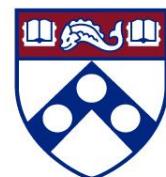


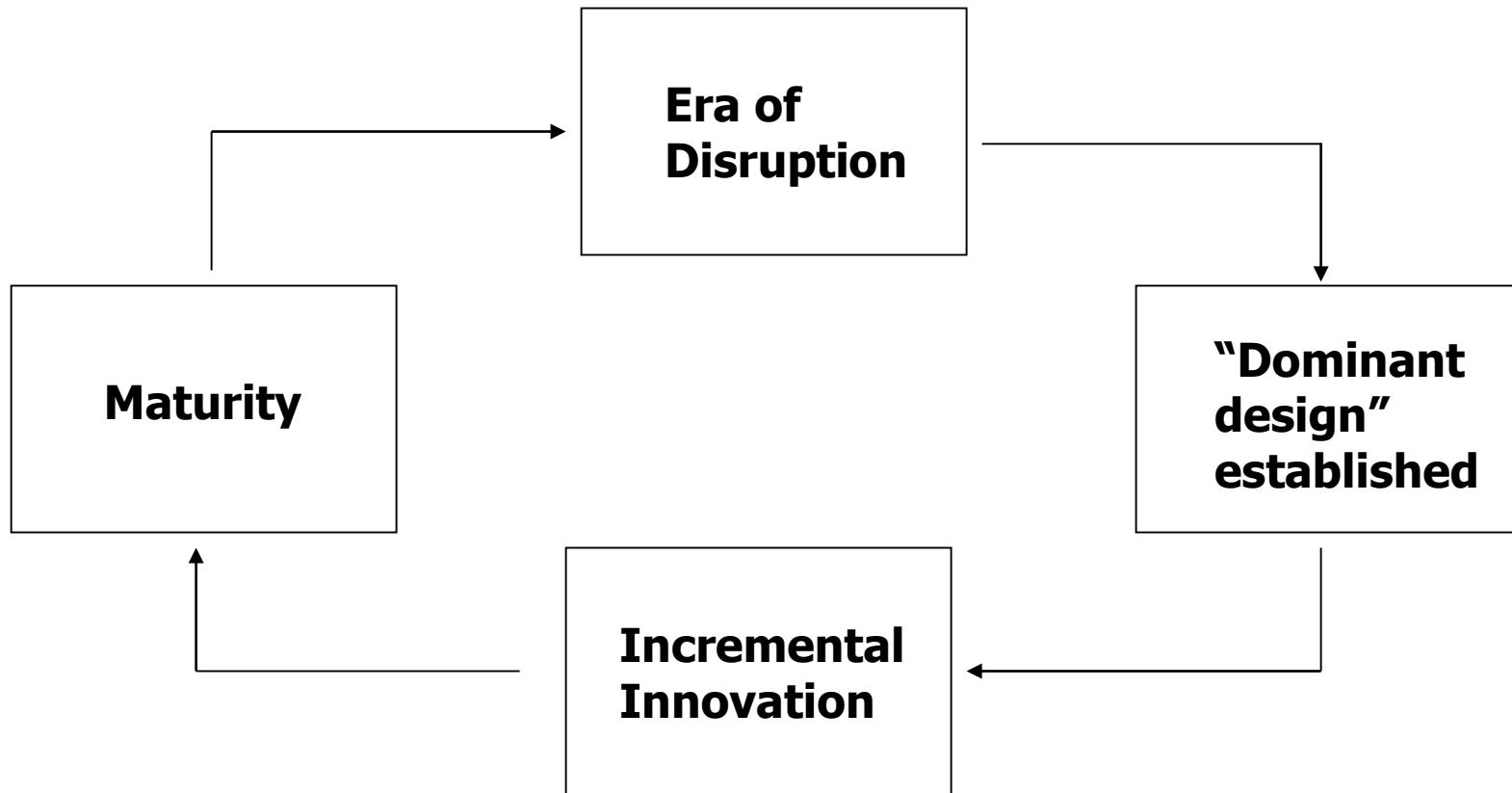
Digital Disruption: Strategy, Organization, and Leadership Perspectives

Rahul Kapoor



Wharton
UNIVERSITY *of* PENNSYLVANIA

Model of Industry Disruption



Era of Disruption in Automobiles (Late 19th Century)



Steam Cars



Internal Combustion Cars



Electric Cars

Era of Disruption in E-Readers (2000s)



Que	Skiff	Alex	eDGe	E6 and E101	Copia	Cybook ORIZON
Maker	Plastic Logic	A division of Hearst Corp.	Spring Design	Entourage Systems	Samsung	Bookeen
Price	\$649 for 4 GB and Wi-Fi; \$799 for 8 GB and Wi-Fi plus 3G wireless	TBA	\$359	\$490	\$399 for 6" screen and \$699 for 10"	Prices will range from \$199-\$299
Availability	Begins shipping in mid-April, later sold in Barnes & Noble stores	Date TBA, will be sold in Sprint stores and elsewhere	Can be purchased starting Feb. 22 online, stores TBA	Can be ordered online now, shipping in February	Early this year	Public Thecopia.com beta launches in March; devices begin selling online in April
Features	Wireless, 10.7" shatter-proof plastic screen, targeting business	Slightly flexible 11.5" touch screen optimized for periodicals	Additional 3.5" color screen that can browse the Web	Features two screens, including 10.1 color LCD screen and 9.7 inch E Ink screen	Six and ten-inch touch screen can accept handwriting with stylus	Six different Copia devices access social networking site to browse and purchase books

Photos: the companies; Business Wire (Copia)

The Wall Street Journal, Jan 7, 2010

Era of Disruption in Virtual Reality (Today)



Fintech in Finance



- Laying of first trans-Atlantic cable
- Telegraph

Rapid transmission of financial information and payment led to growth in financial services

- Electronic payments and clearing systems
- ATMs and Online banking

Use of information technology by traditional financial institutions to enhance products and services

- Mobile devices
- Digital platforms
- AI, Blockchain

New disruptive landscape comprising of traditional financial institutions, fintech start-ups and Big Tech

Adapted from Consumers International (2017)

We are in an Era of Disruption in Financial Services

Emerging Digital Technologies (Artificial Intelligence, Blockchain, Mobile Devices/IoT)		
Incumbents	Fintech Start-ups	Big Tech
Platform Business Models (Lending, Payments, Marketplace for products/services)		

Major Disruptive Trends Fueled by Digital Technologies Today

- 3d Printing
- 5G Connectivity
- Artificial Intelligence
- Augmented/Virtual Reality
- Blockchain
- Cloud Computing
- Genomics
- Internet Of Things
- Quantum Computing
- Robotics

Threaten the status quo in a broad array of industries but also present significant opportunities for innovation and long-term growth

Definitions

Digital Disruption

“The emergence and eventual dominance of digital technologies as a basis of value creation in a given market”

Digital Transformation

“The process of leveraging emerging digital technologies to create and capture enterprise-level value in a sustainable manner”

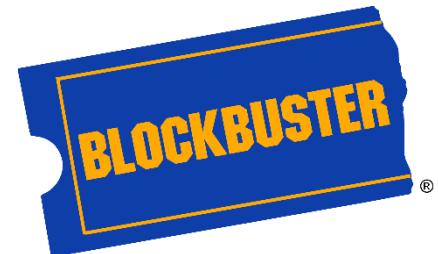
Cases of Once Successful Firms Disrupted By New Digital Technologies



BORDERS
®

SEARS

X
XEROX.®



NOKIA

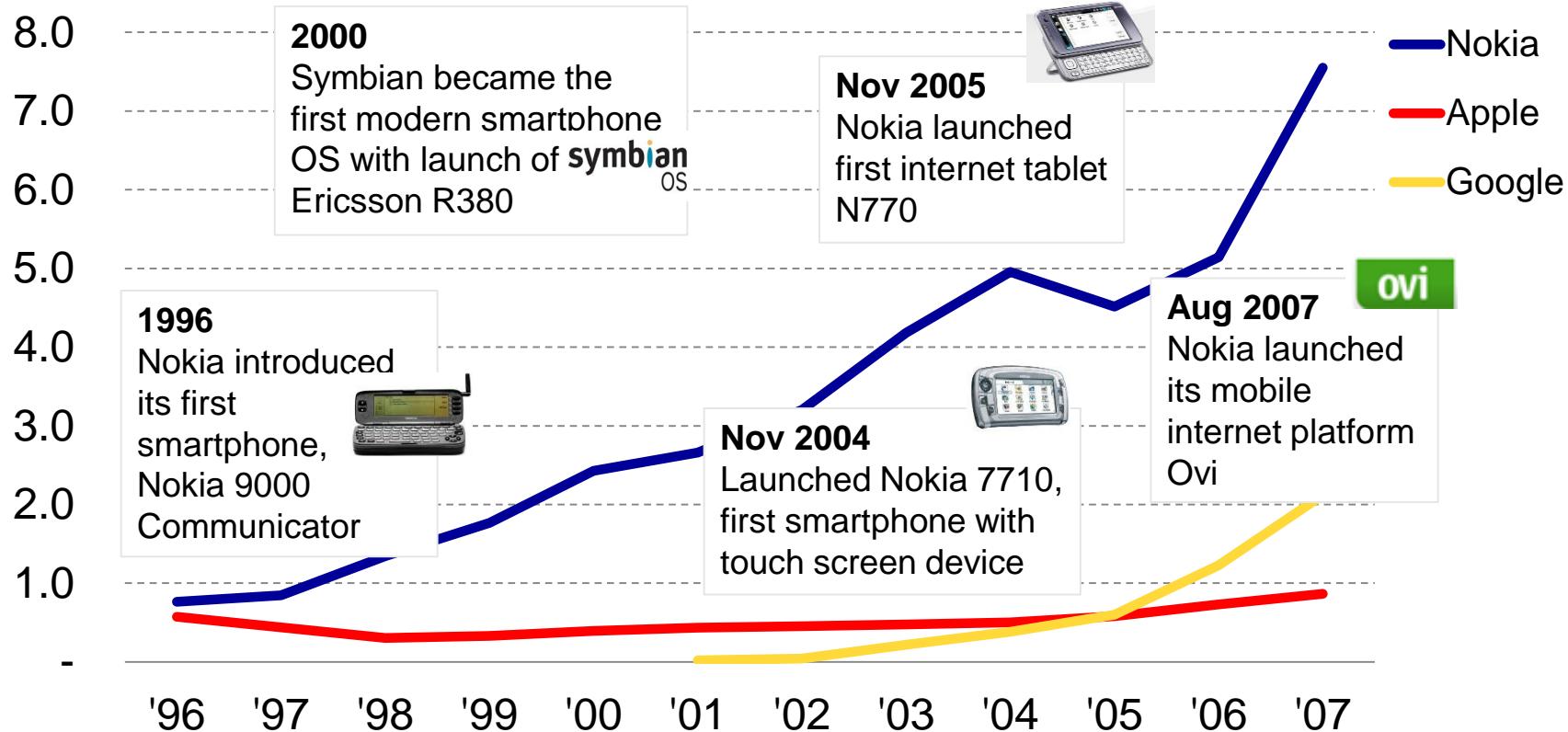
RIM®

digital

The Nokia Problem!

Anticipating the emergence of smartphones in 1990s, Nokia outspent rivals on R&D and created a series of innovations

R&D Expenses (US\$ Bn) and Key Innovations



The Xerox Problem!



New Firms That Have Carried the Flag of Digital Disruption and Benefited from Digital Opportunities



