Innovation Capability and the Maturity Model

with a case studies of Apple Computer, Inc. and iPod

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Think Different

Overview

- Literature Review
- The Framework : 4 Different Contexts
- the Maturity Model : extending the framework
- Case Studies : Apple Computer & iPod
- Conclusion & Recommendations : applying the Maturity Model

Literature Review

J. Barney	J. Christensen	J. Guan and N. Ma	B. Lawson and D. Samson
Asset sustaining competitive advantage must be: 1. Valuable 2. Rare 3. Imperfectly Imitable 4. Difficult to Substitute	Four Innovation Assets: 1. Scientific Research 2. Process Innovation 3. Product Innovation 4. Aesthetic Design	7 Dimensions: 1. Learning Capability 2. R&D Capability 3. Resource Allocation Capability 4. Manufacturing Capability 5. Marketing Capability 6. Organization Capability 7. Strategic Planning Capability	7 Core Elements: 1. Vision and Strategy 2. Harnessing the competence base 3. Organization intelligence 4. Creativity and Idea Management 5. Organizational Structures and Systems 6. Culture and Climate 7. Management of Technology

Literature Review

- Sen & Egelhoff : relationship between innovation capabilities and the use of technical alliance
- Christensen : creating new disruptive growth business requires the ability to create new market and disrupting the business model from low end
- Parhalad & Ramaswamy : ability to shift focus away from products and services onto experience environment to create unique value

the Framework Explained

4 Different Contexts	
1. Strategy a. Vision b. Technical Alliance c. Merger & Acquisition d. Technology Adoption 2. Organization Aspects a. Resource Allocation & Planning b. People (Champions) c. Intangible Resources and Assets d. Financial Performance e. Culture	3. Management a. Knowledge and Learning b. Customer Relationship c. Supplier and Distributor Relationship 4. Business Functions a. R&D b. Marketing c. Manufacturing

the Framework (1. Strategy)

- Vision
  - objectives and targets want to achieve
  - offensive strategy for trying to create future
  - requires comprehensive planning to achieve the vision

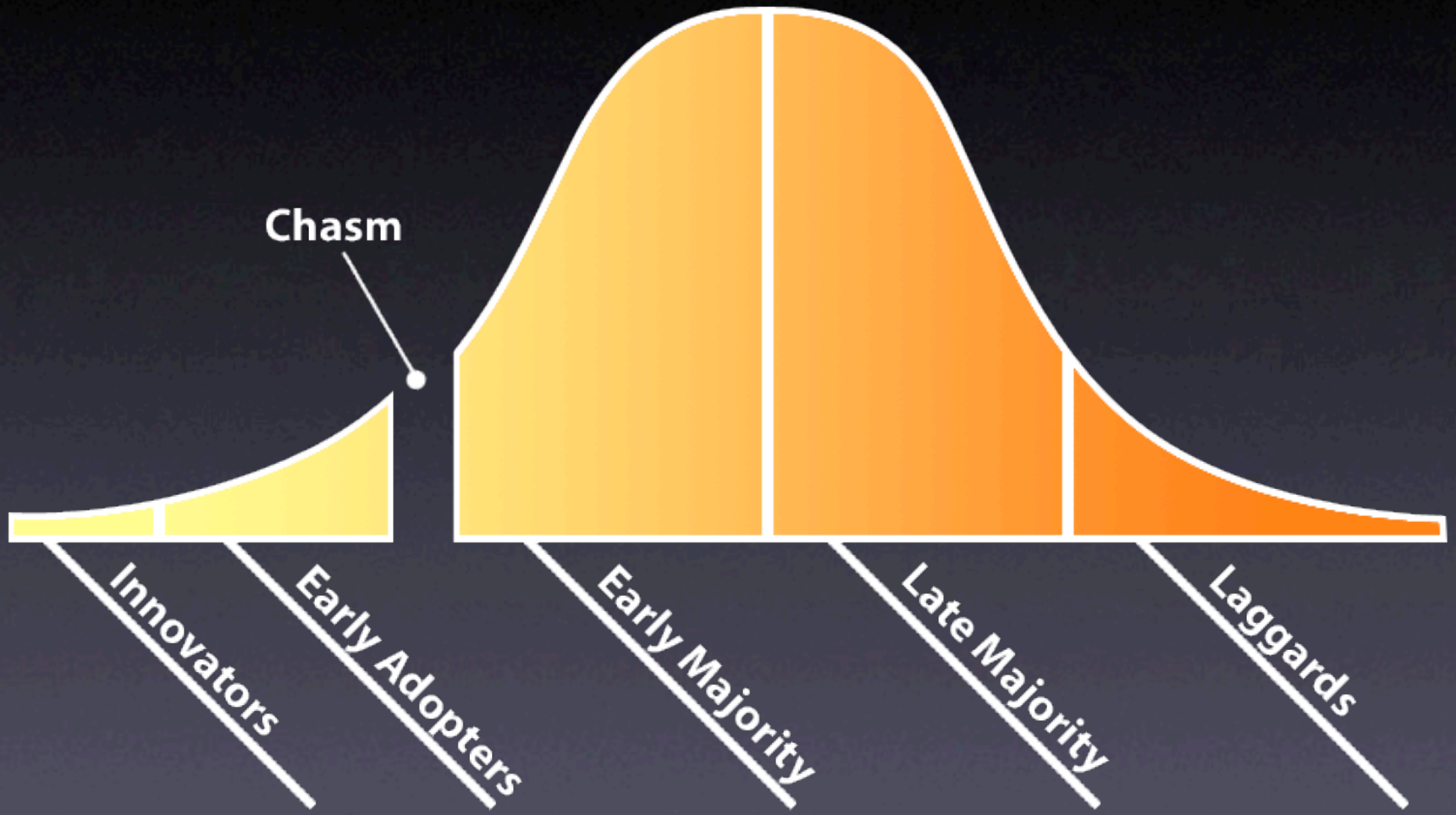
the Framework (1. Strategy)

