

# Apple iPod Technology Roadmap



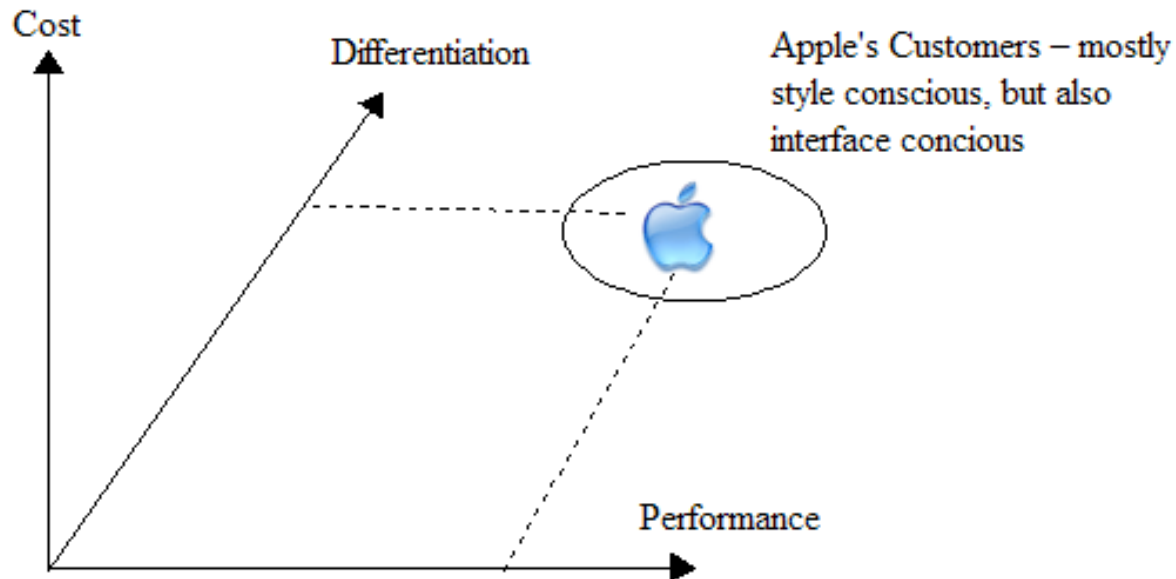
Gautam Banerjee  
University of Southern California  
Los Angeles, California 90089-0626 USA



Gautam Banerjee, 2006  
gbanerje@usc.edu

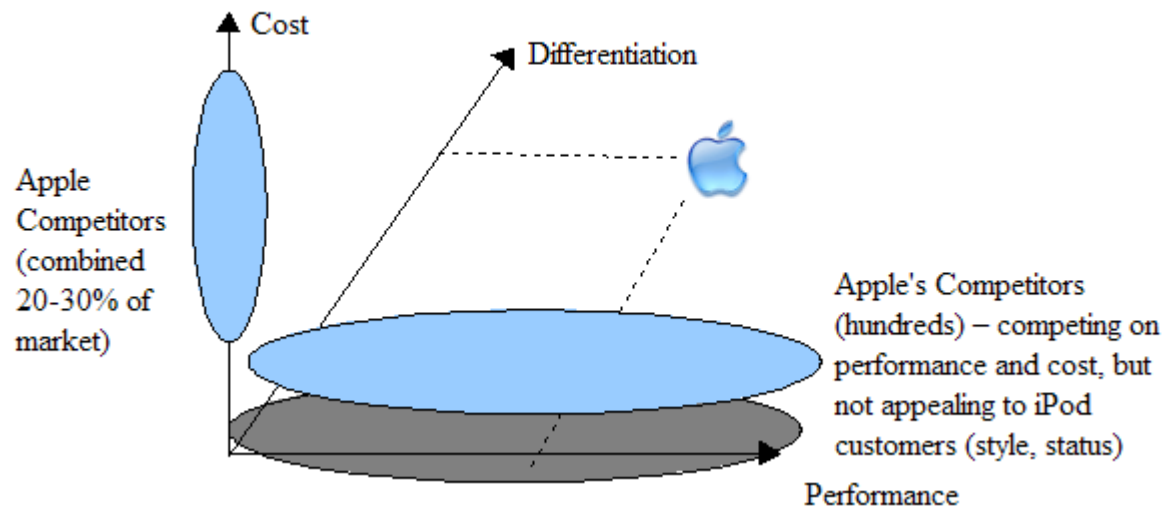
Daniel J. Epstein  
Department of Industrial & Systems Engineering