NETFLIX



Tencent

amazon

UBER



Google



Established Firms Successfully Managing Digital Transformation



FUJIFILM

Adobe

CISCO



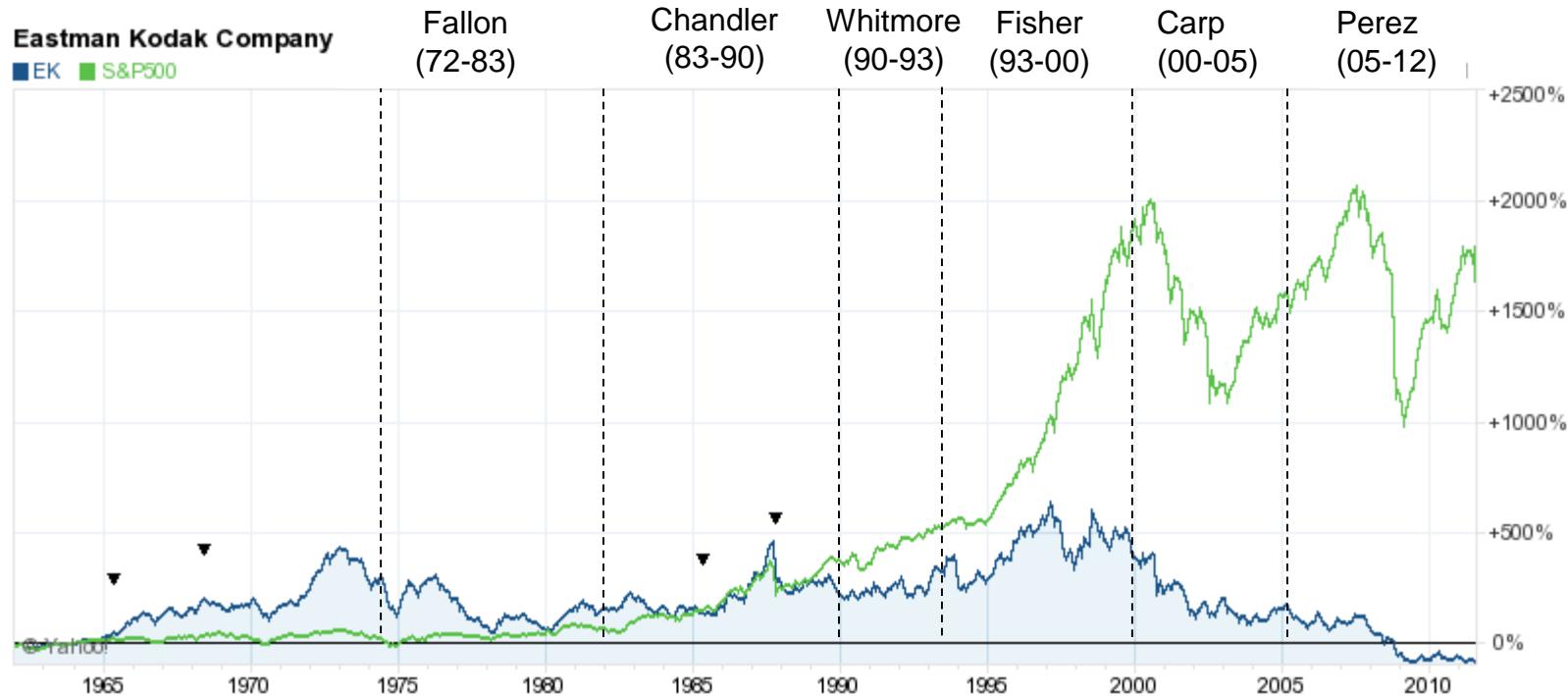
Walmart

ORACLE

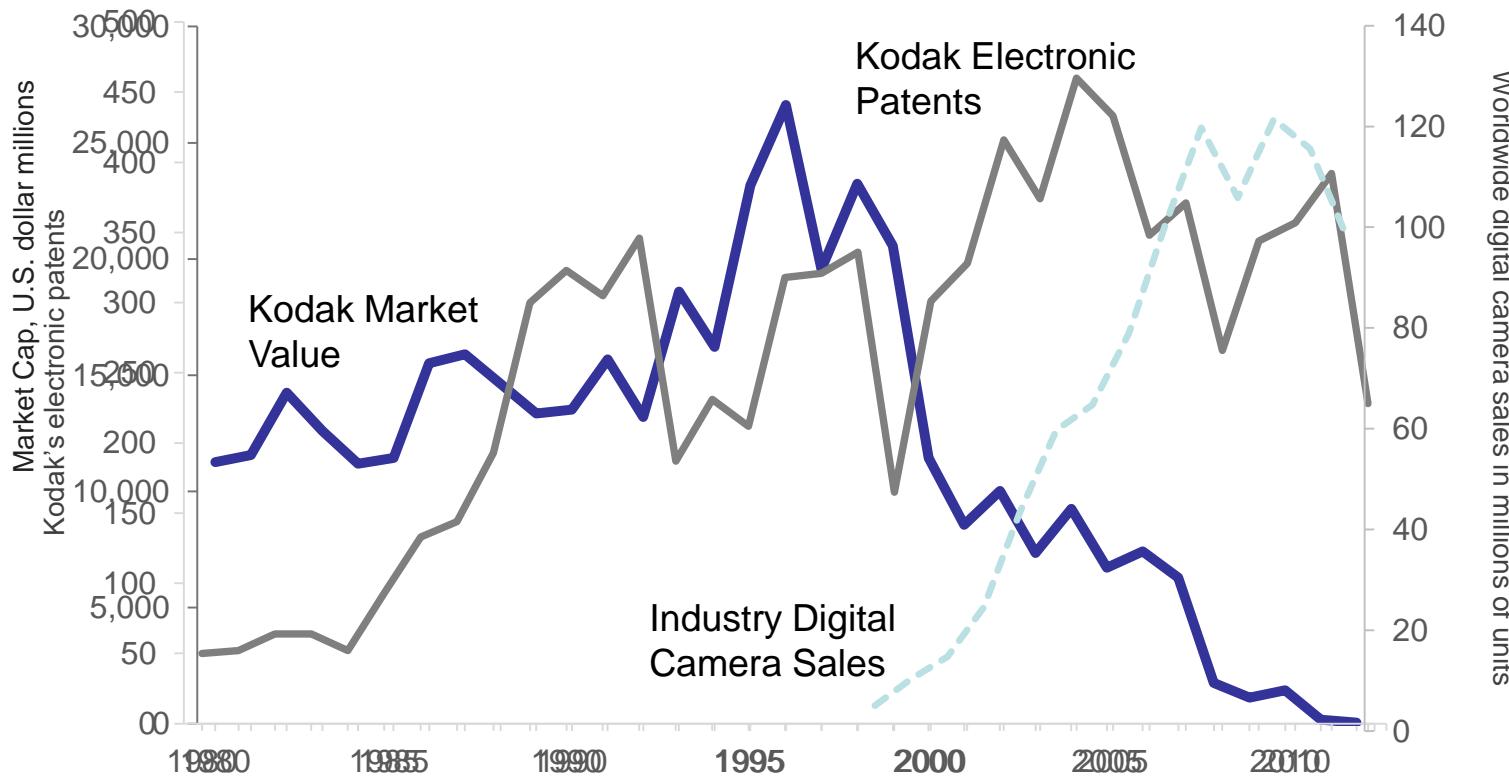
Management of Digital Disruption



Kodak: The Very First Casualty of Digital Disruption

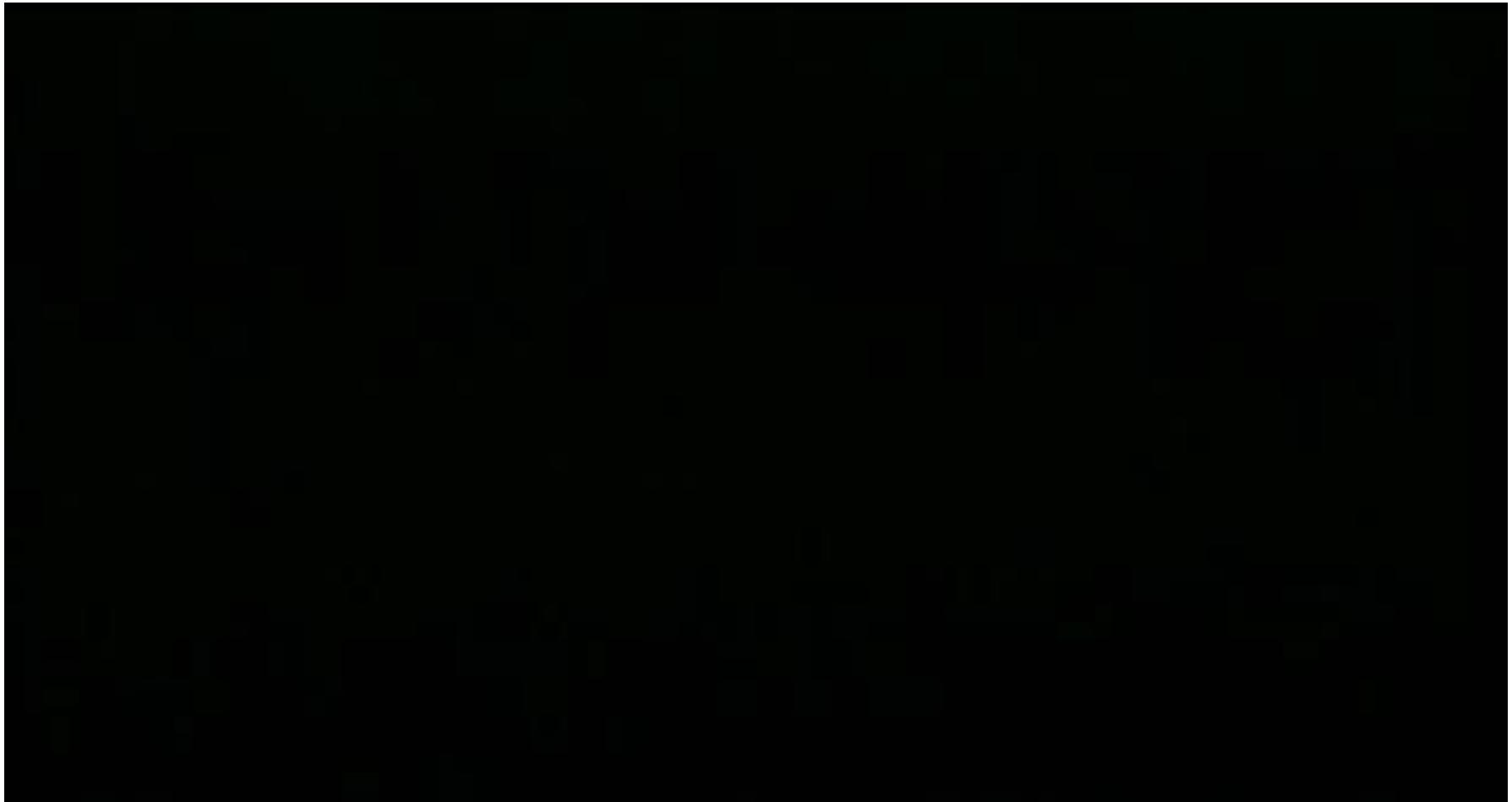


Kodak's Experience in Numbers

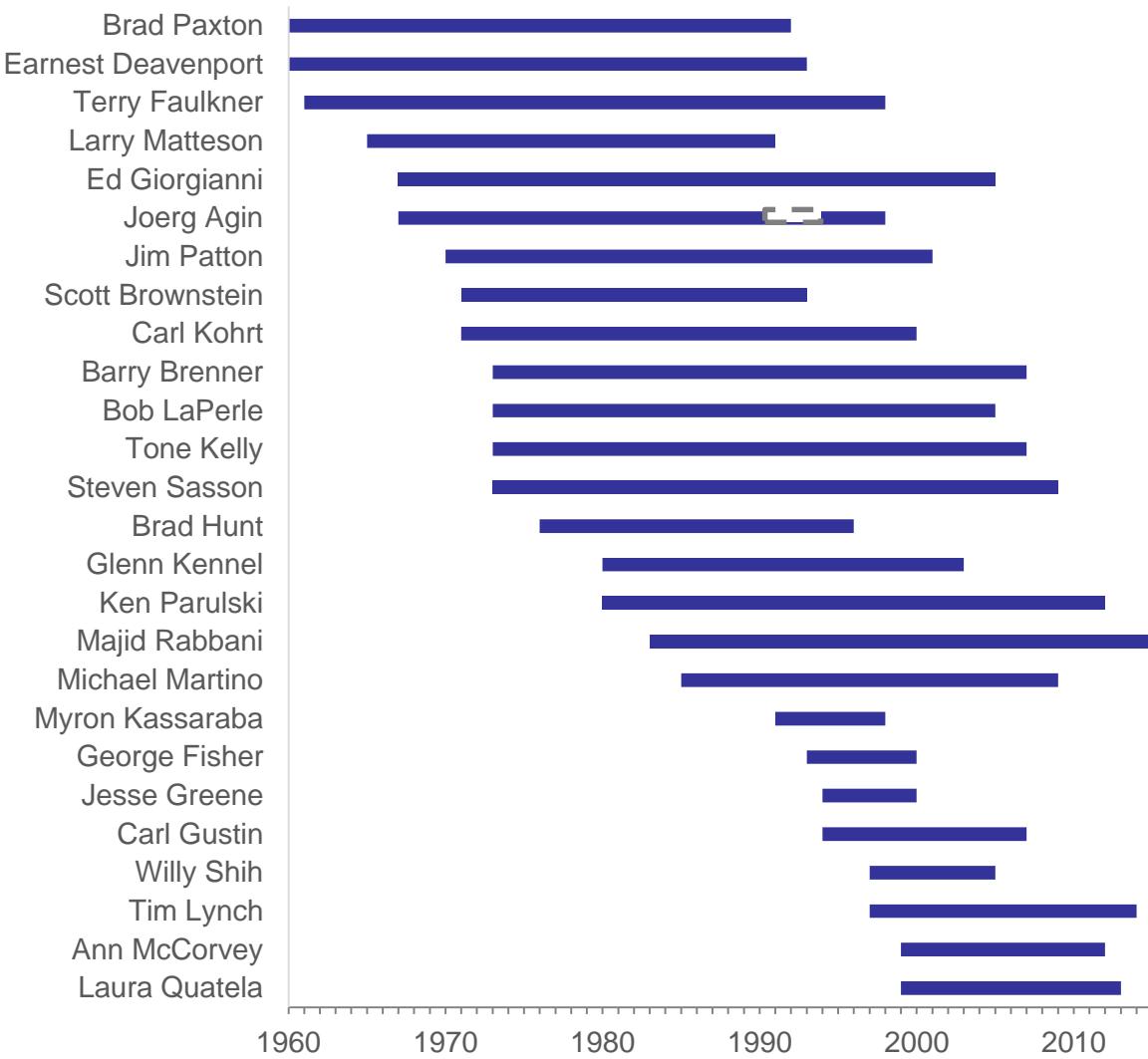


Source: Vinokurova and Kapoor (2022)

An Interesting Video



Down the Kodak Memory Lane: Interviewees



Eastman
Kodak
Company



DIGIT WORKS EVOLUTION COMPOS

C. Bradley Hunt,

38

1988-2008 © Eastman Kodak Company

POPULAR PHOTOGRAPHY/AP

DIGIT WORKS EVOLUTION COMPOS

C. Bradley Hunt,

38

1988-2008 © Eastman Kodak Company

POPULAR PHOTOGRAPHY/AP

THE FIRST ADVANCED PHOTO SYSTEM WAVE ROARS IN

Dan Richards

With the official announcement of the Advanced Photo System by Kodak on February 1 came a flood of new cameras and system accessories from the Big Five of APS. Herewith, a rundown of those models revealed at press time. If some of the APS technical terms look unfamiliar, take a look at this month's "SLR" and "Point & Shoot" (pages 23 and 28) for a discussion of them. These columns also contain detailed specs of the APS cameras introduced by Minolta.

Underscoring its position as the lead player in the APS game, Kodak unveiled the largest number of APS cameras—nine—ranging from a single-use model up to a 4X zoom camera with most of the current APS bells and whistles.

Starting from the top of the line, the Advantix 5600MRX Text-Date Zoom may look very familiar to those who have already sneaked a peek at this month's "Point & Shoot." It is indeed the Minolta Vectis 40, dressed in Kodak livery, and has the same specs and capabilities of that camera. Like Minolta, Kodak had not set a list price for the camera at press time.

The Advantix 4100ix Zoom is a pocketable model with a 30-60mm f/4.5-8.5 lens (including aspheric surfaces). Equivalent to a 38-76mm lens, it focuses to two feet in 80-zone active

Kodak: 9 models span single use to sophisticated



autofocusing, has a magnetic head to provide most of the advanced IX (information exchange) data designed to improve print quality, but does not have the midroll change feature. List price is set at \$229.95.

The Advantix 3700ix camera is something of a showcase model for

Kodak; if you recall last month's issue, it was the yet-unseen model featured on the cover, and used for shots in the tech view inside. With styling like the K1 Cameo but greater sophistication, the 3700ix has a 24mm (equivalent 35mm) f/3.6 Tessar-formula all-glass optic, passive AF to two feet in 200 zones, and uses the cobra flash originally de-

continued on page 20

TECHNICAL

Kodak

EasyShare 5300

All-in-One Printer

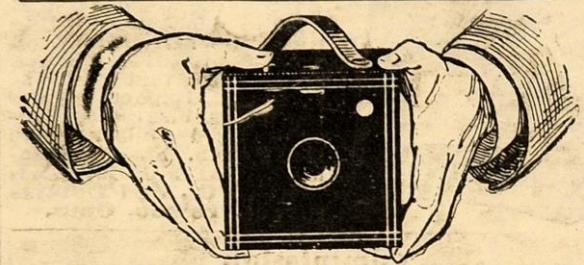


User's Guide
for Windows

Amateur Photography Equipment: From Glass Plate to Film Photography



There is no Kodak but the Eastman Kodak



Half the charm of a photographic outing is lost if one carries along several pounds of glass plates and holders and has every moment filled with anxiety for their safety.

KODAKS

use non-breakable film cartridges which weigh ounces where plates weigh pounds.

KODAKS \$5.00 to \$35.00.

EASTMAN KODAK CO.

Catalogues free
at agencies or by mail.

Rochester, N. Y.

Emergence of Snapshot Photography



Camera-film Business Model

If the cameras were the only thing that produced a profit, it would be no object to sell double the number and make only the same net profit; but before the camera is dead, we ought to make at least as much from the film used in it as from the camera itself, probably more. I believe that every camera is good for at least twenty spools of film.

George Eastman, 1894

The . . .

Pocket Kodak.

MADE WITH POCKET KODAK.

Size of Camera,
 $2\frac{3}{4} \times 2\frac{3}{8} \times 3\frac{3}{8}$.
Size of Picture,
 $1\frac{1}{2} \times 2$ inches.
Price.....

\$5⁰⁰

"One Button Does It,
You Press It."

*Big Pictures from
A Little Camera.*



Commitment to Innovation

I have come to think that the maintenance of a lead in the apparatus trade will depend greatly upon a rapid succession of changes and improvements. . . . If we can get out improved goods every year nobody will be able to follow us and compete with us

George Eastman, 1896



1901



1915



1930



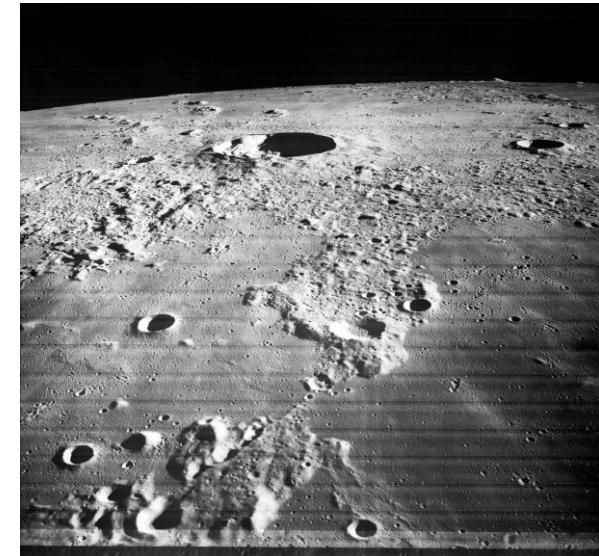
1950



1957

1950s-1960s: Wireless transfer of images from space

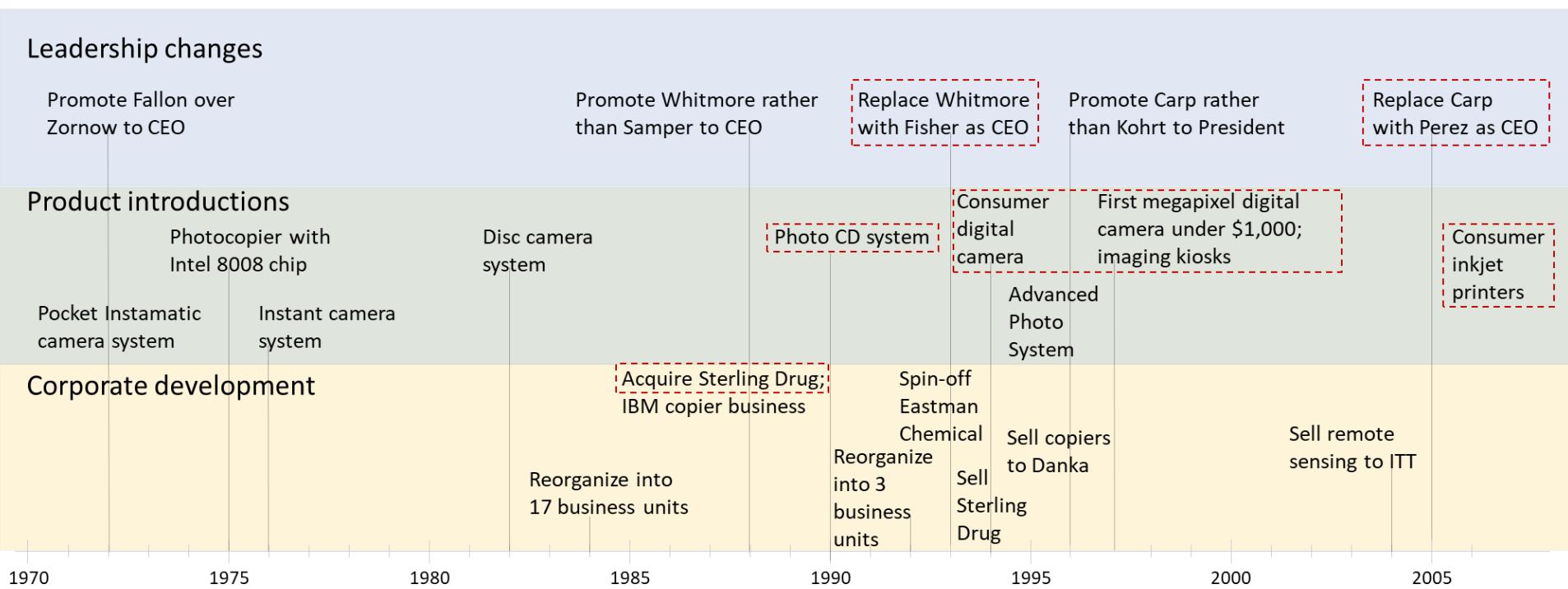
Exposing the film, transporting it, and processing it presented few difficulties compared to the enormously complex and time-consuming tasks of electronically scanning each negative frame, transforming its photographic content into analog signals, transmitting those signals to ground stations, and reforming the images in those stations. (Perry, 1973, p. 11)



Digital Innovation by Kodak and Competitors

	Fuji completed its first digital camera prototype (46,360 pixels)	Fuji introduced Fujix TV-Photo Player	Fuji introduced DS-1P the first consumer digital camera (400,000 pixels)	Apple introduced Quicktake 100 designed by Kodak (307,200 pixels)	Sharp introduced J-SH04, the first camera phone (110,000 pixels)				
Competitors	Sony demonstrated a prototype of the MAVICA, the first electronic analog camera (279,300 pixels)	Canon announced RC-701, electronic analog camera (382,200 pixels)	Dycam introduced Model 1, the first digital camera for sale in the U.S. (90,240 pixels)	Casio introduced QV-10, the first digital camera with LCD display.	Nokia introduced 7650, the first GSM camera phone (36,608 pixels)	Apple introduced the iPhone (2 megapixels)			
Kodak	First portable digital camera prototype (10,000 pixels)	Prototype of a TV-photo display unit	First megapixel CCD sensor (1.4 megapixel) Prototype of a digital camera (1.3 megapixel) First digital DSLR camera prototype; announced SV9600 first transceiver for transmitting high resolution images	Announced Photo CD system for storing and displaying images on TVs and computer displays	Introduced DCS 100, first professional digital camera, \$20,000 (1.3 megapixel) Opened Cinesite a digital editing center for motion picture film	Introduced DC40, point-and-shoot digital camera, \$960 (375,984 pixels) Introduced PalmPix, digital camera add-on for handheld personal digital organizers, \$149 (307,200 pixels) Introduced DC120, megapixel point-and-shoot camera, <\$1,000 Announced DCS Pro 14n, a 14 megapixel professional camera, \$4,995	Introduced EasyShare V5700 Zoom, the first dual lens digital camera, Easy Share V610 Dual Lens, the smallest camera to feature 10x optical zoom, EasyShare V705 Dual Lens, the smallest ultra-wide-angle optical zoom camera Introduced EasyShare C513 a 5 megapixel digital camera, <\$100		
	1975	1980	1985	1990	1995	2000	2005	17	2010

Three Levels of Key Decisions



Select Digital Innovations



Digital camera prototype developed by Steve Sasson at Kodak in 1975



SV8300—Kodak's first electronic still camera prototype developed in 1986

Kodak Photo CD Introduced in 1992



Your Photographs On Television. Larger than life. Incredibly sharp. The next generation of memories will be like nothing you've ever seen, thanks to a revolutionary new technology called the KODAK Photo CD System. It puts your favorite pictures on your television.

