPU	On CPU	Radeon Pro 555
RAM	16 GB DDR4-2133	16 GB DDR-4 2133 MHz
SSD	512 GB HP-Z Turbo Drive	512 GB
Display	15.6-inch, 1920 x 1080	15.4-inch 2880 x 1800
External Ports	1 RJ-45, 1 VGA, 4 USB-3, 2 Thunderbolt, 1 HDMI, 1 headphone	4 Thunderbolt
Weight	5.8 lbs.	4.02 lbs.
Price	\$2,336	\$2,599

¹ The Apple computer is 11.3% more expensive.

Comparing an HP All-in-One with Apple 21-inch iMac



HP EliteOne All-in-One  URL



Apple 21.5-inch iMac  URL

Comparing an HP All-in-One with Apple 21-inch iMac

Component	HP All-in-One	Apple 21-inch iMac
Operating System	Windows 10 Pro 64	macOS High Sierra
→ CPU	Intel 3.2 GHz quad-core 7th-generation Intel Core i5 processor, Turbo Boost up to 3.6 GHz	Intel 2.3 GHz dual-core 7th-generation Intel Core i5 processor, Turbo Boost up to 3.6 GHz
→ GPU	No dedicated GPU. HD Graphics 530 on CPU	Intel Iris Plus Graphics 640
→ RAM	16 GB DDR4-2400 SODIMM	16 GB DDR4-2133 MHz
→ SSD	256 GB	256 GB
→ Display	23.8-inch (1920 x 1080)	21.5-inch (1920 x 1080)
Price	\$1,447 ^a	\$1,499 ^b

^a On sale from \$2,334 (April 9, 2018)

^b The Apple computer is 3.6% more expensive.

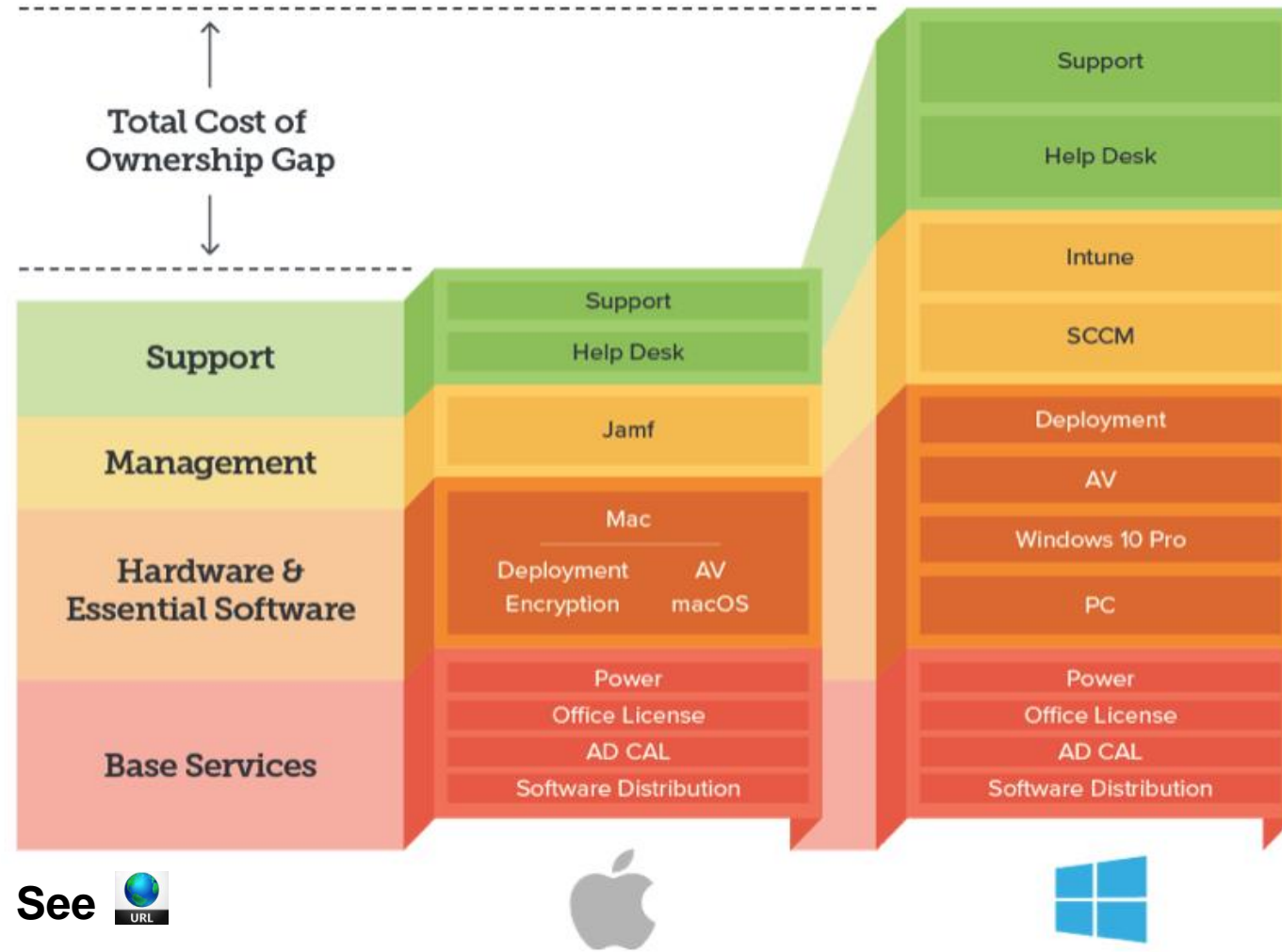
Making Price Comparisons (cont.)