# How does the iPod Compete?



- Competes on performance, but mostly differentiation - Look/Touch/Feel – User experience (includes iTunes)
- Apple serves customers well – they care about the look and great user experience
- Not just easy to use, but also a status symbol (key reason for success)

# Where are Apple's Competitors?



- Competitors competing on performance and cost, but can't break "threshold of differentiation": can't match interface ("look/touch/feel"), no iTunes compliment
- Difficult to become status symbol



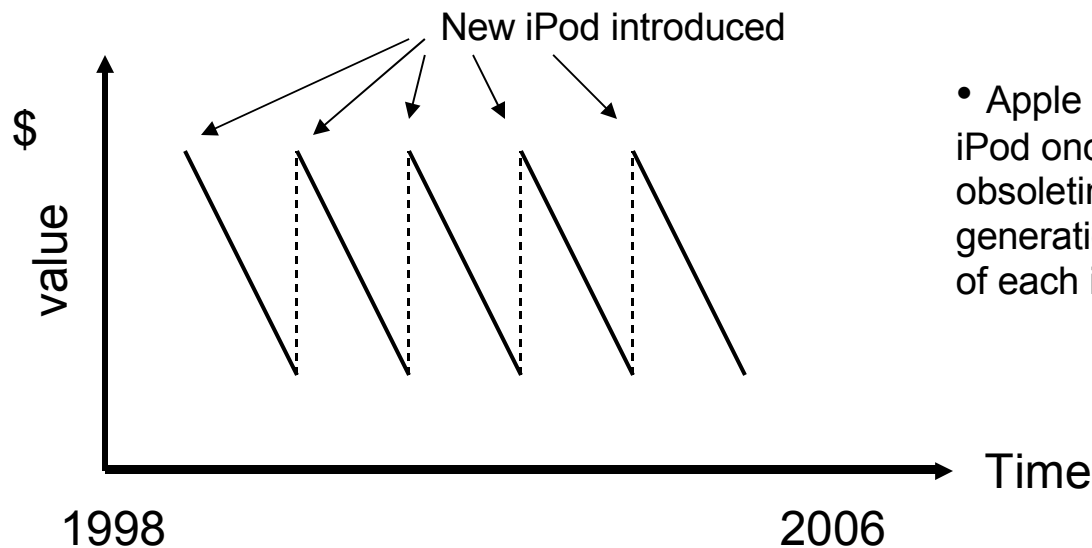
# iPod Technology Framework



<b>Base</b>	Mini hard drives and/or high density flash memory, Audio processing
<b>Key</b>	“Cool” design, compact form factor, simple, intuitive user interface, iTunes
<b>Pacing</b>	OLED touch & wide screen capability, wireless Internet, bluetooth (wireless ear phones), longer, more efficient power supplies
<b>Emerging</b>	FOLED, and Virtual Retina Display, Nanotechnology Batteries and Memory