- Technical Alliance
  - acquire product innovation to supplement existing innovation capability
  - one-to-one partnership: leverage core competence to each other
  - multiple parties: leader and followers
  - open group: collaborating for new technology development

the Framework (1. Strategy)

- Merger and Acquisition
  - the rate and size of M&A
  - right targets for supplement competence
- Technology Adoption
  - mapping product mix to Technology Adoption Life Cycle
  - high innovation capability => more products in Innovators, Early Adopters and Early Majority

Technology Adoption Life Cycle



the Framework
(2. Organization Aspects)

- Resource Allocation and Planning
  - able to effectively assign, balance, combine and direct resources to the required functions
  - proper planning & appropriate allocation => no bias

the Framework
(2. Organization Aspects)

- People (Champions)
  - requires different key individuals at different stages
  - gatekeepers, product champions and project sponsors
  - top management support => driving force & elevates motivation

the Framework
(2. Organization Aspects)

- Intangible Resource & Assets
  - innovation & manufacturing process
  - quality control
  - bargaining power to suppliers and distributors
  - => hard to imitate & deeply rooted

the Framework
(2. Organization Aspects)

- Financial Performance
  - net sales, sales growth & gross margin
  - comparing mainstream & innovation products
- Culture
  - failure friendly, failure = milestone for success
  - mutual respect
  - encourage open innovation culture

the Framework (3. Management)

- Knowledge & Learning
  - easily circulated and accessible
  - ability to process, interpret & manipulate
  - feed back intelligence into innovation process
    => remove uncertainty & unknown
  - systematically monitor trends
  - learning from competitors
  - learning from success & failure

the Framework (3. Management)

- Customer Relationship
  - discover customer problems & needs
  - reliability & quality of customer information
  - CRM => accurate, correct insight to problems
- Supplier & Distributor Relationship
  - external parties => hard to control
  - important to achieve better time-to-market
  - bargaining power

the Framework
(4. Business Functions)

- R&D
  - multidisciplinary character
  - balance between technological and marketing skills
  - detailed planning and excellent execution
  - high R&D spending preferred
  - measuring innovation output & no. of patents issued

the Framework
(4. Business Functions)

- Marketing
  - right timing of product introduction
  - balance between technology push & market pull
  - pricing, promotion, branding
    - slight influence
    - marketing as front-end to gather information to different business units

the Framework
(4. Business Functions)

- Manufacturing
  - ability to produce products based on design spec.
  - in reasonable timeframe
  - process quality

the Maturity Model

- Idea : Capability Maturity Model from SEI
- 5 Maturity Levels
  - evolutionary plateau
  - achieving a mature software process
  - continuous process improvement

the Maturity Model

Capability Maturity Model

Maturity Model for Innovation Capability

the Maturity Model

1. Discrete

The organization has no formal innovation process. The innovation product is developed by chances or in ad-hoc manner. There is no concrete planning for resource allocation for implementing and generating innovations.