¶ Amazingly Simple. Take pictures the way you always have, using your current 35 mm camera and film. When you have your film developed, ask the photofinisher to transfer your photos onto a KODAK Photo CD Disc. Play the CD on a special KODAK Photo CD Player. **¶ Brilliant Images.** On your TV screen, you'll see vibrant, high-resolution images. Big, vivid pictures perfect for viewing with family and friends. Pictures you can actually change on-screen—resize, zoom in, and save the changes.

¶ Get Out That Shoe Box. Collect those old photos, slides, and negatives gathering dust in your closet and have your photofinisher create customized Photo CD picture albums. Each CD holds up to 100 pictures, and with the remote control you can view them in any order. It's a convenient, and lasting, way to save your memories. **¶ Sound And Vision.** The KODAK Photo CD Player is also a state-of-the-art audio CD player. That means when the Player isn't playing your pictures, it can play digital stereo sound. **¶ The Future Of Memories.** This next generation of memories will be the biggest, brightest, most unforgettable ever. You've got to see it. Ask your retailer for a demonstration. For the retailer nearest you, call 1-800-945-7200.

You won't believe the next generation.

Introducing the KODAK Photo CD System.

Your Pictures Have Never Been So Powerful.™

© Eastman Kodak Company, 1992. Kodak and Photo CD symbol are trademarks. The Photo CD symbol is for use by Kodak and its licensees only and may not be reproduced without permission from Kodak.

Kodak EasyShare Digital Cameras (Launched in 2001)



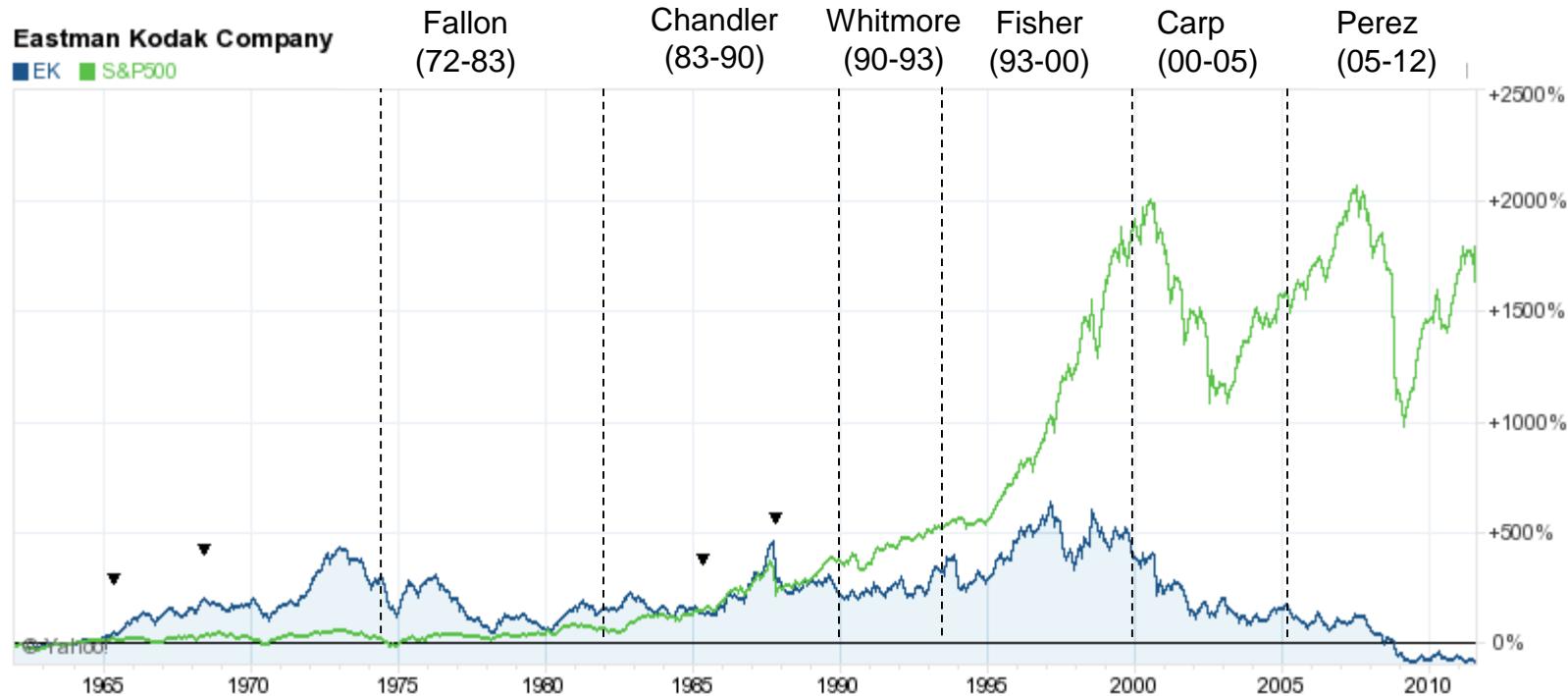
- Sold 7 million in First 3 years

Unpacking Kodak's Evolution

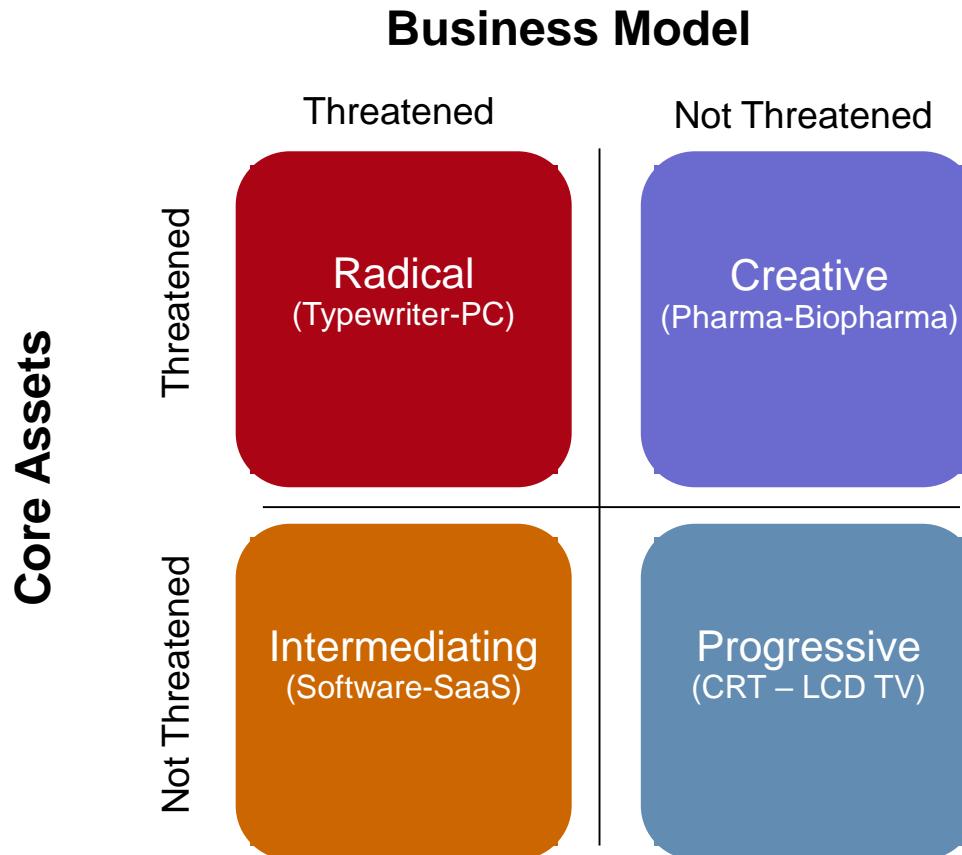


1. What made Kodak successful and dominate its industry for more than 100 years?
2. How did Kodak approach digital transformation during the Fallon, Chandler and Whitmore Eras (Early Years, 1970s-1993)
3. How did Kodak approach digital transformation during the Fisher and Carp Eras (Later Years, 1993-2005)
4. Why did Kodak fail?

Kodak: The Very First Casualty of Digital Disruption

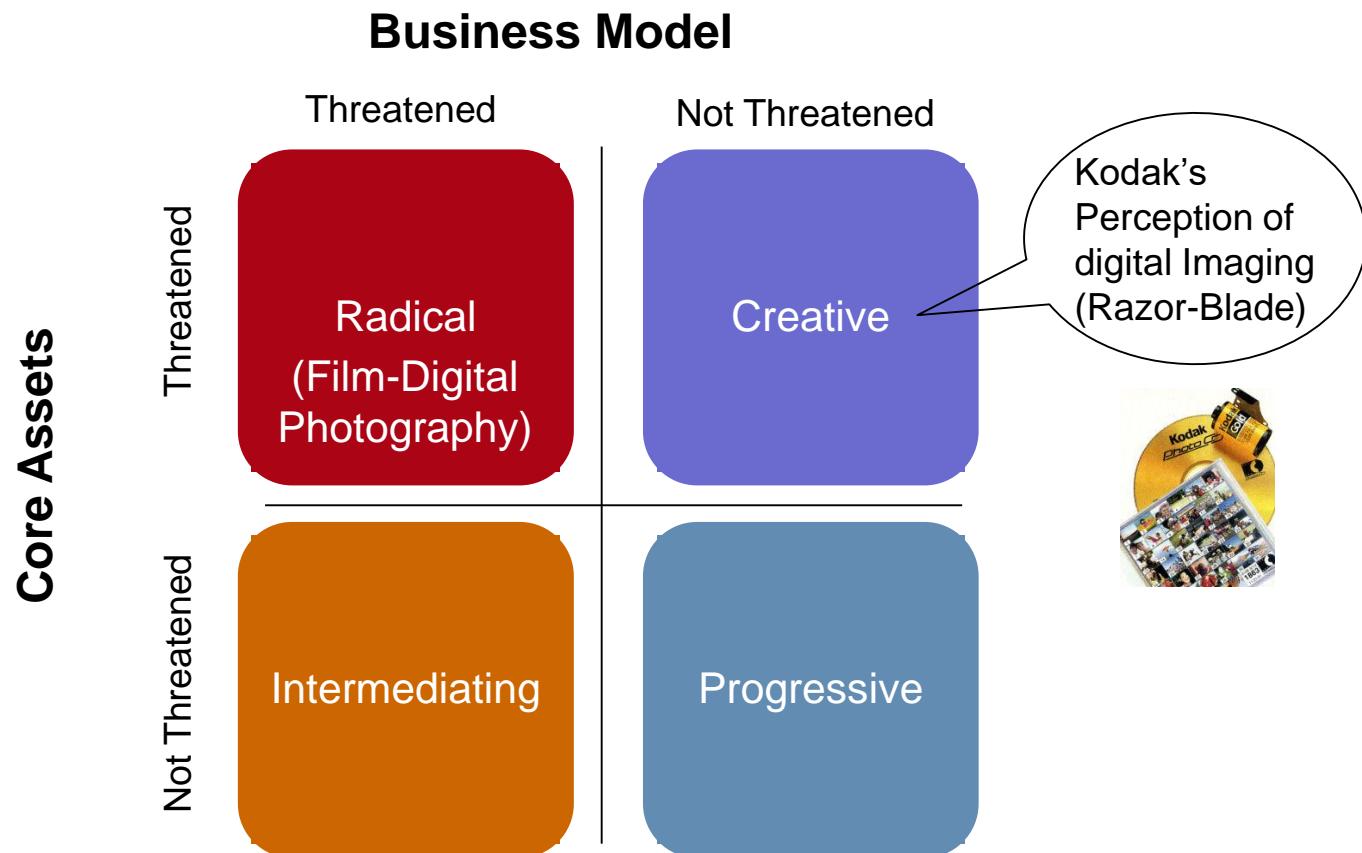


Issue 1: Flavors of Disruption



Adapted from McGahan, Anita (2004), "How Industries Change," *Harvard Business Review*, 82(10): 86-94

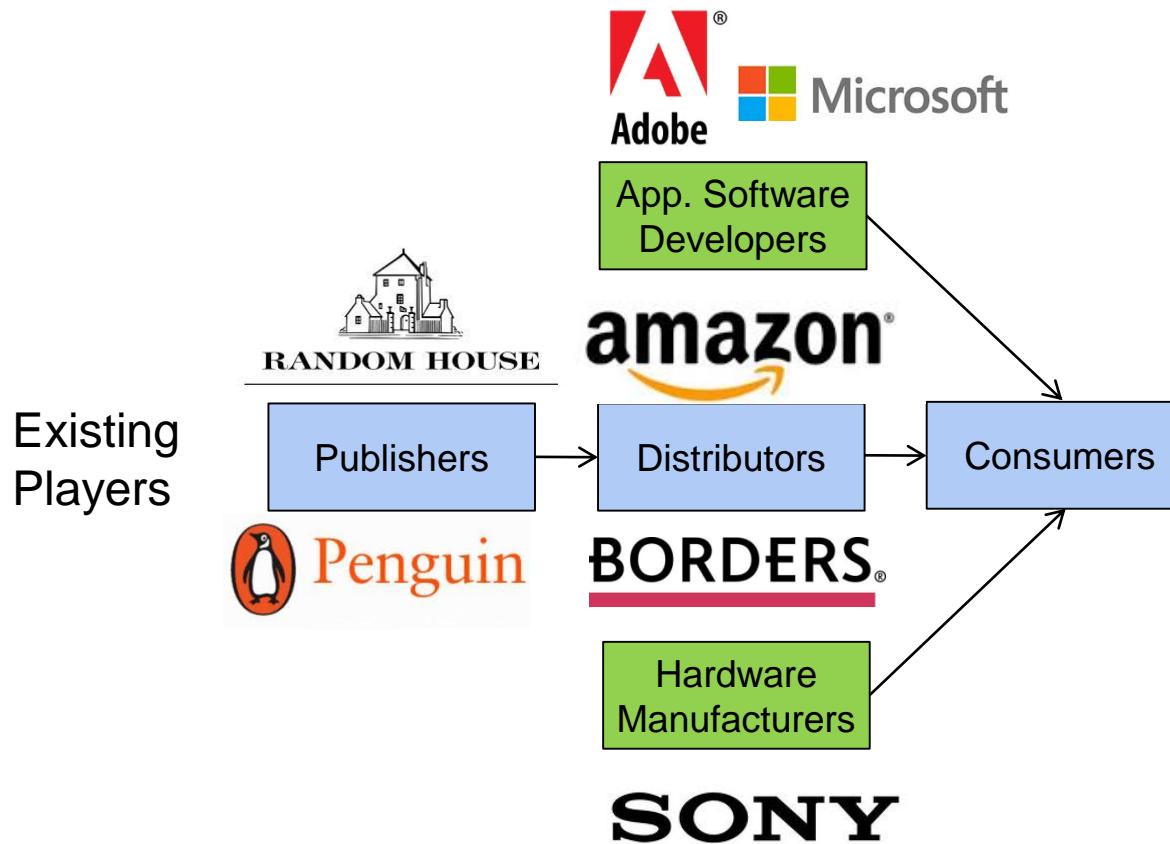
Kodak: Perception of Consumer Digital Imaging in 1990s