# iPod Economic Life – The “Intel” Approach

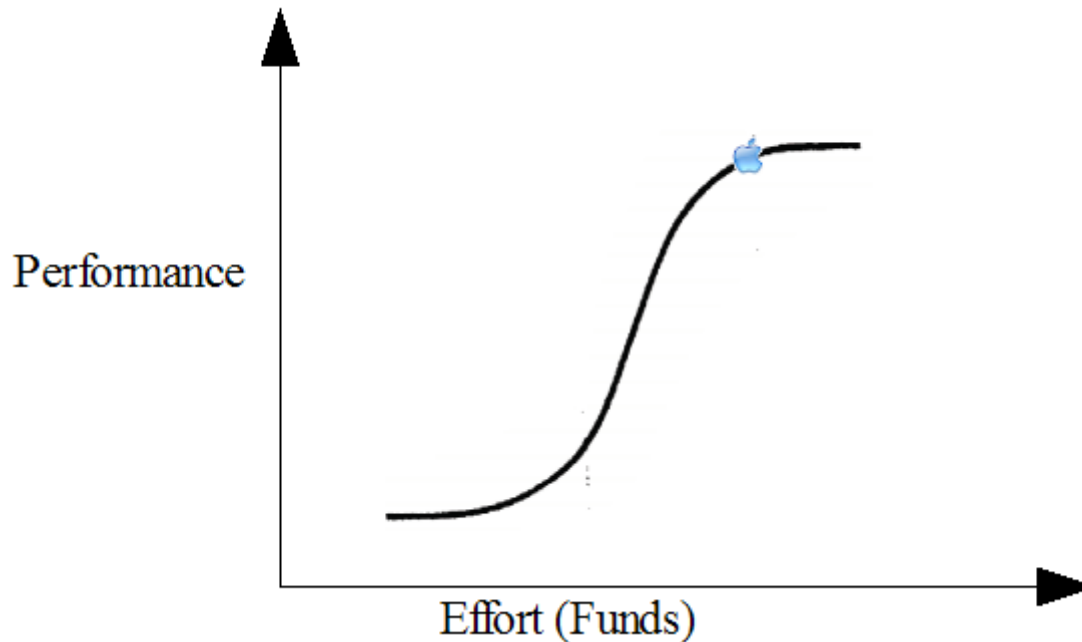


- Apple purposely redesigns the iPod once a year, effectively obsoleting the previous generation, making economic life of each iPod short – why?

- Intel Approach – quick development times with small incremental improvements = competitive barrier + kills the market for used iPods; lets Apple control the so-called state-of-the-art on their terms, not their competitor’s terms

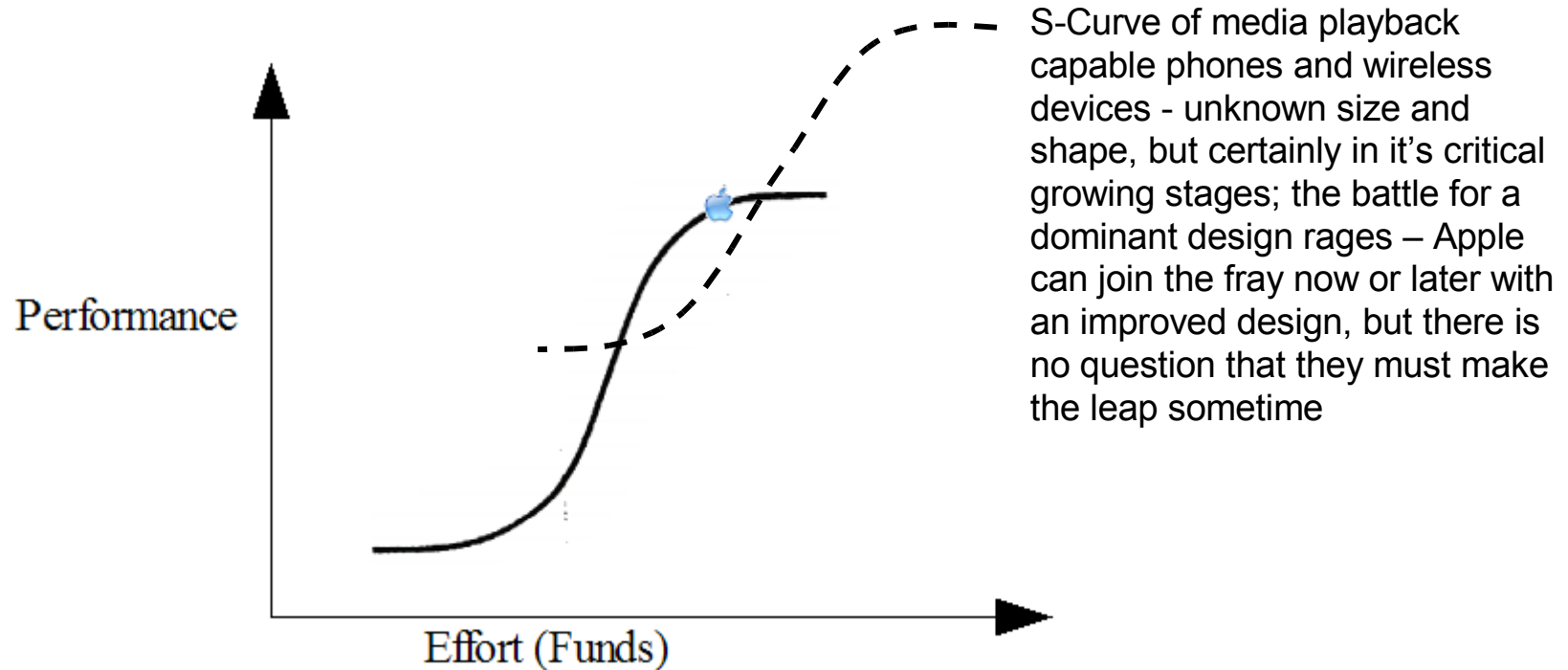
- Keeps artificial air of novelty – key for status-symbol mystique, “keeping up with the Joneses” factor for consumers