2. Established

The innovation process is well defined. Innovation awareness is spread across the major business units such as R&D, marketing, manufacturing that involves innovation in their processes. Resource is allocated adequately for innovation to kick off.

the Maturity Model

3. Strategic

The innovation process is systematic, and becomes a standard within the organization. The company shares a vision that innovation is core to company success and becomes a main business strategy of the company. Innovation awareness therefore is at corporate level. Resource for innovation activities is sufficient and is properly planned.

4. Optimized

Optimization is made to innovation process and other innovation related activities in order to achieve better efficiency and effectiveness. Relationships with external parties such as suppliers and distributors, customer must be improved at this stage. Information and knowledge that gathered from innovation experience must be understood and widely accessible.

the Maturity Model

5. Adaptive

Information and knowledge from innovation experiences are systematically gathered to make it useful in the innovation process and add values to the organization. A learning organization is built for adapting to external environmental change that affects innovation direction.

Maturity Model for Innovation Capability

Limitation of the Maturity Model

- cannot guarantee the success of products
- not a silver bullet => not address all the issues
- top-down framework : should use other bottom-up approaches to compensate and balance the limitations
- rather new; need more actual practices

Case Studies :
Apple Computer, Inc. & iPod

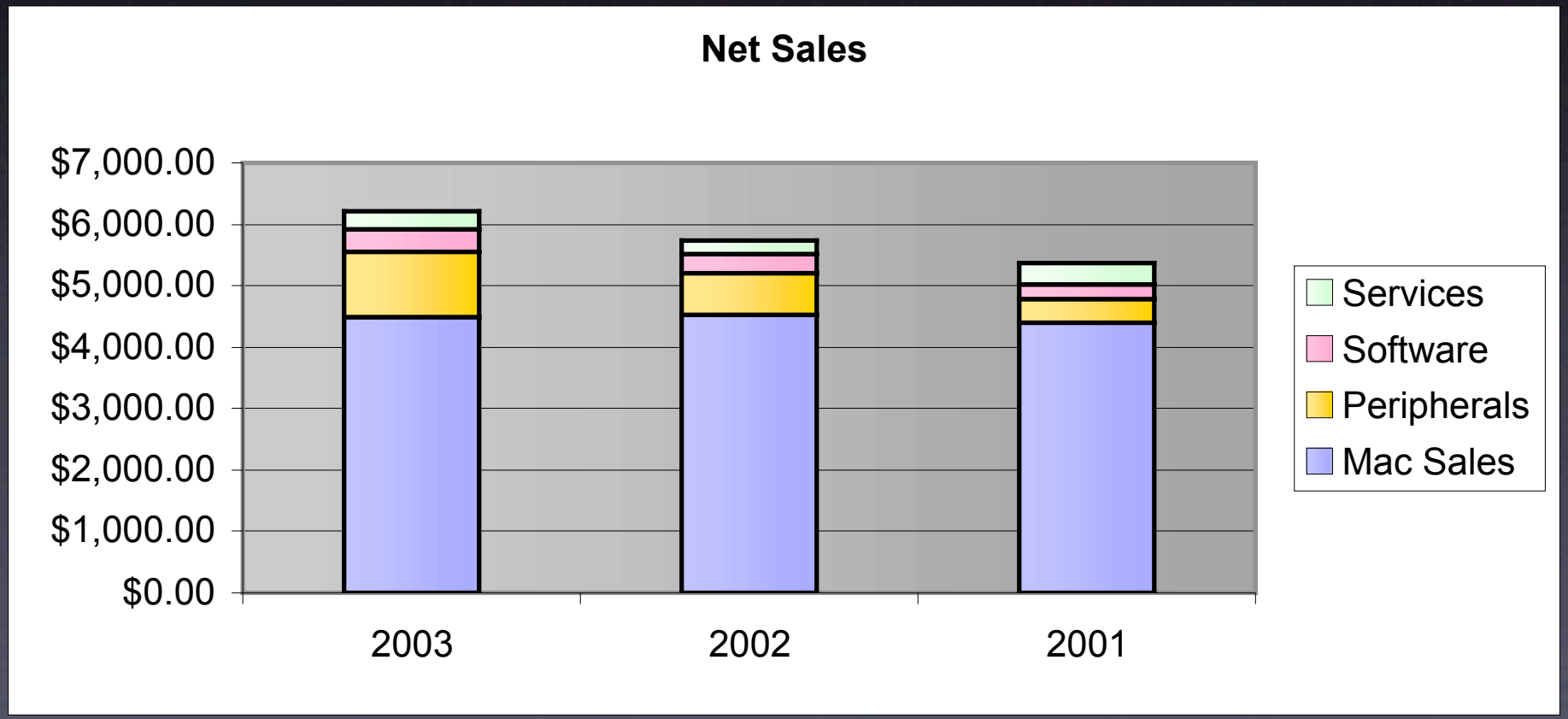
- Background
  - incorporated on Jan 3, 1977
  - 27th anniversary
  - Products
    - Macintosh desktop and notebook computer
    - Mac OS X operation systems
    - iPod digital players
    - collection of software and peripherals