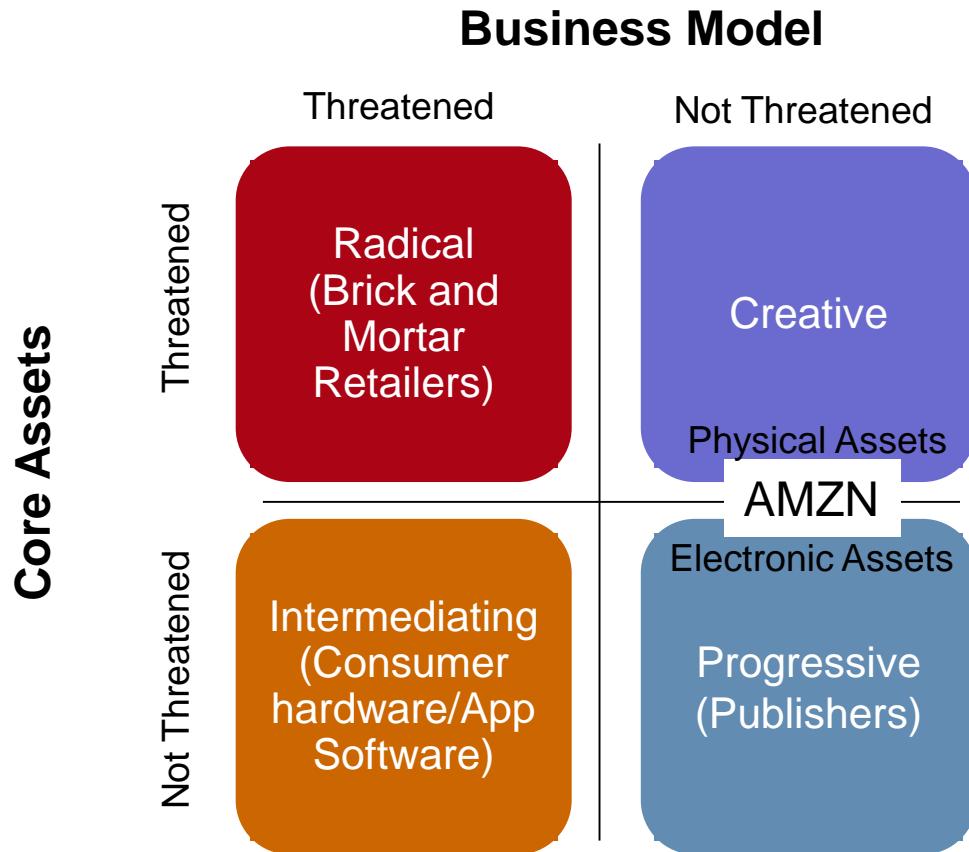
Change from Print to E-Books



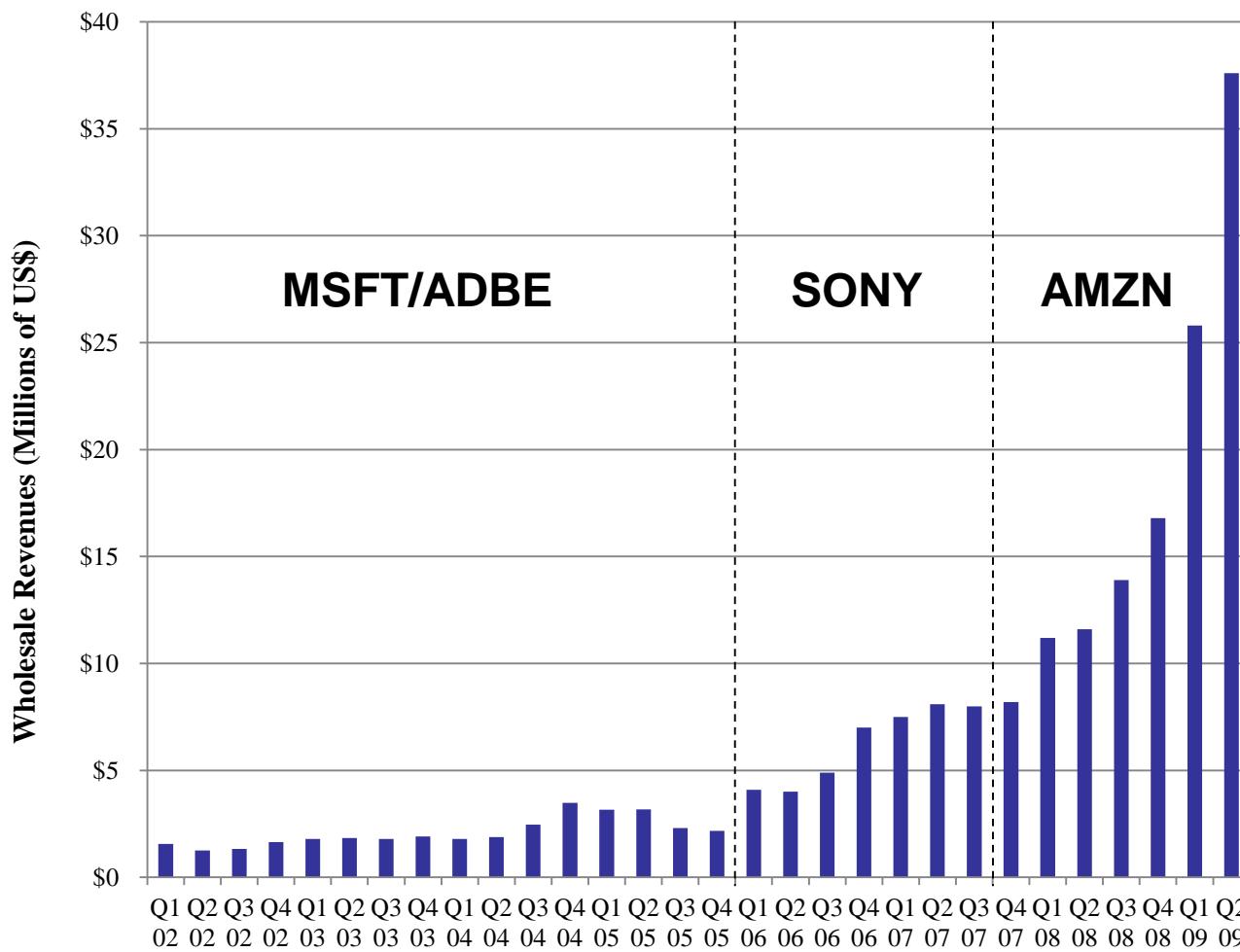
E-Book Ecosystem



Trajectory of Industry Change for Different Players



U.S. E-Book Sales



Source: Rahul Kapoor, Daniel Levinthal, and Dalglish Chew (2009), "E-Books in 2009: Did the Long Heralded Revolution Finally Arrive?", Wharton Case Study #48

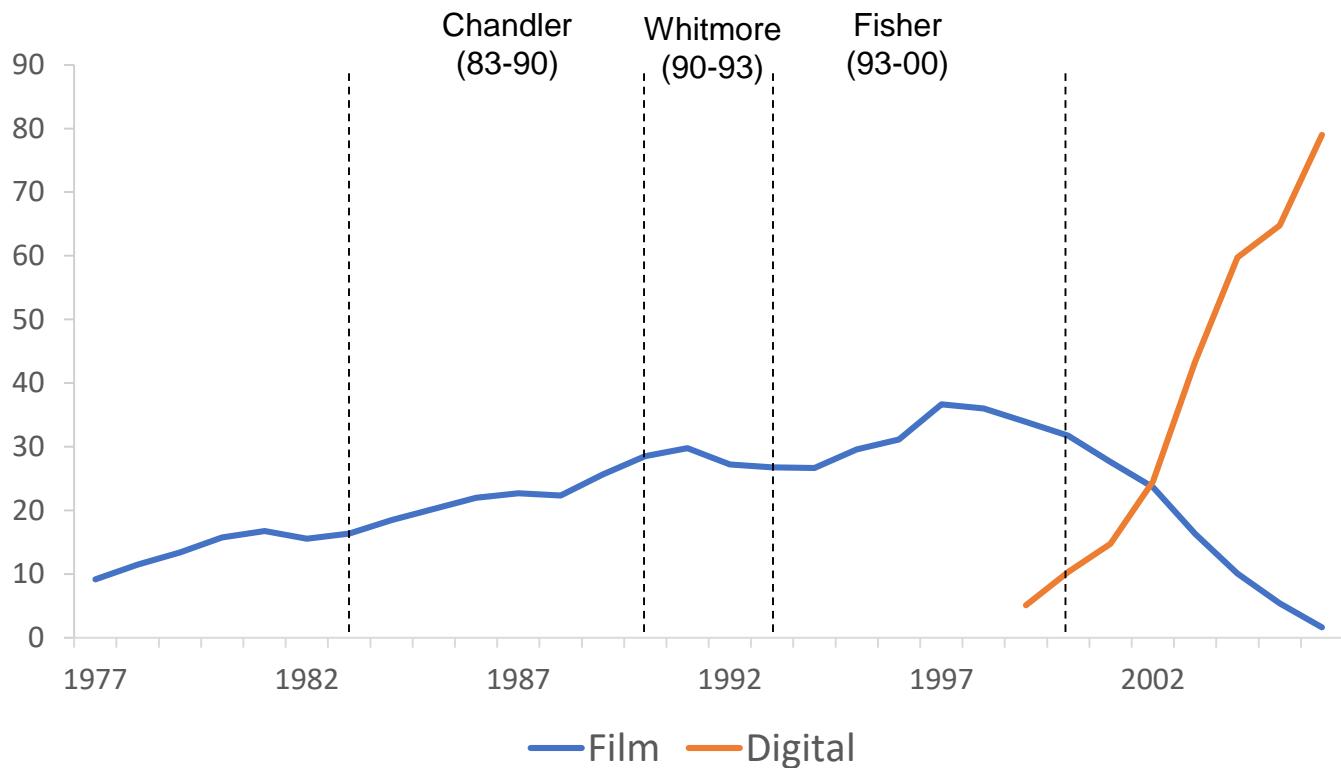
Issue 2: Timing of Disruption

“In 1981 Sony Corporation announced it would launch Mavica, a filmless digital camera”

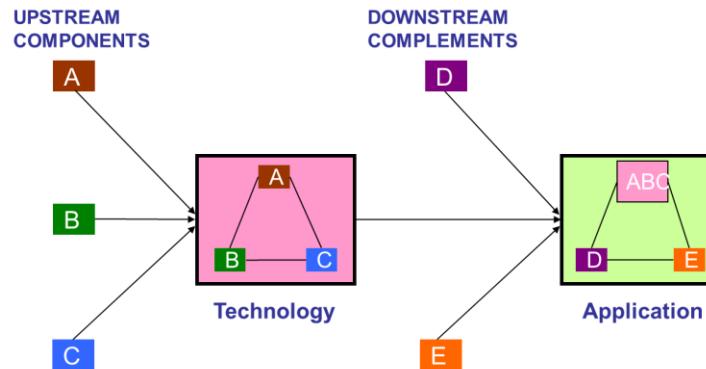


But, film-based photography remained dominant and profitable for almost 20 years after that

Worldwide Camera Sales (in millions of units)

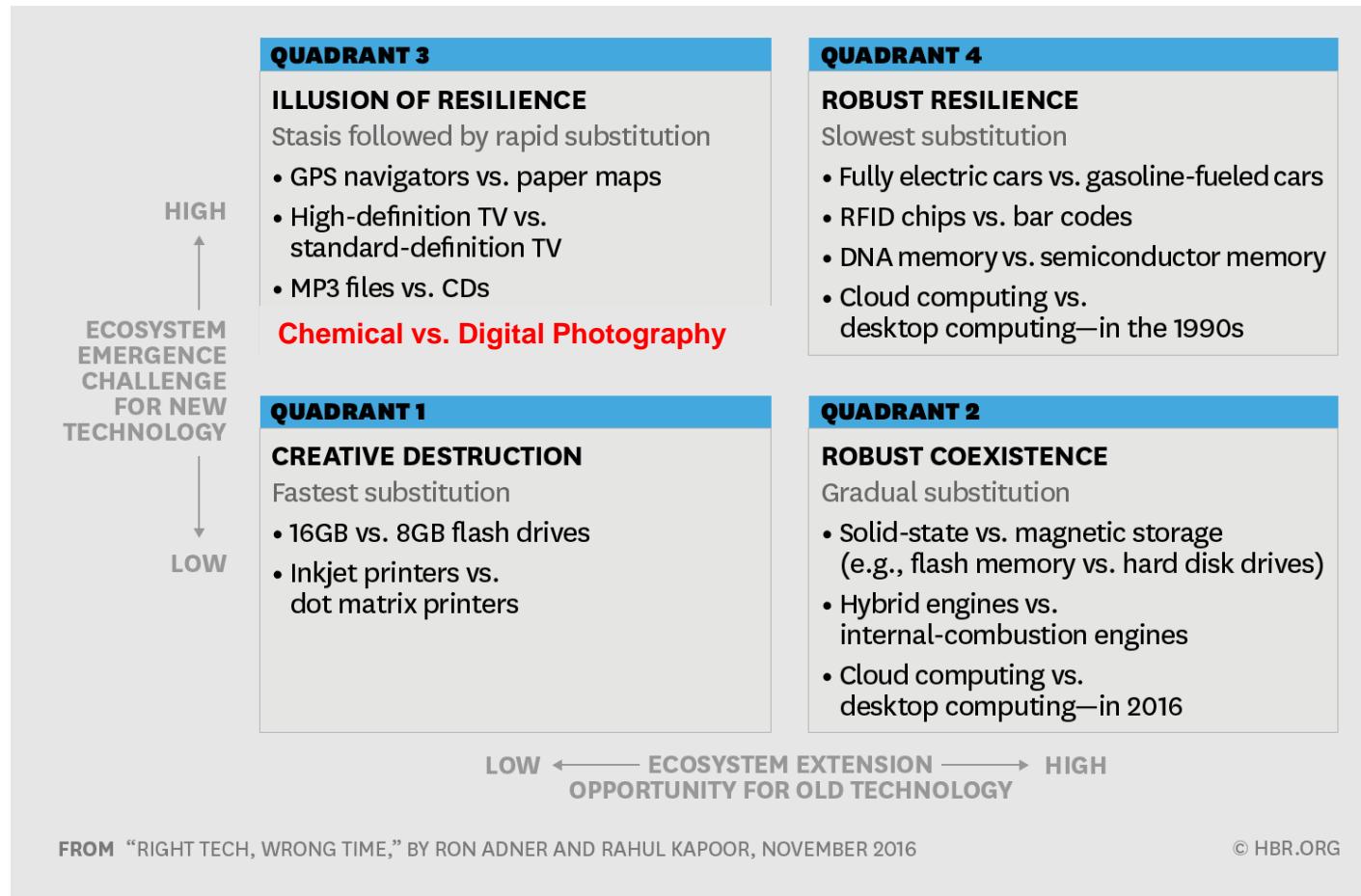


Ecosystem Framework for Evaluating the Pace of Digital Disruption



- Success of any technology is dependent on the ecosystem of components and complements
- Ecosystem Emergence Challenge - During the emergence stage of a technology, the value proposition can be constrained by bottlenecks in components and complements
- Ecosystem Extension Opportunity - During the maturity stage of a technology, the value proposition can be extended by improvements in components and complements

Ecosystem Framework for Evaluating the Temporal Pattern of Digital Disruption



Issue 3: Strategic Adjustment Costs:

(Simultaneous Management of Existing & New Business Models)

Two types of adjustment costs:

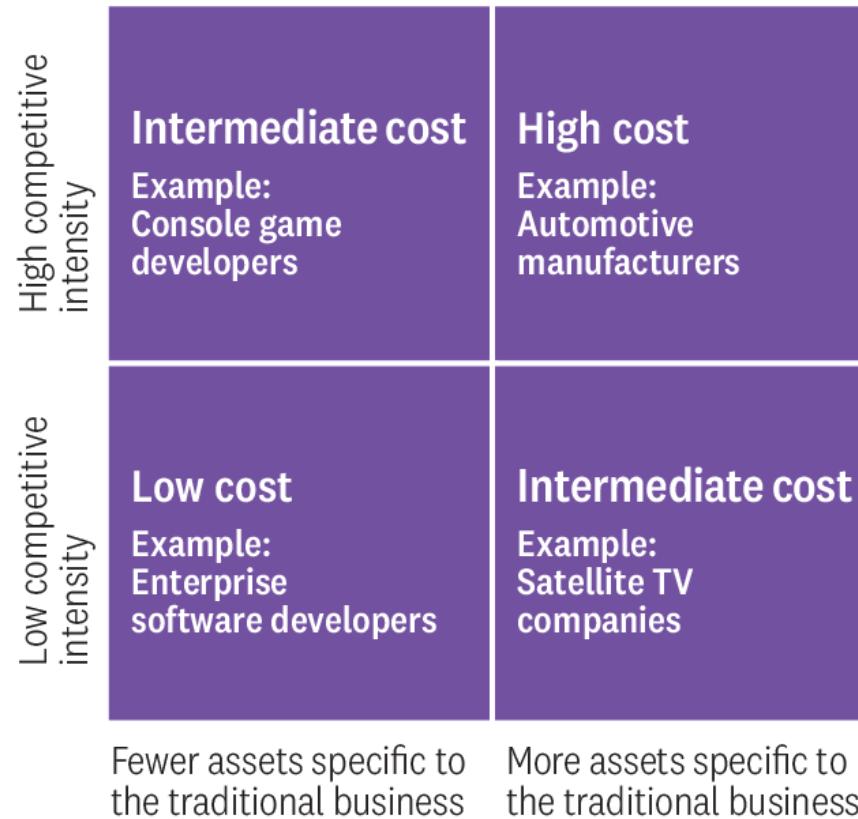
Direct costs – costs of creating new assets and capabilities associated with new business model

Indirect costs – costs associated with internal conflict around cannibalization of the revenues from the existing business or allocation of resources towards the existing and the new business

The higher these costs, the more challenging is the process of strategic adaptation.