# The iPod S-Curve – the iPod is maturing



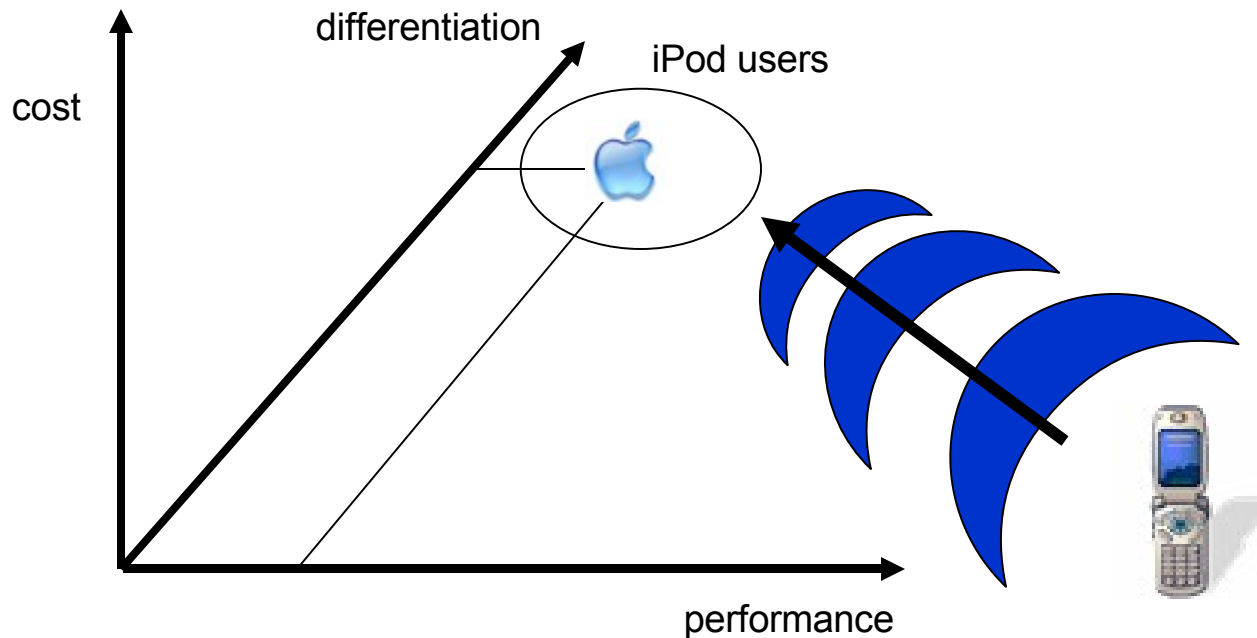
- How do we know? – Convergence! Media playback now being integrated in all sorts of portable electronics (game consoles, phones, UMPCs, PDAs, etc)
- Convergence is key indicator of maturity (think digital cameras – when they matured, firms put cameras on cell phones. Why? To get more value out of them. Same thing happening here)