Case Studies :
Apple Computer, Inc. & iPod

- Business Strategy
  - Digital hub - bringing best personal computing experience by combining functions from digital devices and software
  - Retail - operates its own retail store and online store, reduce channel sales importance
  - Education
  - Creative professionals

Case Studies :
Apple Computer, Inc. & iPod

- Financial Performance



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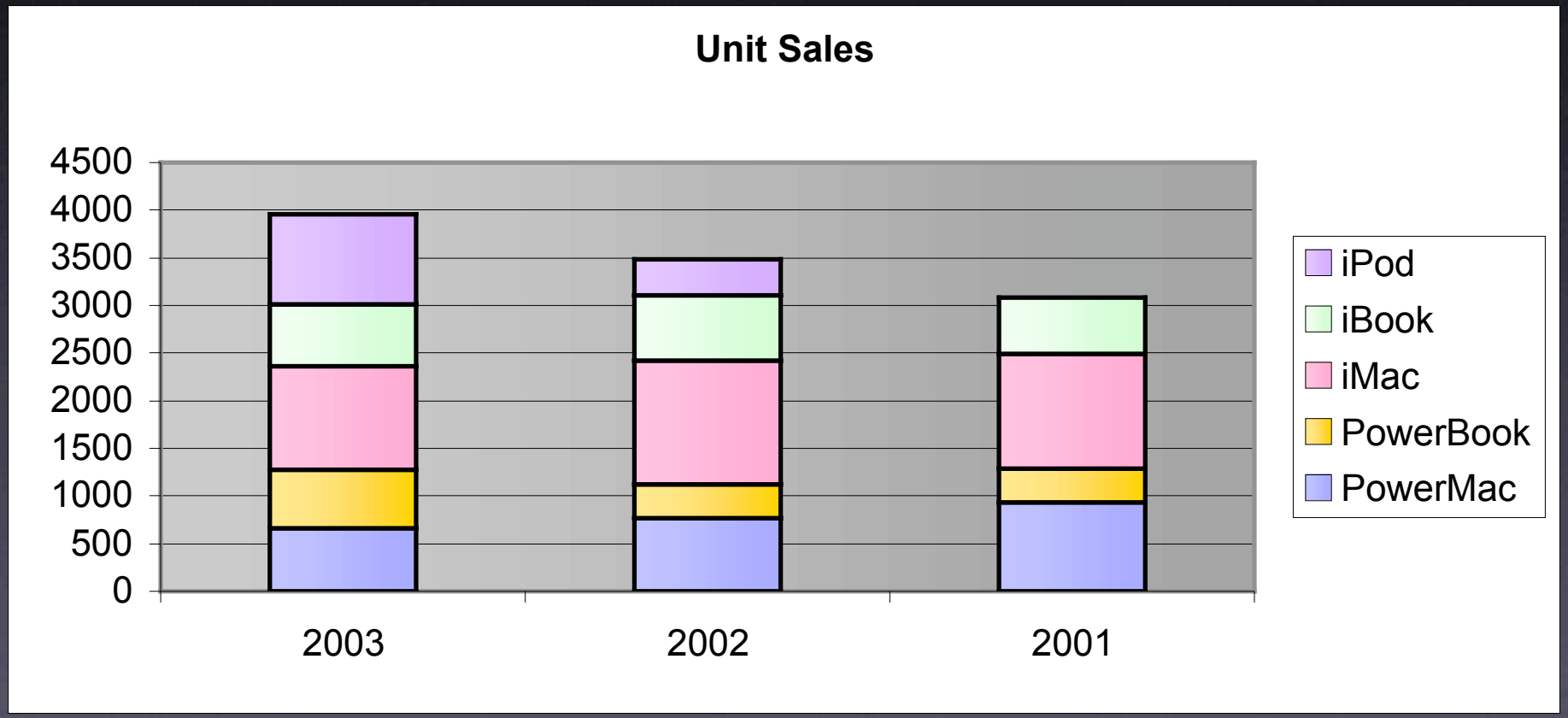