Strategic Adjustment Costs:

(Simultaneous Management of Existing & New Business Models)

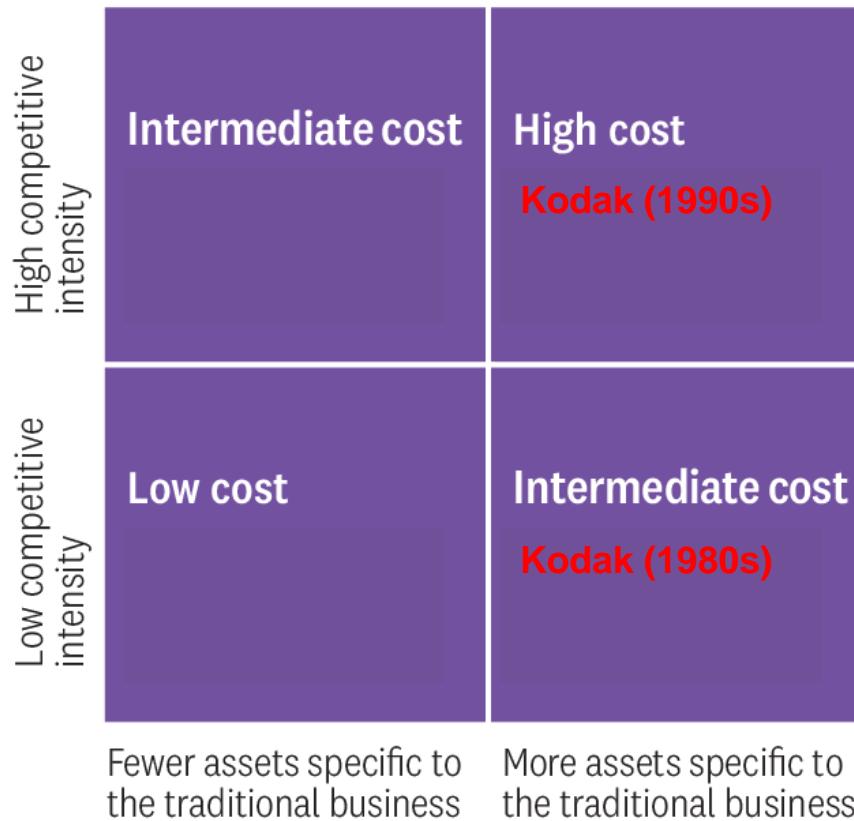


Source: Rahul Kapoor and John Eklund,
based on research of 512 strategic initiatives
at 48 U.S. electric utilities between 2008–2015



Source: Kapoor, R. and Eklund, J. (2018), "Self-Disruption Can Hurt the Companies That Need It the Most," Harvard Business Review

Strategic Adjustment Costs for Kodak



Source: Rahul Kapoor and John Eklund,
based on research of 512 strategic initiatives
at 48 U.S. electric utilities between 2008–2015

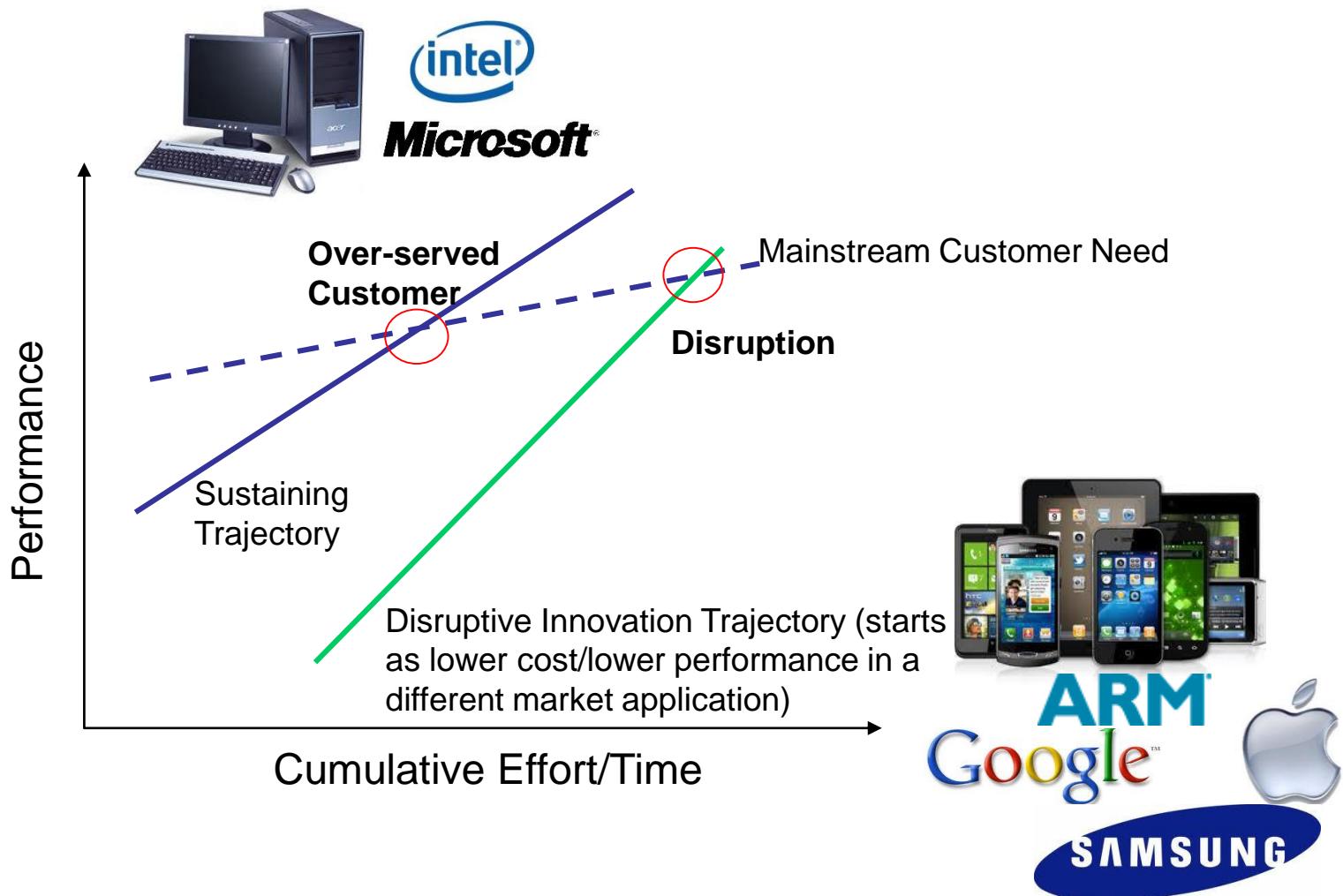


Source: Kapoor, R. and Eklund, J. (2018), "Self-Disruption Can Hurt the Companies That Need It the Most," Harvard Business Review

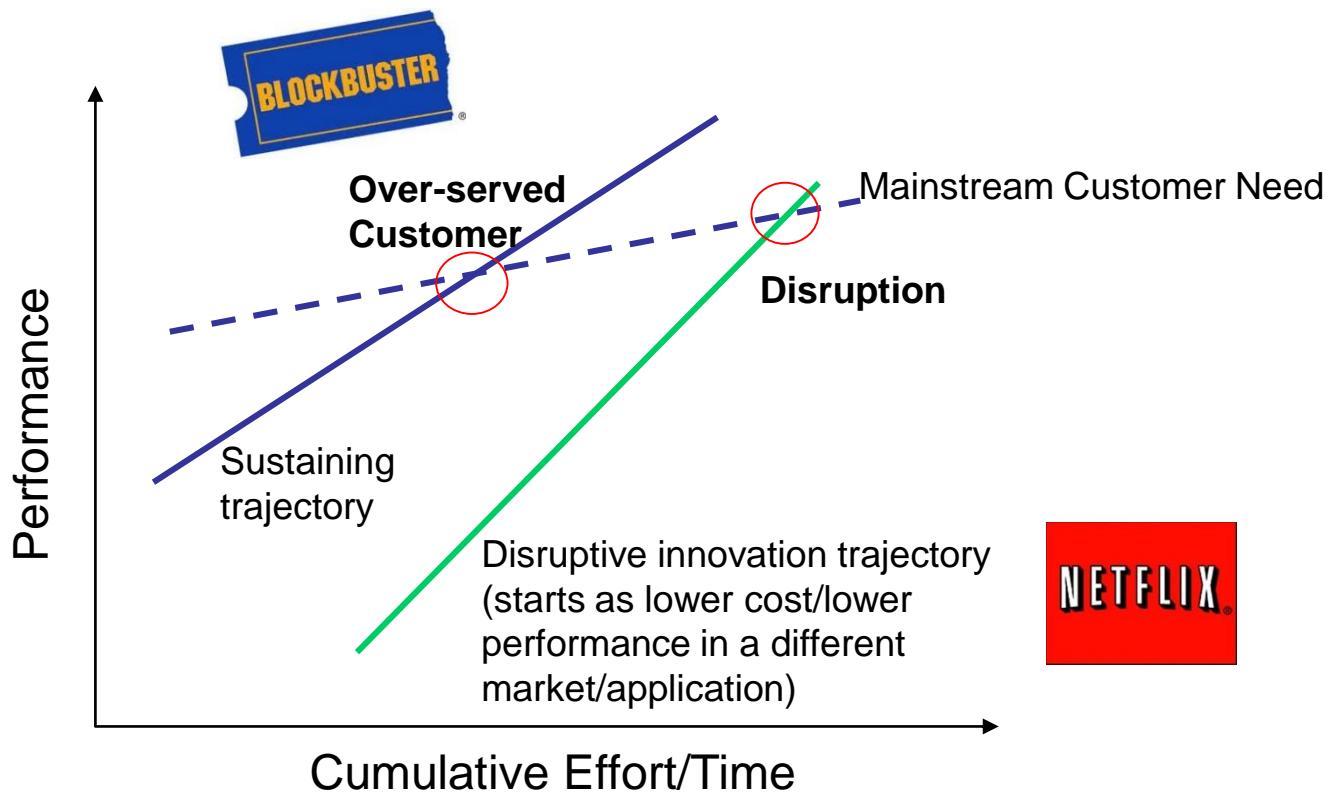
Issue 4: Sustaining vs. Disruptive Innovations

- Sustaining innovations: improve products and services along current dimensions of performance for mainstream customers
- Disruptive innovations: are initially inferior on the historic performance dimensions, but offer a novel mix of attributes that appeal to “fringe” customers (typically low-end or new market segments)

Sustaining vs. Disruptive Innovation Trajectory



The Case of Blockbuster and Netflix



Two Innovation Trajectories with Perception of Digital Photography as Inferior to Chemical Photography



FIGURE 11 PLAYBACK OF PICTURE TAKEN BY ELECTRONIC CAMERA OF TRANSPARENCY SHOWN AT LEFT

Kodak Photo CD Introduced in 1992

Your Photographs On Television. Larger than life. Incredibly sharp. The next generation of memories will be like nothing you've ever seen, thanks to a revolutionary new technology called the KODAK Photo CD System. It puts your favorite pictures on your television.

¶ Amazingly Simple. Take pictures the way you always have, using your current 35 mm camera and film. When you have your film developed, ask the photofinisher to transfer your photos onto a KODAK Photo CD Disc. Play the CD on a special KODAK Photo CD Player. **¶ Brilliant Images.** On your TV screen, you'll see vibrant, high-resolution images. Big, vivid pictures perfect for viewing with family and friends. Pictures you can actually change on-screen—resize, zoom in, and save the changes.

¶ Get Out That Shoe Box. Collect those old photos, slides, and negatives gathering dust in your closet and have your photofinisher create customized Photo CD picture albums. Each CD holds up to 100 pictures, and with the remote control you can view them in any order. It's a convenient, and lasting, way to save your memories. **¶ Sound And Vision.** The KODAK Photo CD Player is also a state-of-the-art audio CD player. That means when the Player isn't playing your pictures, it can play digital stereo sound. **¶ The Future Of Memories.** This next generation of memories will be the biggest, brightest, most unforgettable ever. You've got to see it. Ask your retailer for a demonstration. For the retailer nearest you, call 1-800-945-7200.

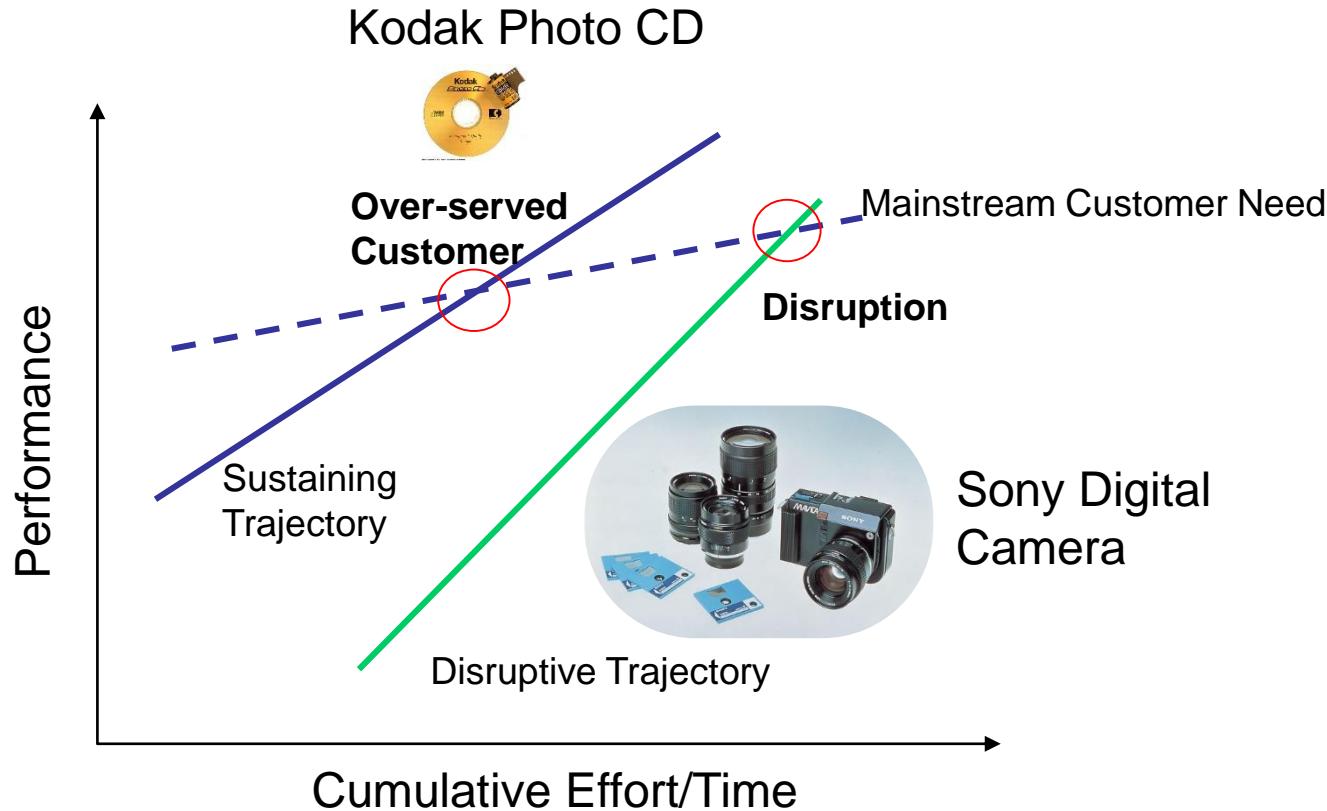
You won't believe the next generation.

Introducing the KODAK Photo CD System.

Your Pictures Have Never Been So Powerful.™

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Sustaining (Photo CD) vs. Disruptive (Digital Camera)



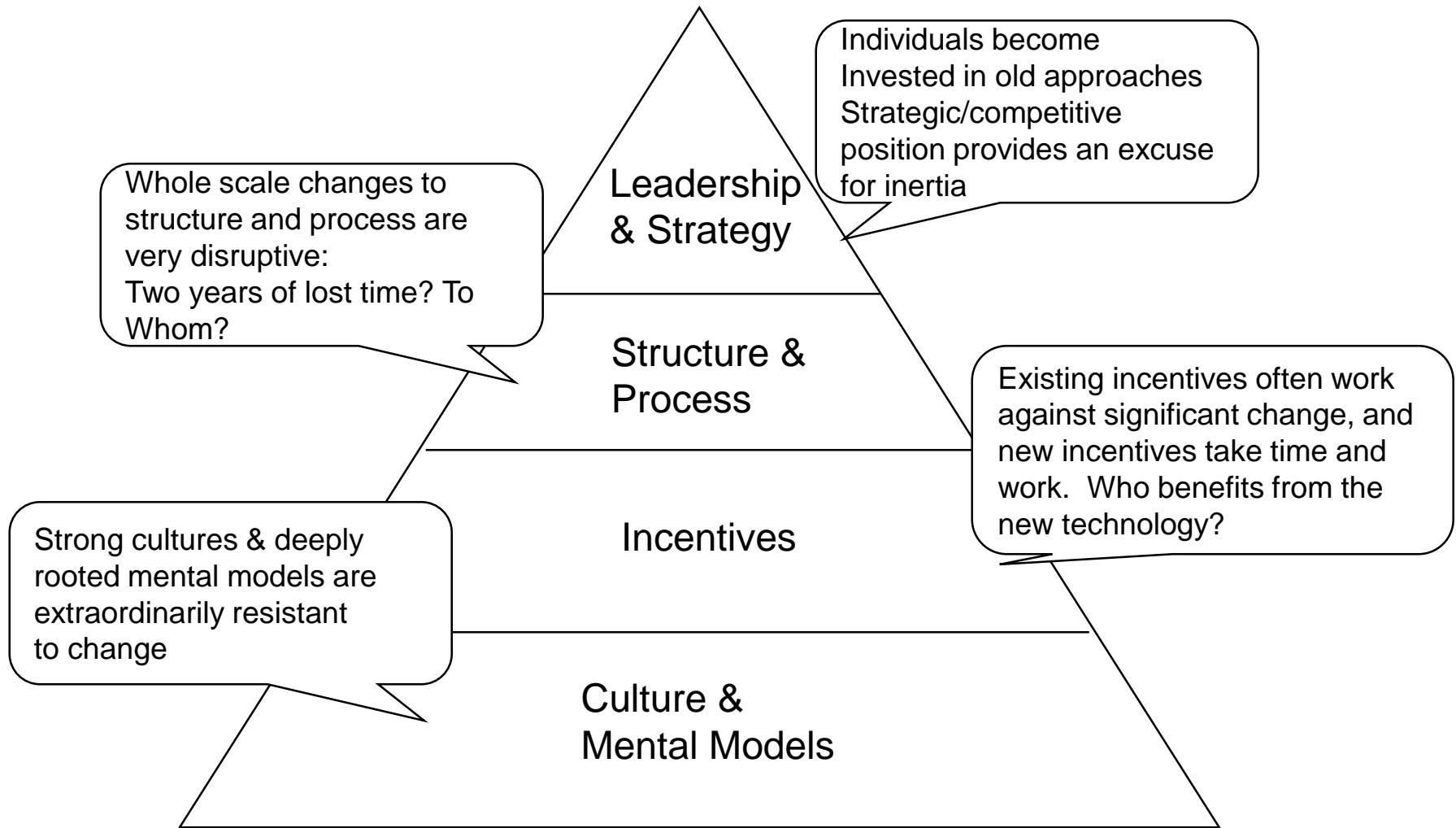
The Sustaining Trajectory and the Problem of Sustainable Value Creation

- Firms can over-serve the market by producing more advanced, feature-rich products than customers need



- Miss the opportunity for pursuing disruptive innovation trajectory early

Issue 5: Organizational Inertia in Established Incumbent



Organizational Design to Manage Change

Exploit Existing Business and Explore New Business

	Exploitative Business	Exploratory Business
Strategic intent	Cost, profit	Innovation, growth
Critical tasks	Operations, efficiency, incremental innovation	Adaptability, new products, breakthrough innovation
Competencies	Operational	Entrepreneurial
Structure	Formal, mechanistic	Adaptive, loose
Controls, rewards	Margins, productivity	Milestones, growth
Culture	Efficiency, low risk, quality, customers	Risk taking, speed, flexibility, experimentation
Leadership role	Authoritative, top down	Visionary, involved

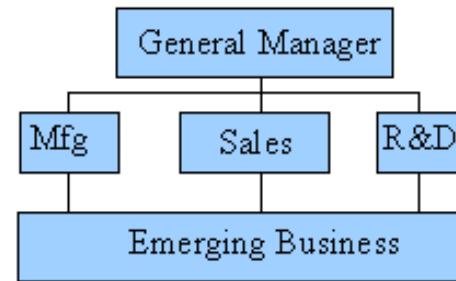
Source: O Reilly, C. A., & Tushman, M. L. (2004). The ambidextrous organization. Harvard business review, 82(4), 74-83.