- So, are Macs more expensive?^a
- My opinion: for the *initial purchase*—Macs are ~10% more expensive than for *comparable* PCs^b

^a **Apple does not compete in the low-end computer market**

^b A problematic estimate

Mac vs. PC in the Enterprise



IBM Adopting Mac Computers

MAC VS PC TCO

See



Comparison of 4-Year Total Cost of Ownership of Apple Mac vs Windows PC



MacBook Pro 13



MacBook Air 13



MacBook Pro 13



Lenovo T460









Lenovo T460



Lenovo X1 Yoga

Savings over a 4-year period per computer

IBM Adopting Mac Computers (cont.)











- IBM deploying 1,300 Macs per week (2016)  
 - ✓ 73% of employees want Mac as next corporate computer
 - ✓ IBM-Japan requires justification for other than Mac
- PCs three times as to expensive to maintain  
- Other adopters (as of Jan 2018)  
 - ✓ CapitalOne 12,000 Macs
 - ✓ SAP 13,000 Macs
 - ✓ Walmart?

Microsoft's Business Model

Revenues as Reported

Microsoft Corp., Income Statement, Revenues

USD \$ in millions

	12 months ended	Jun 30, 2017
→  Microsoft Office system	25,389	28.2%
→  Server products and tools	21,758	24.2%
 Xbox	9,256	
→  Windows PC operating system	8,625	9.6%
 Advertising	6,971	
 Consulting and product support services	5,588	
 Devices	4,557	
 LinkedIn	2,268	
 Other	5,538	
 Revenue from external customers	89,950	

Source: Microsoft Corp. Annual Reports

For more information about Microsoft's products and tools see 

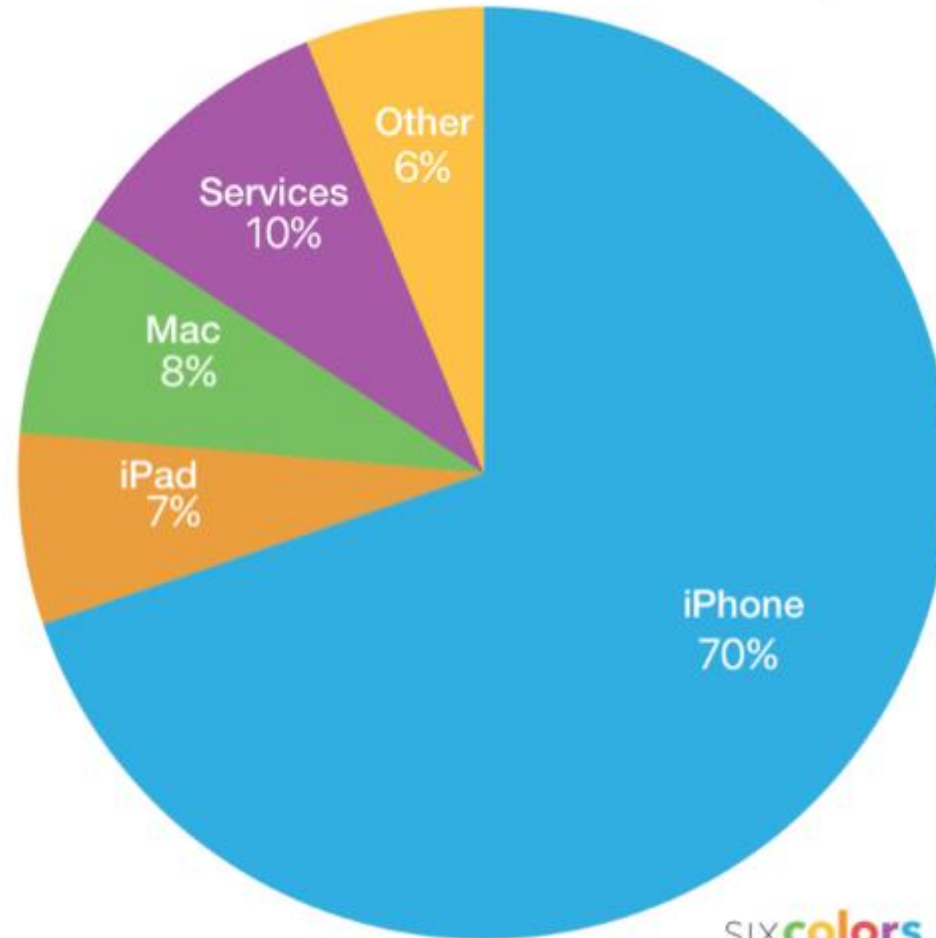
Satya Nadella (Microsoft CEO) makes reference to "Microsoft 365" 