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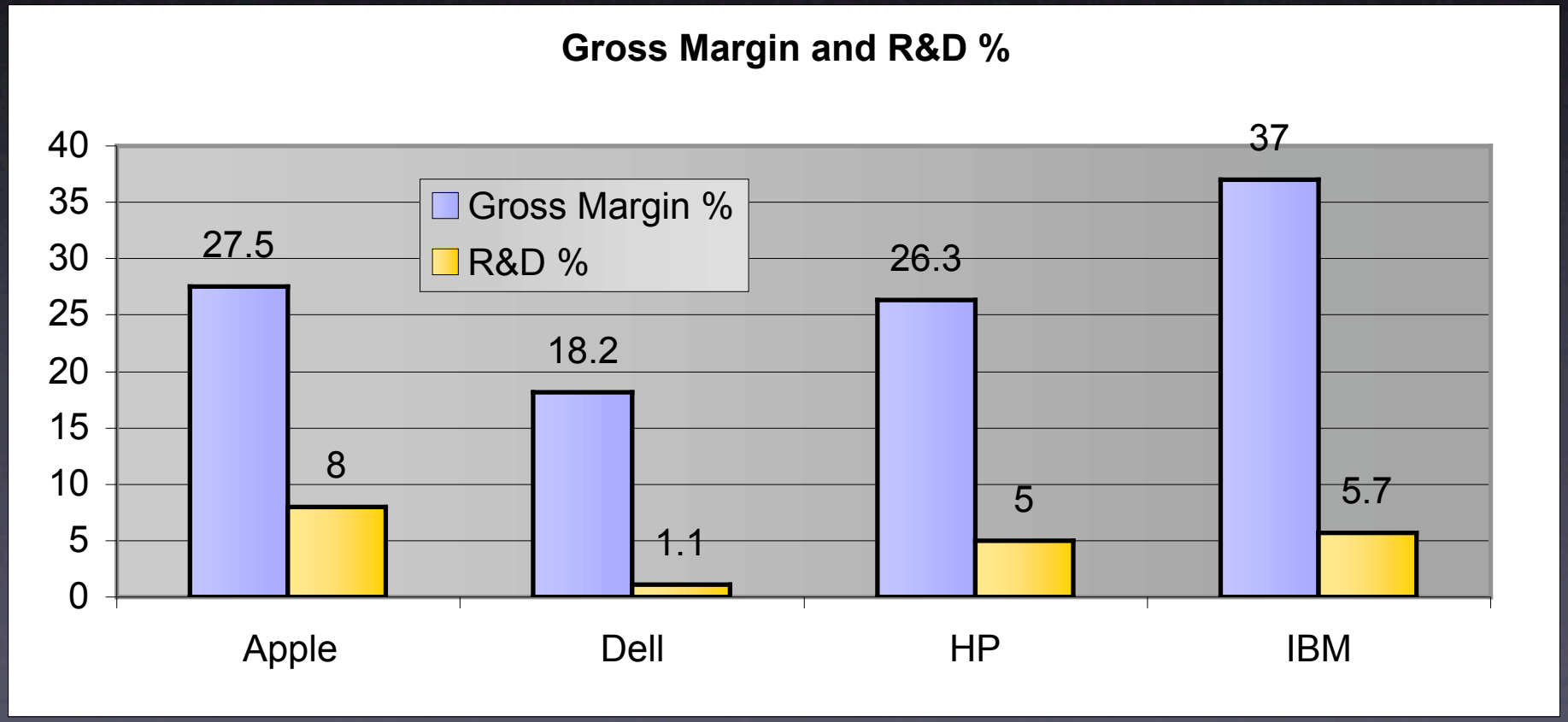