Types of Organizational Designs

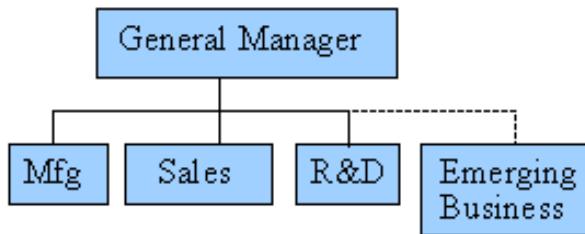
Functional Designs



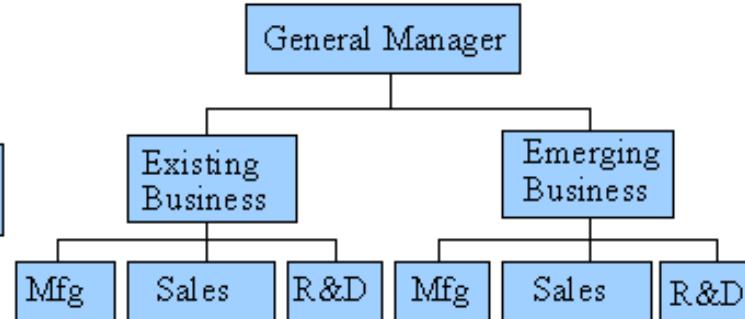
Cross-functional Teams



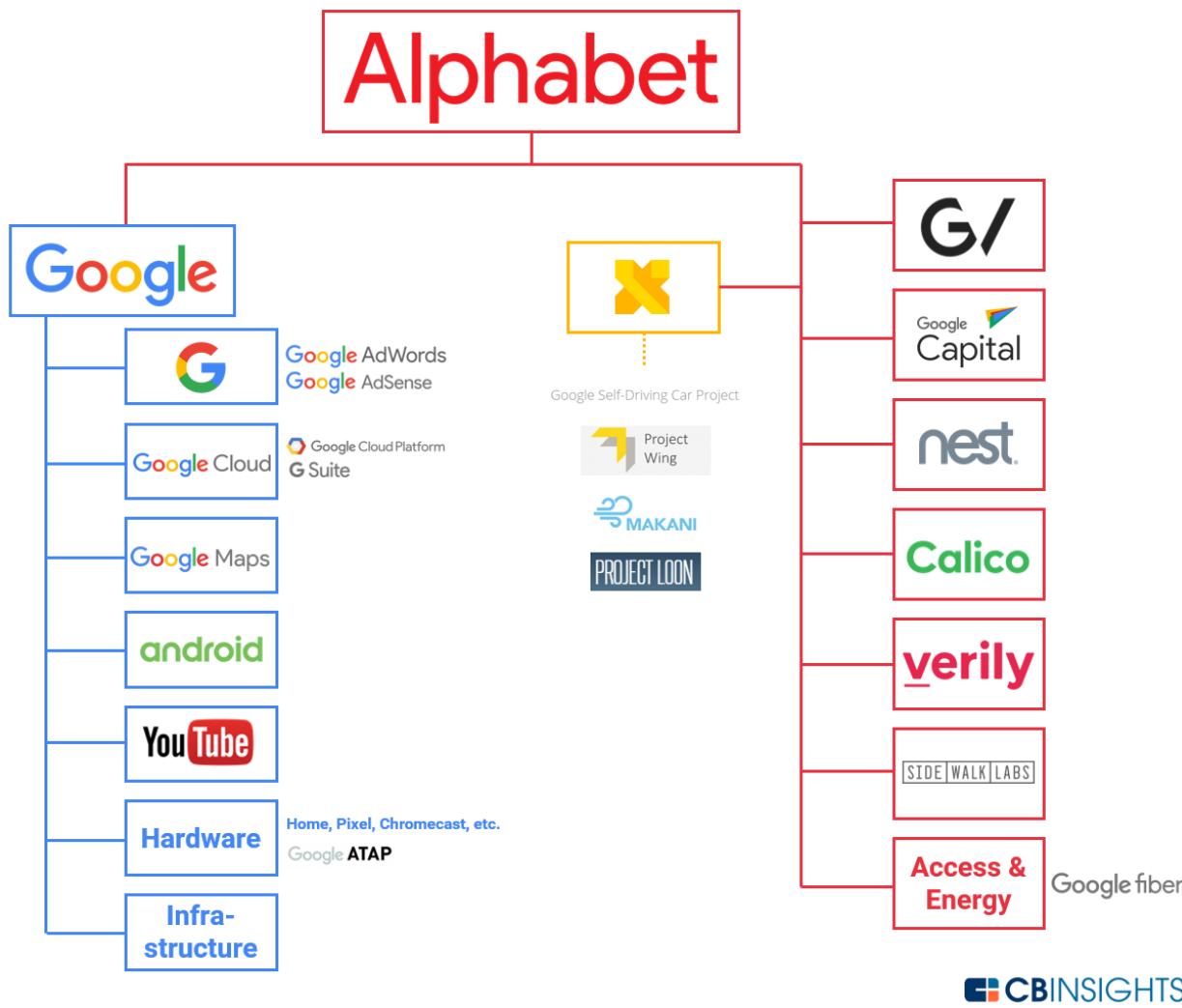
Unsupported Teams



Ambidextrous Organizations



Organizational Ambidexterity at Google



Amazon's Lab126: An Ambidextrous Org Design to Build New Assets

- Hardware division (Bezos' pet project)
- Setup as a fully owned subsidiary in 2004
- Based in Sunnyvale, CA (not Seattle)
- Many employees are ex-Apple employees
- Unlimited resources
- About 800 employees in 2009

Disruption in Pharmaceutical Industry: The Case of Gene Therapy & Monoclonal Antibodies

Joint-research with Thomas Klueter (Wharton PhD)

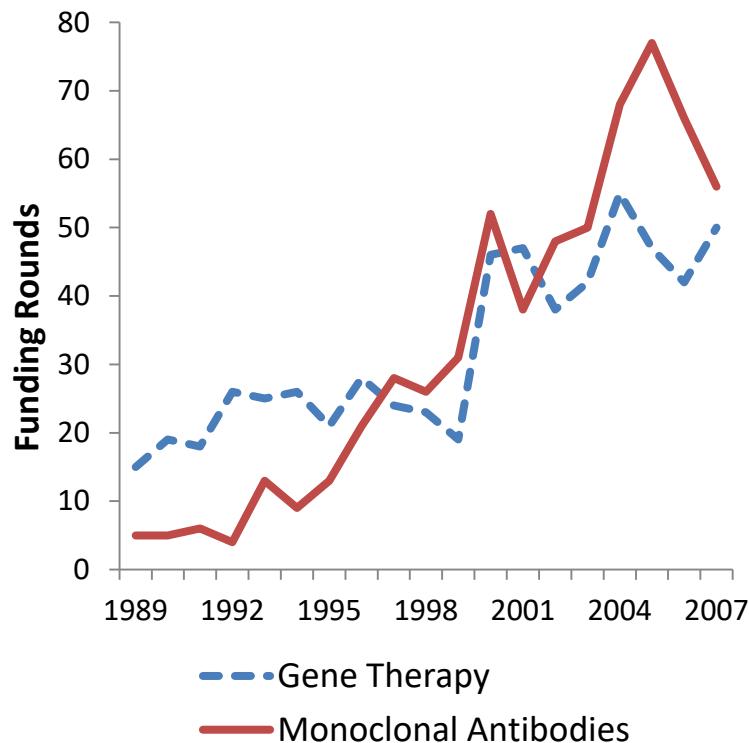
Rahul Kapoor, Thomas Klueter, James M. Wilson (2017), “Challenges in the Gene Therapy Commercial Ecosystem,” *Nature Biotechnology*, 35(9): 813-815.

Rahul Kapoor and Thomas Klueter (2017), “Organizing for New Technologies,” *MIT Sloan Management Review*, 58(2): 85-86.

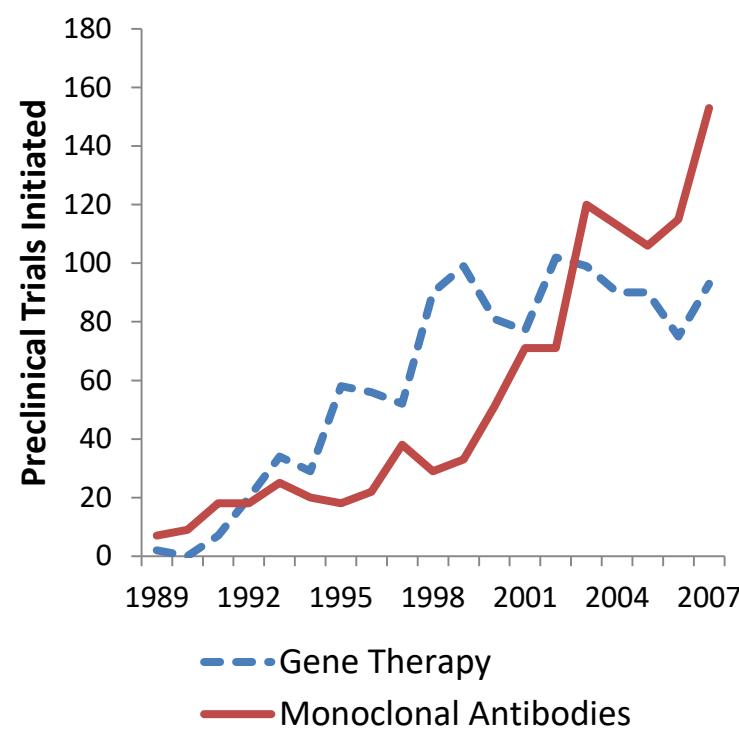
Rahul Kapoor and Thomas Klueter (2015), “Decoding the Adaptability-Rigidity Puzzle: Evidence from Pharmaceutical Incumbents’ Pursuit of Gene Therapy and Monoclonal Antibodies,” *Academy of Management Journal*, 58(4): 1180-1207.

Two Technologies Emerging at the Same Time

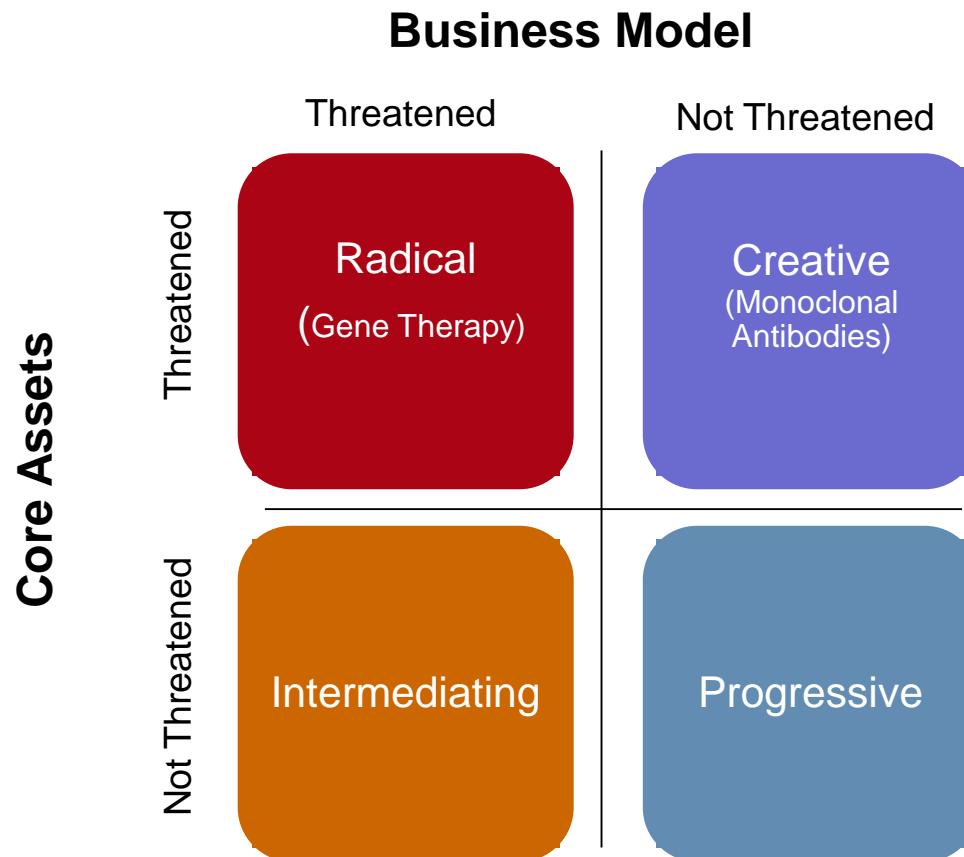
Funding Activity



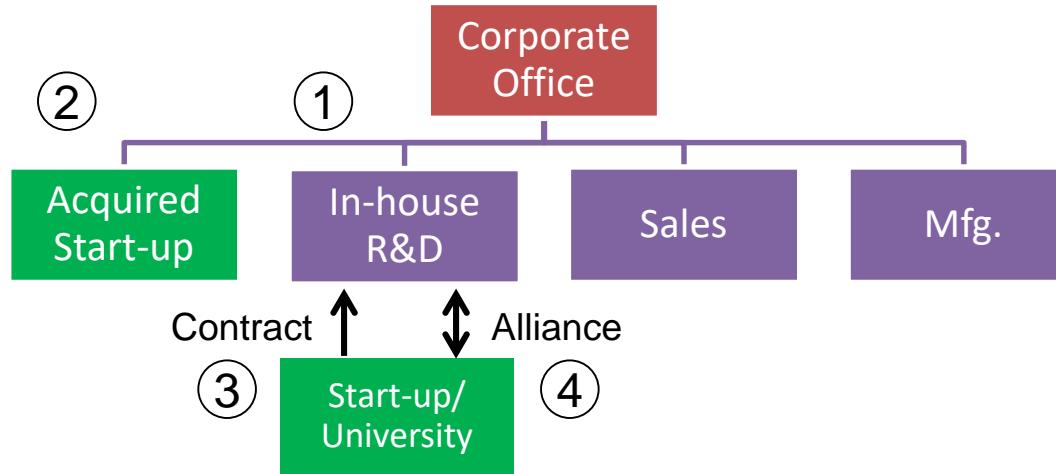
Development Activity



Different Flavors of Disruption



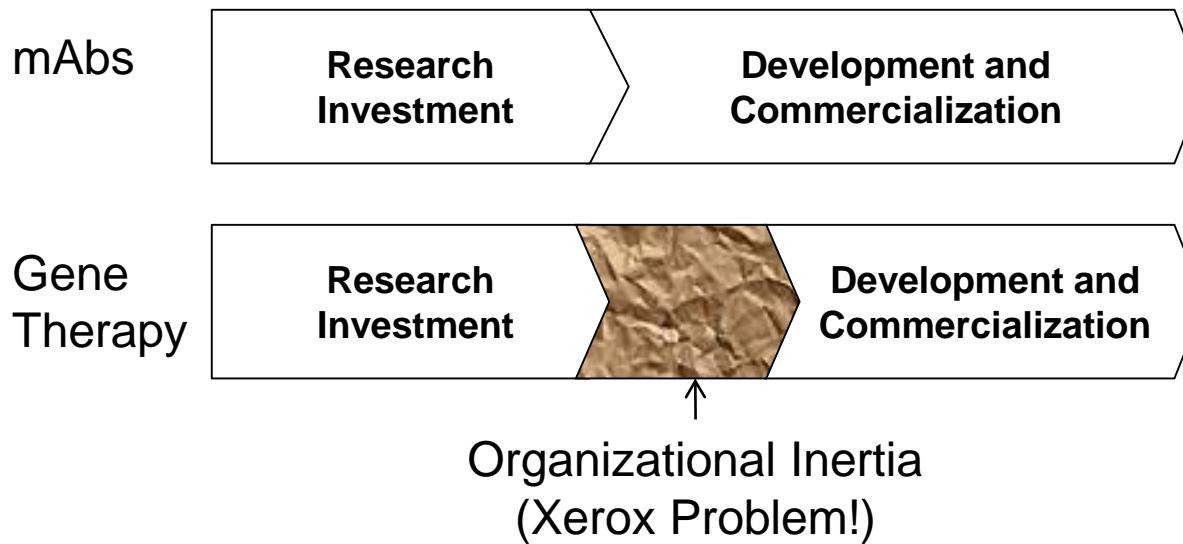
Established Pharmaceutical Firms Pursued mAbs and GT via Four Different Modes



Each mode represents a unique combination of:

- Who does the research (in-house research unit, acquired research unit, contracted research unit, joint research team)
- Who is involved in the decision for subsequent product development (established incumbents, alliance partners, acquired start-ups)

In-house and Contract Research



"Compared to mAbs...gene therapy is driven by personal health and niche applications...for a small set of patients, you will command a very high price...the business case [for GT] is hard to establish."

"Contract research and in-house research are both managed by the [incumbent] organization so there is no real difference regarding the commercialization decisions."

Organizational Ambidexterity Via Strategic Alliances

"Disruptive innovations are better managed through collaboration between Big Pharma companies and universities or start-ups because of sharing of risks and knowledge as well as collective decision making."

"Collaboration in research has an external partner whereas contract research has an external contractor. This is a major difference regarding who drives the research agenda and how critical decisions regarding the research are being made."