Apple's Business Model

In the 1st quarter 2018 Apple sold 5 million Mac computers for \$6.9 billion in revenue 

The other “Mac”, McDonald's restaurants averages (2017) quarterly revenues of \$5.7 billion 

Apple Q1 2018 revenue by category



Source: Apple financial statements. February 1, 2018.

For more information from Apple see 



Paraphrasing Philip W. Schiller (Apple)

- The job of the [Apple] Watch is to do more and more things on your wrist so that you don't need to pick up your iPhone so often.
- The job of the iPhone is to do more and more things so that you don't need your iPad.

Paraphrasing Philip W. Schiller (cont.)

- The iPad should be to be so powerful and capable that you may never need a MacBook.
- The job of the MacBook is to make it so you never need an iMac.

For more details, see  [URL](#)

What matters to us?



Scale of 1-5
5 = best

My wants →



? →



Feature	Mac	PC	Comments
Boot Time	5	3	Dependent of boot device
Build Quality	5	3	
Customer Service	5	1	Sales and after sales
Customization	3	5	At time of purchase
Drivers	5	3	
Gaming	2	5	
Operating System	5	4	Most consumers unaware
Performance	3	3	Hardware dependent
Price	3	5	
Repair Costs	3	5	
Security	4	2	Anti-malware software essential for PCs
Software Availability	4	5	Not an issue for most consumers
Touch Capability	—	3	Unavailable for macOS
Hardware upgrades	1	4	
User Interface	5	4	Quite subjective
User Maintenance	4	2	
Total			




Advantages—PCs

- Many choices of hardware
- Highly customizable systems
- Relatively easy to upgrade hardware components
- Wide range of prices and quality
- Many third party repair businesses

Advantages—PCs (cont.)

- Many more games available
- Good documentation from Microsoft
- Many books and magazines

Disadvantages—PCs

- Poor after-sales support for consumer market
- Windows OS not optimized for specific hardware
- Software updates from multiple sources
- Microsoft Windows may become a rental product for consumers 

Advantages—Macs

- Operating system optimized to hardware
- Excellent after-sales support
- No bloatware or trial software
- Uninstalling software is simple—drag/drop to trash
- Software updates relatively easy to install
- Included software: Pages, Keynote & Numbers (iWork) & Keychain password manager

Advantages—Macs (cont.)

- Macs integrate very well with iPhone and iPad (“Apple ecosystem”)
- Windows can run on a Mac (Boot Camp, Parallels Desktop or VirtualBox)
- Antimalware software unnecessary¹ (?????)

¹ Run free version of Malwarebytes weekly on iMacs and MacBook Pro

Disadvantages—Macs

- Macs' hardware not DIY upgradable
- Somewhat higher initial purchase price
- Difficult to find apps on Apple App Store
- Smaller user community than Windows

Moving from ~~Mac to PC~~ ~~PC to Mac~~



What could possibly go wrong?



Nigel, I thought you closed the cage door!



The first day...

Why doesn't this work?

What happened?

I can't find anything

~~Scatological word!~~



Whimper

Groan

Moan



Snivel

Whine

Grumble

After a week?
...could be worse



After two weeks?

...pretty good



After a 2-3 months?