Case Studies :
Apple Computer, Inc. & iPod

- R&D
  - $471, $446 & $430 M in 2003, 2002 & 2001
  - 189, 178, 144 patents filed
- Technology Alliance & Adoption
  - support open standards : Firewire, MPEG4
  - adoption of right technologies : Firewire, AirPort
  - open source software

Case Studies :
Apple Computer, Inc. & iPod

- Merger & Acquisition
  - Not very active
  - Important buyout: NeXT, Emagic & PowerSchool
  - meet their strategy

Case Studies :
Apple Computer, Inc. & iPod

- Marketing
  - 20% of net sales
  - strong brand image
  - innovative product name: iMac, iPod, iLife
  - using marketing name, not technical name :
    Firewire for IEEE1394, QuickTime for movie standard, Rendezvous for multicast DNS, AirPort & AirPort Express for 802.11b & 802.11g

Case Studies :
Apple Computer, Inc. & iPod

- Senior Management & Product Champions
  - Steve Jobs, CEO
  - Philip Schiller, Worldwide Product Marketing
  - Jonathan Rubinstein for Hardware Engineering
  - Avadis Tevanian for Software Technology
  - Sina Tamaddon for Application

iPod and Music Business

- iPod
  - first introduced in Oct 2001
  - hard disk based - 1.8”
  - 5GB - 1200 songs
  - impressive hardware design, simple interface

iPod and Music Business

- 2nd Generation - replace mechanical wheel to solid-state touch wheel
- 3rd Generation - dock connector, Mac & PC
- 4th Generation - cheaper, thinner, lighter with redesigned interface (ClickWheel)