# What Apple Must Do



- What does this mean for Apple? ASP of iPods will decrease, ROI diminishes
- What can Apple do to remedy this? They must play in a new space - a newer S-Curve - that of portable wireless devices with media playback

# Threat of Convergence



- As capacity sizes grow, feature rich, higher performing phones with media playback will eventually encroach on Apple's competitive space *and* start appealing to iPod's customers unless Apple extends its competitive posture (makes the leap to wireless communications)

# Recommended Market & Technology Strategy



		Market			Risk ↓
		DEFEND	EXTEND	NEW	
Technology	Evolutionary	50			↓
	Competitor		40		
	Innovation	10			

Risk →

- 50% of resources on defending market share with iPod enhancements (keep Intel approach), relatively low risk, quicker development times
- 40% of resources to extend Apple into wireless market segments, medium risk
- 10% monitoring innovative, potentially disruptive technology for possible iPod integration; risky, high upside potential



# 5-Year Technology Roadmap



<i>R&amp;D Selection</i>	2006	2007	2008	2009	2010
Subscription Based iTunes	[Blue bar]				
Web 2.0 iTunes		[Blue bar]			
Song Recognition		[Blue bar]			
OLED Touchscreen	[Blue bar]				
Direct Methanol Fuel Cells			[Blue bar]		
Wireless Internet, Integrated iTunes, OTA Downloads	[Red bar]				
Fractal Antenna		[Red bar]			
FOLED Screens			[Red bar]		
Nano-batteries and nano-memory				[Green bar]	
Virtual Retinal Displays				[Green bar]	

-  Market Defense – Integrating External Mature Technologies, low risk
-  Extend to Adjacent Markets - Integrating Mature External Technology (low-medium risk)
-  Market Defense – Integrating innovative, at present immature technologies (higher risk)



## 50% - Enhancing the iPod with External Technology (Market Share Defence)



<i>R&amp;D Selection</i>	2006	2007	2008	2009	2010
Subscription Based iTunes	■				
Web 2.0 iTunes		■			
Song Recognition		■			
OLED Touchscreen	■				
Direct Methanol Fuel Cells			■		



- Key for market defence is more user involvement: iTunes subscription option, Web 2.0 practices [social networking in iTunes]
- Coolness factor – Organic LED wide touchscreens (lower power than LCD too)
- Better battery technology – right now, iPod batteries are inferior to phones (can't swap out on the fly, can't replace without sending iPod back to Apple with expensive replacement fee);
- Fuel Cells offer promise of quick recharges (seconds)

## 40% - Extend to Adjacent Market Segments with External Mature Technologies



<i>R&amp;D Selection</i>	2006	2007	2008	2009	2010
Wireless Internet, Integrated iTunes, OTA Downloads	████████████████████				
Fractal Antenna		████████████████			
FOLED Screens			████████████████		



- Folding OLED screens – better viewing experience – also potential for eBooks and print media on iPods
- Go Wireless – OTA downloads, phone calls, internet surfing and iPod-iPod communication and sharing
- Fractal Antennas – to keep form factor compact

# 10% - Market Defence with Innovative Technology



<i>R&amp;D Selection</i>	2006	2007	2008	2009	2010
Nano-batteries and nano-memory				██████████	██████████
Virtual Retinal Displays				██████████	██████████

- Virtual Retinal Displays – Laser projection on retina or surface (wide screen viewing)
- Ultra high capacity memory and battery nano technology
- Apple is not a cultivator of technology anymore, but excels at technology adaptation – recommendation here is to monitor outside technology for possible iPod integration





## Additional Questions/Comments

Contact:

Gautam Banerjee

[gbanerje@usc.edu](mailto:gbanerje@usc.edu)

818-519-6361



Gautam Banerjee, 2006  
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**Daniel J. Epstein**  
Department of Industrial & Systems Engineering