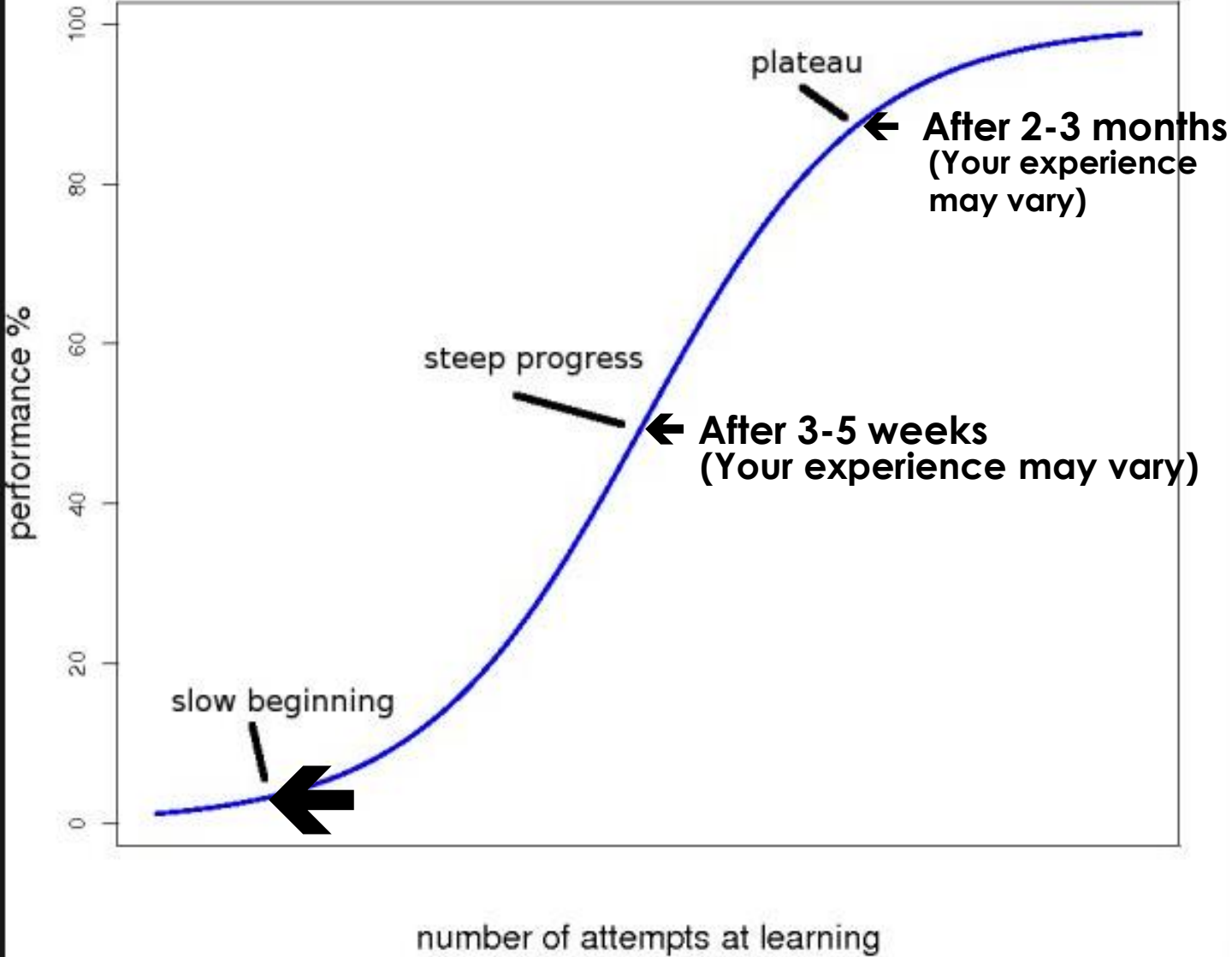
...all is well...

...almost...

...sort of...



Going from Windows-PC to Apple Computer



My Experience: Windows → Mac

- In getting to a comfortable working level...
 - ✓ Transfer of Microsoft Outlook data to corresponding Mac apps was painful
 - ✓ Learning the new Mac applications took some effort—data cleanup required
 - ✓ Microsoft Office from PC to Mac was seamless (Office 365—Word, PowerPoint & Excel)
 - ✓ Most Mac apps easy to learn—especially backup
- Lack of Apple documentation was annoying

Five Years Experience with Macs^a

- No hardware failures
- Total of 3-6 system crashes^b
- AppleCare support:
 - ✓ Total 4-6 calls
 - ✓ Excellent service

^a Two iMacs (21.5-inch) and one MacBook Pro (13-inch)

^b Equivalent to Windows “Blue Screen of Death”

Five Years Experience with Macs (cont.)

- Five major OS updates; 30-40 minutes each^{a,b}
- Applications updated through App Store
- 2-4 other apps updated from other sites
- Office 365; 4-8 updates/year from Microsoft
- Overall 70-80% reduction in computer maintenance effort

^a One to three minor updates/year ^b macOS Mojave coming this fall

Five Years Experience with Macs (cont.)







- No one has stopped speaking to me
 - not even our son
- Changing from PC to Mac has been good decision for our family
- Downside—loss of Windows skills
- Downside—some degree of detachment from Microsoft community and PATACS/OPCUG



Would I Ever Go Back to PCs?

Certainly, if the pain would be worth the gain

Additional Resources

- Microsoft vs. Apple 
- Windows vs. Linux vs. Mac 
- Windows 10 Alternatives and Competitors 
- Mac vs. Windows Myth Busting 
- Is the Surface Book 2 a MacBook Pro Killer? 
- macOS Sierra vs. Windows 10 
- Mac vs. PC 