Organizational Ambidexterity Via Start-up Acquisitions (Managed as Emerging Autonomous Units)

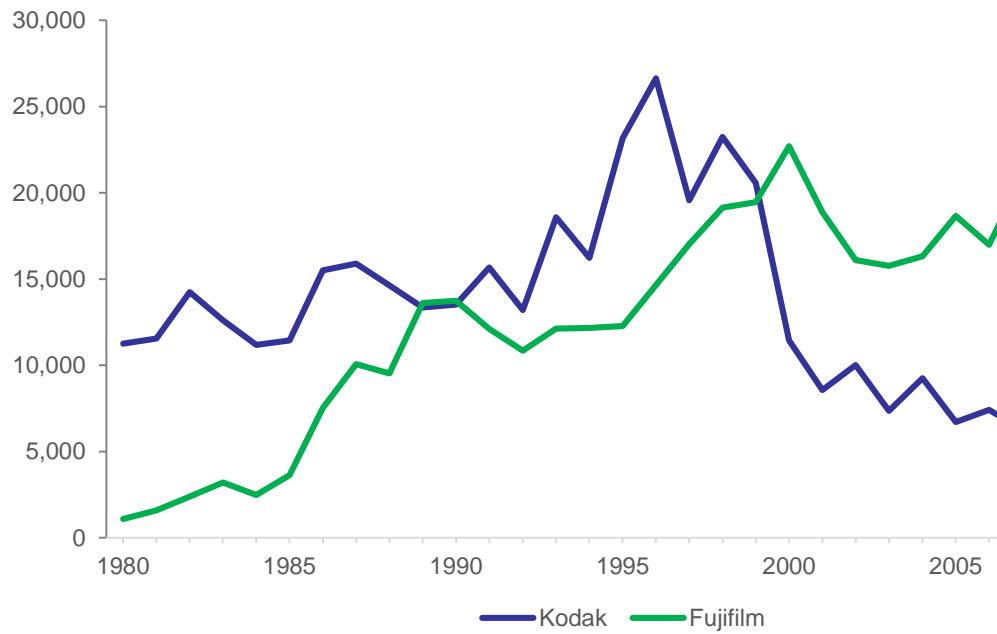
"We try to have a very much hands-off approach as we want to learn from the acquired entities."

"While firms get integrated, the acquirer always tries to retain and incentivize key scientists and decision makers of the acquired firm to be part of the decision-making as you cannot afford to lose them."

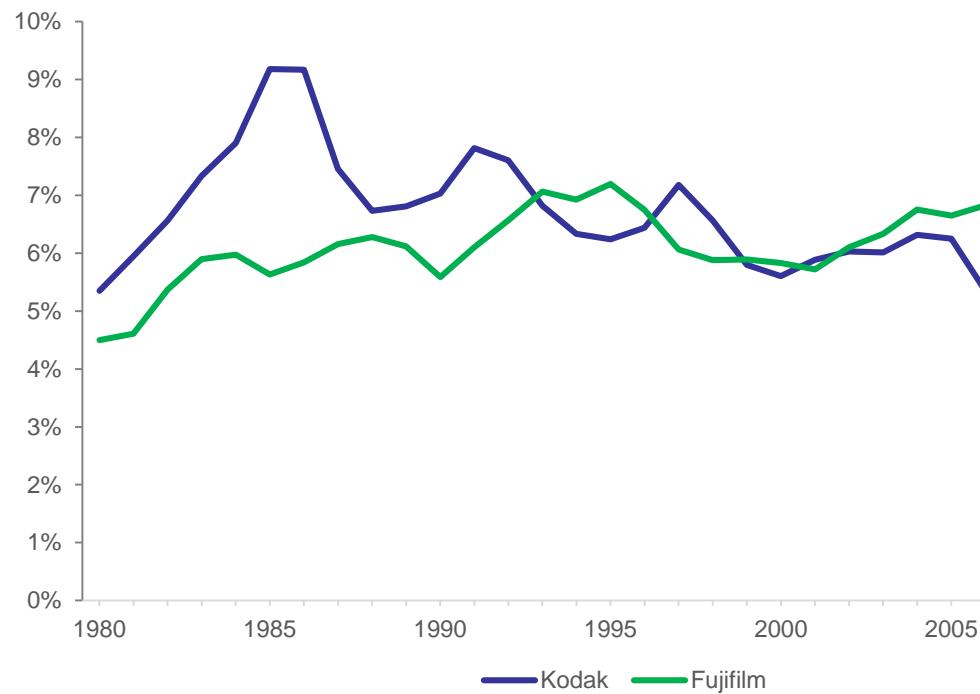
In Summary: Kodak's Pursuit of Digital Transformation

- Extension of its chemical photography business model (Creative Change/Sustaining Innovation)
It was a radical change and entailed a disruptive innovation approach
- Uncertainty over whether and how digital photography can supplant the performance and profitability of chemical photography
Film photography remained dominant for almost two decades; Digital photography was unprofitable and entailed significant adjustment costs
- Existing organizational design
It required an ambidextrous organizational design that can both explore new business opportunities and exploit the existing business in a disciplined manner
- Kodak leadership struggled to embrace a disciplined and consistent approach to digital transformation premised on new capabilities and business models

Market Capitalizations of Kodak and Fujifilm (US\$M)



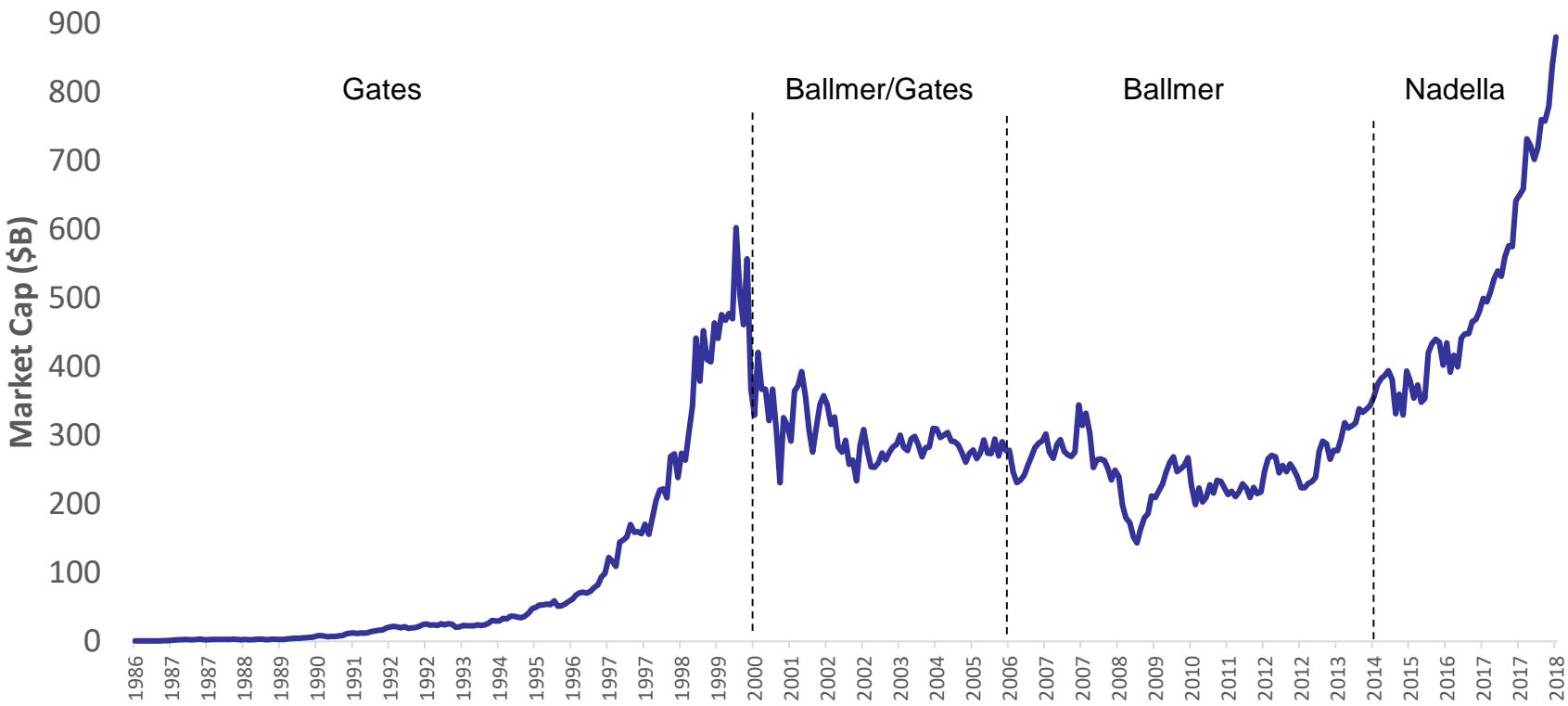
Kodak and Fujifilm R&D as % of Sales



Fujifilm During the 1980s and 1990s

- Gradually increased its market share by innovating in film photography and lowering price during the 1980s and 1990s
- Managed for a radical change by launching “digital only” products
- Experimentation with many fields - health care imaging, graphic systems, highly functional materials, optical devices, office documents.
- In-house capability development in digital, acquisitions and alliances to access external digital capabilities (FujiXerox)
- Much more diversified corporation than Kodak premised on both supply-side and demand-side synergies over time

Microsoft: From Digital Disruption to Digital Transformation





Microsoft

Breakout Exercise (15 mins)

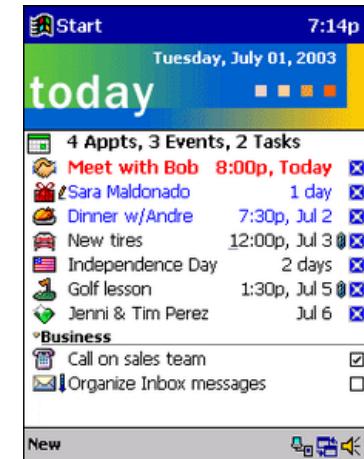
Why did Microsoft fail to capitalize on digital opportunities from mobile technologies?

What are the most significant transformation efforts that Nadella has pursued since taking over as CEO of Microsoft?

Microsoft's Hits and Misses

Year	Product / Service	Business Model	Results
1996	Windows CE in third-party PDAs	Software	- Overshadowed by PalmPilot
2000	Tablet PC (leveraging Windows XP)	Software	- "Cumbersome" - Ignored by general public and enterprise users - Launched during dotcom bubble burst - Did not reach critical mass
2001	Xbox	Hardware + Software	- Late entrant, not a big hit
2003	Windows Mobile OS	Software	- initially successful (tightly integrated, found niche in enterprise) but cost too high for manufacturers
2005	Xbox 360	Hardware + Software	- 80mn units sold - Successful due to competitive pricing, ease of development, and compatibility, subscription model - Led to Entertainment and Devices Division contributing \$2Bn revenue
2006	Zune	Hardware + Software	- late to market
2006	UMPC	Hardware + Software	- Unpopular, proving Windows unable to transition to more mobile platform
2011	Windows Phone	Hardware + Software	- Discontinued, beaten by Android
2011	Windows RT	Software	- Compatibility issues - \$800Mn writeoff

Pursuing Mobile as Sustaining Innovation

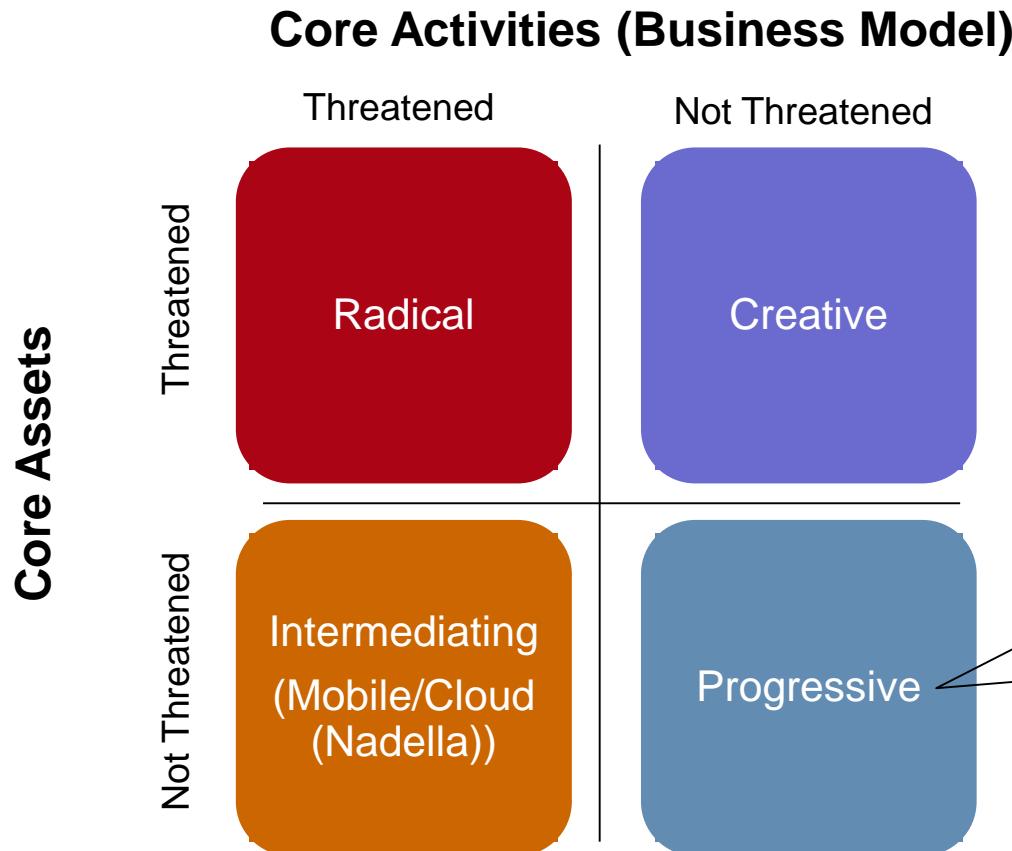




Satya Effect

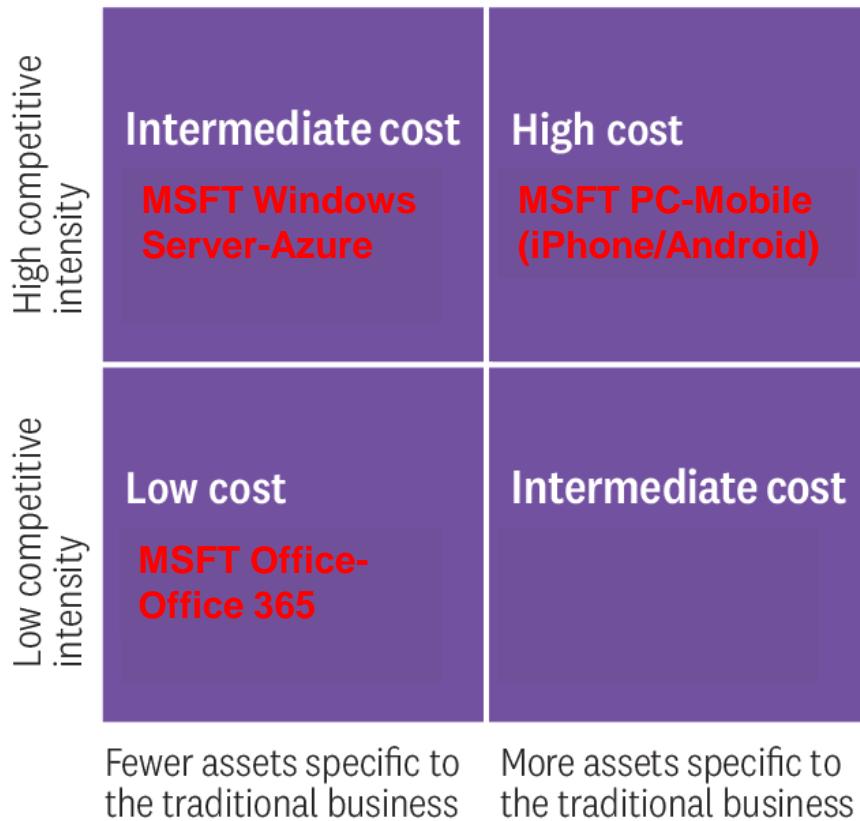
- Business Model – Windows → Cloud
- Organization – Competition → Collaboration

Strategy and Flavors of Disruption



Microsoft's
Perception of
Mobile/Cloud
(Ballmer)