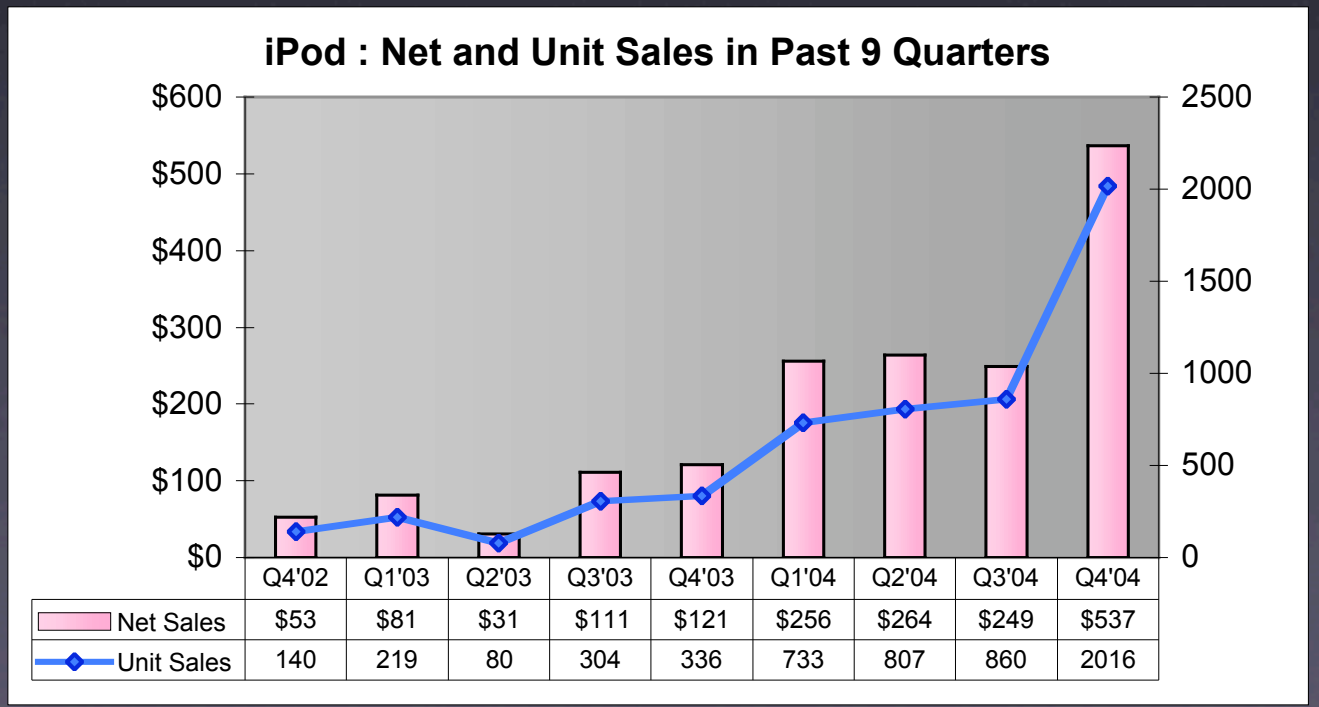
iPod and Music Business

- iPod mini
  - introduced Jan 2004
  - smaller, 5 stylish colors
  - 1” 4GB hard disk

  - Steve Jobs: “while iPod is leader in high-end, disk-based portable player market, we want to compete with high-end flash-based players with 512MB capacity.”
  - sold at $249, the same price range to 512MB players ($200 - $300)

iPod and Music Business

- Q3’03 - sales of 3G iPod (Mac & PC)
- Q1’04 - seasonal sales and iTunes Music Stores
- Q4’04 - iPod mini ships internationally Music Stores in UK, FR & DE



	Q4'02	Q1'03	Q2'03	Q3'03	Q4'03	Q1'04	Q2'04	Q3'04	Q4'04
Net Sales	$53	$81	$31	$111	$121	$256	$264	$249	$537
Unit Sales	140	219	80	304	336	733	807	860	2016

iPod and Music Business

- iTunes and iTunes Music Stores
  - not making money, but to boost iPod sales
- iTunes
  - previously as MP3 jukebox for Mac
  - new version support both Mac & PC - the same time 3G iPod is introduced
  - added DRM and access to iTunes Music Stores - the same time ITMS launched
  - Digital Music Management Software

iPod and Music Business

- iTunes Music Stores
  - launched on April 2003
  - $0.99 for song and $9.99 for album - US only
  - June 2004 - UK, FR & DE
  - 100 million songs sold - July 2004
  - * Change the way people think: downloading music is illegal, now become legal
  - * Digital Rights Management

iPod and Music Business

iPod + iTunes + iTunes Music Stores

(Hardware) + (Software) + (Content)

=

end-to-end music offering

Conclusions

- What kind of company Apple is?
  - experience design company - Digital Hub, iMac, iPod + iTunes + ITSM
- Technical Alliance - joining open groups
- Technology Adoption - many products are in Innovators & Early Adopters categories
- M&A - relatively low, but right targets

Conclusions

- R&D spending - 8%, more than industry leaders
- Patent filing - adequate
- sustain mainstream products (Mac) and able to develop successful newstream product (iPod)
- iPod + iTunes + ITMS : demonstrates strong communications between top management & various R&D teams
- Sales and Marketing : retail and online stores, strong brand image, better understanding user buying experience

Problems & Recommendations

- Mac sales stay flat
  - Mac sales provide resource for newstream innovation (iPod)
  - newstream activities generate value and knowledge => further strengthen innovation capability that helps mainstream
- iPod + iTunes + ITMS
  - Develop more consumer electronic products
  - combining hardware, software, content & services

Problems & Recommendations

- Out-sourced manufacturing to ODM - time-to-market is important for innovative products
  - improve manufacturer relationship
  - faster & easier to implement
- Apple experienced limited quantities of important components - G5 from IBM, 1" HD from Hitachi
  - improve supplier relationship
  - better planning and estimation of supplier's inventory level

Applying the Maturity Model

- Recognized as high innovative company
- Achieve Level 3 only (Strategic)
- For higher maturity level:
  - improve supplier and manufacturer relationships
  - knowledge of learning experience to flow back to organization level for improving mainstream products

Maturity Model for Innovation Capability

Thank you!