Strategic Adjustment Costs

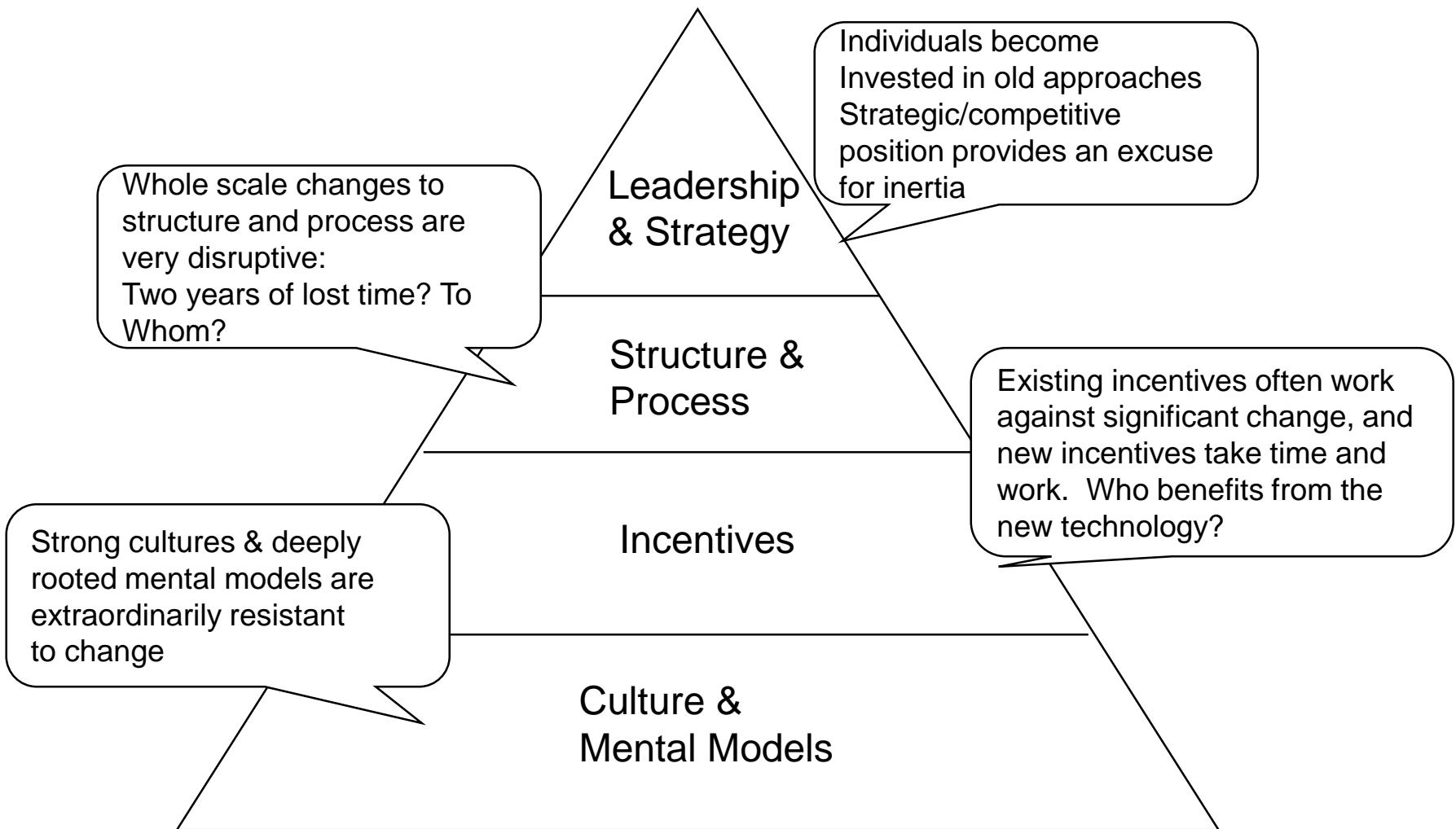


Source: Rahul Kapoor and John Eklund,
based on research of 512 strategic initiatives
at 48 U.S. electric utilities between 2008–2015

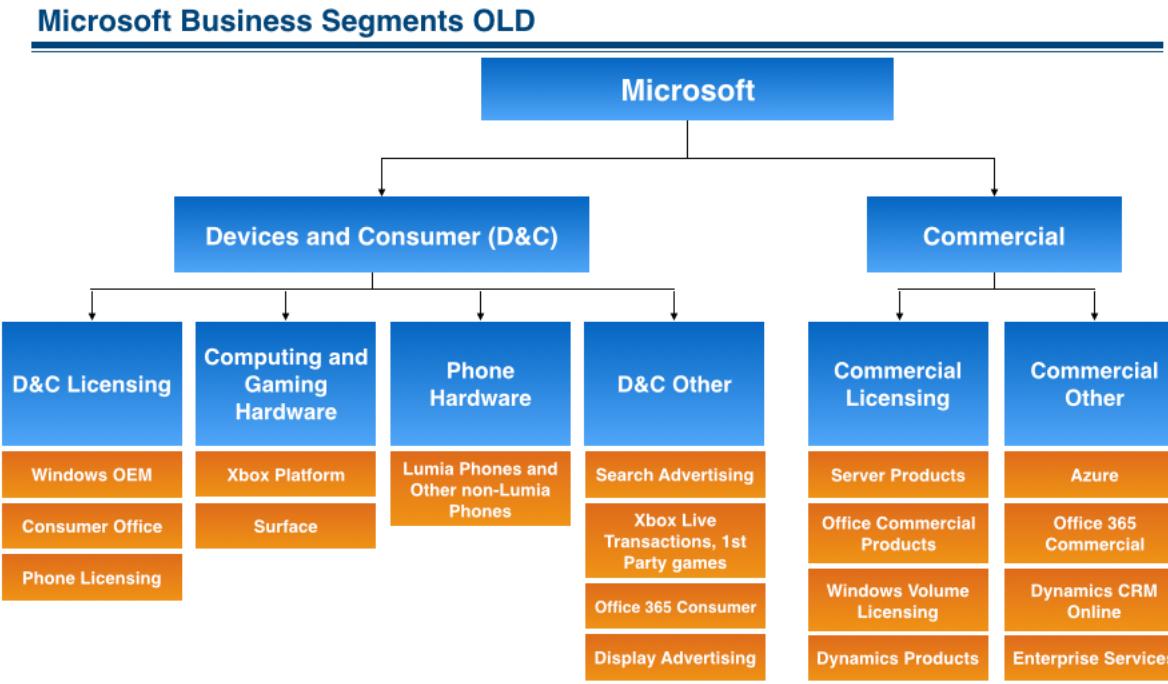


Source: Kapoor, R. and Eklund, J. (2018), "Self-Disruption Can Hurt the Companies That Need It the Most," Harvard Business Review

Organizational Inertia in Established Incumbent

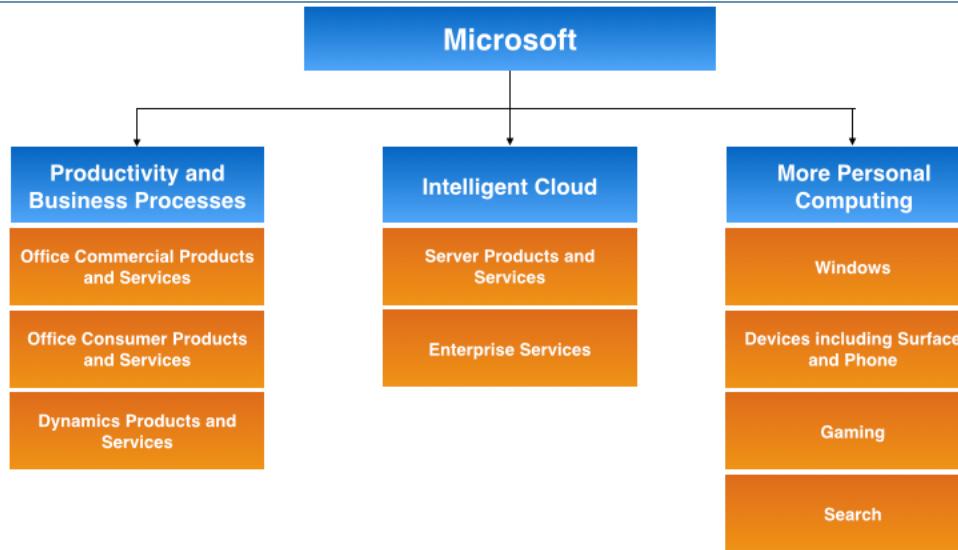


Microsoft Organization (Pre-Nadella)



Microsoft Organization (Nadella)

Microsoft Business Segments NEW - Simplified View



Microsoft Revenue by Division

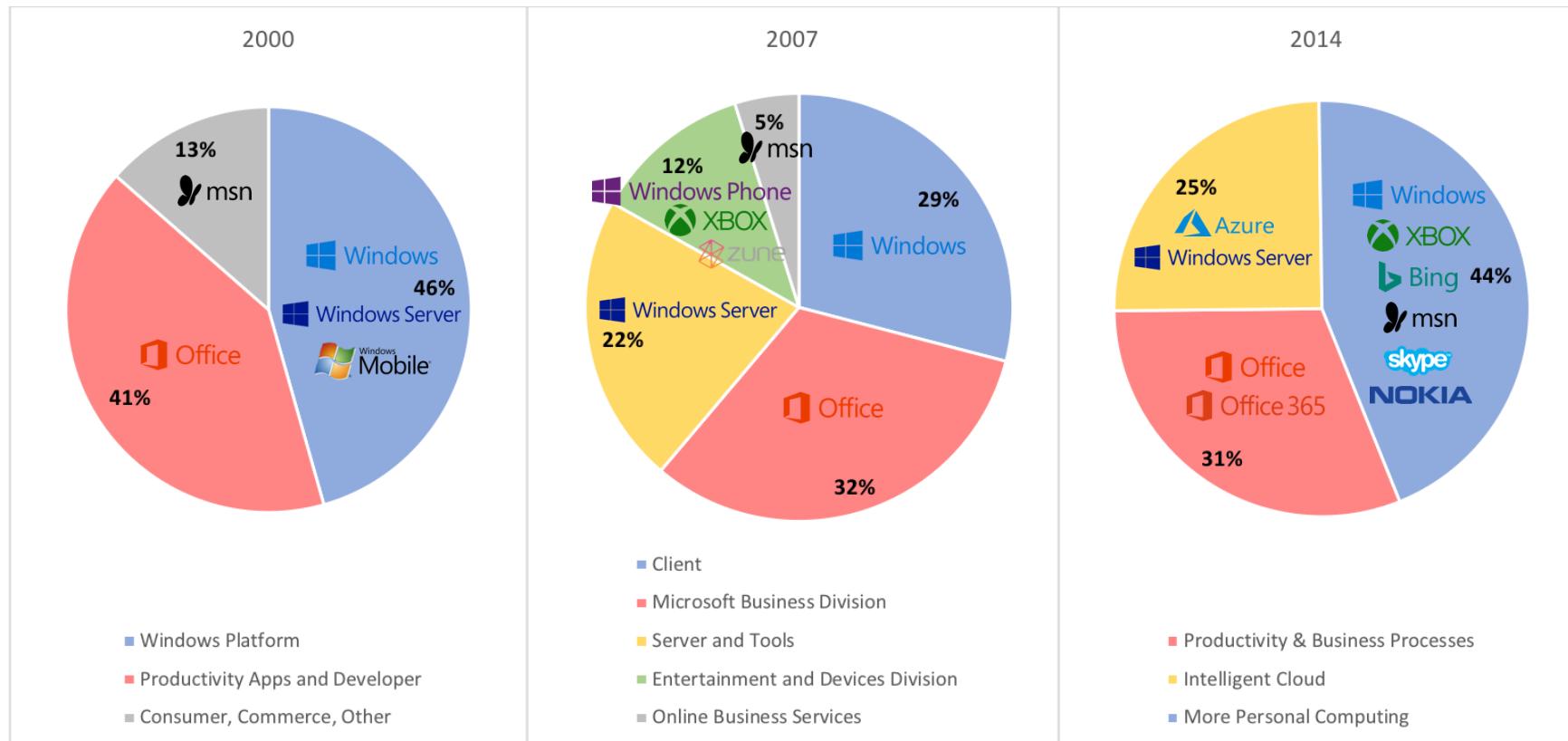


Exhibit 2: Microsoft Revenue / Number of Employees by Year

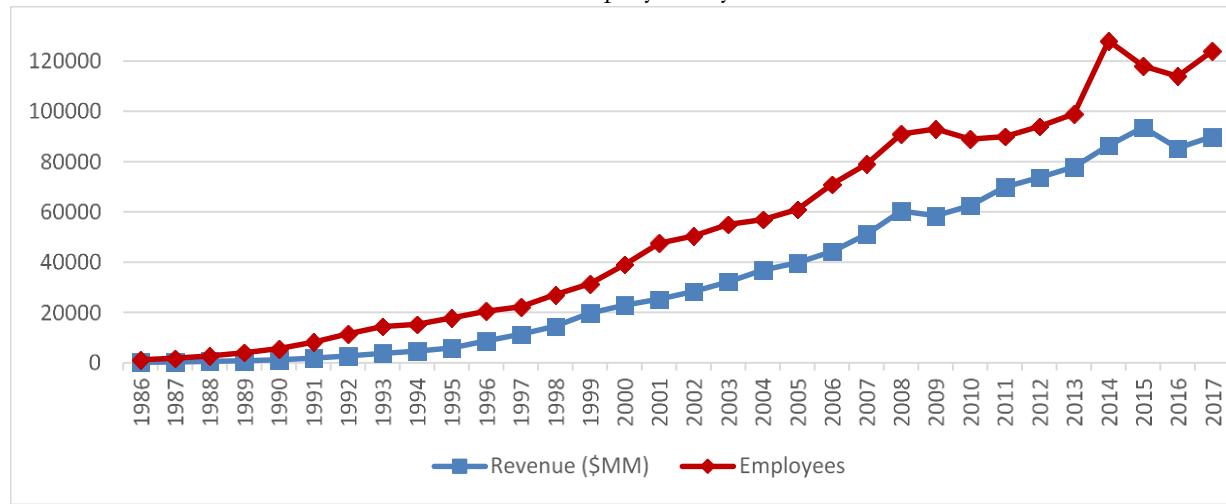
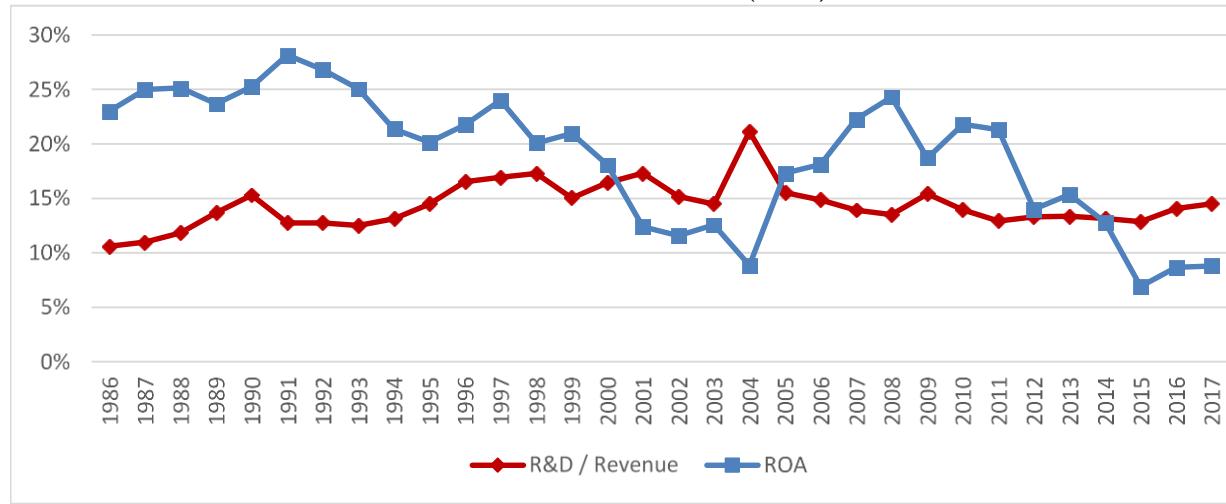


Exhibit 3: Microsoft R&D/Revenue and Return on Assets (ROA)

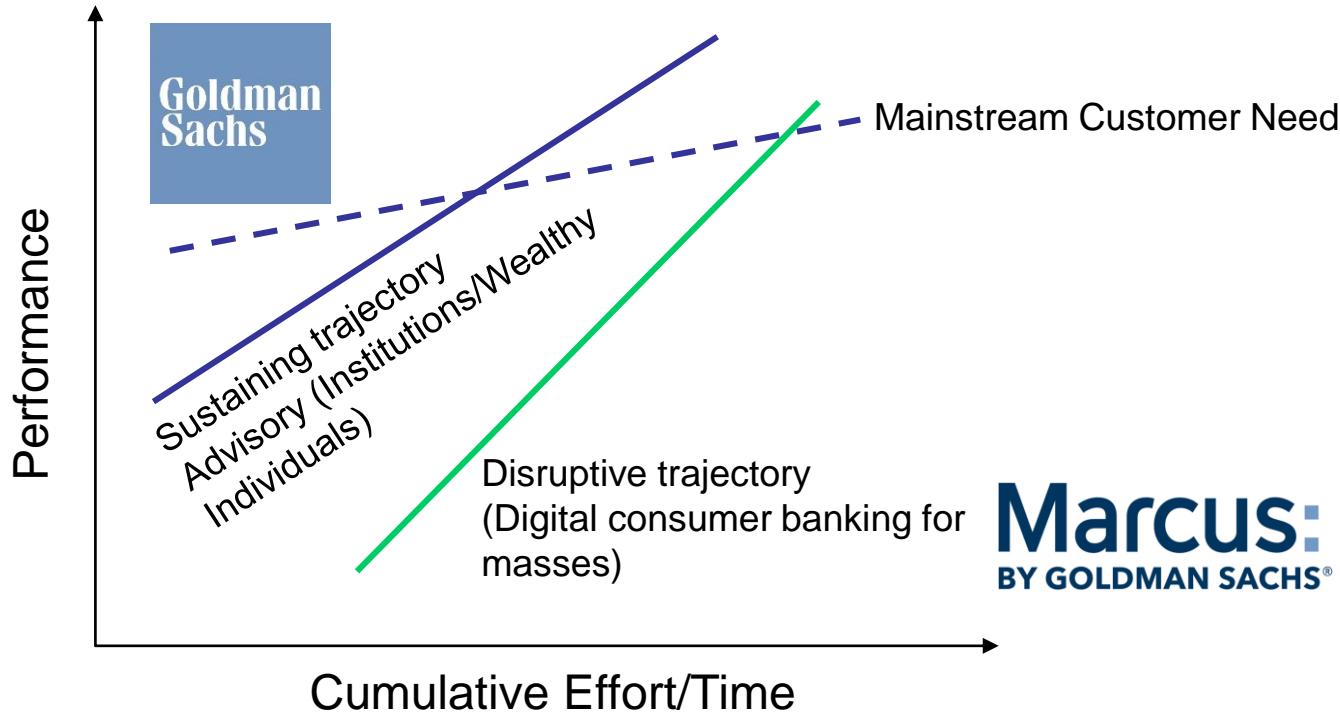


Digital Transformation at Goldman Sachs: 150-year-old B2B investment bank → digital consumer banking

The image illustrates the digital transformation of Goldman Sachs through its subsidiary, Marcus by Goldman Sachs. It features three main components:

- Top Panel:** A blue graphic showing the transition from "Goldman Sachs" to "Marcus: by Goldman Sachs".
- Middle Section:** The Marcus by Goldman Sachs website homepage. The header includes navigation links for Savings, Investments, Loans, Credit Cards, Tools & Resources, and a Log In button. The main headline reads "Boost your savings with a Marcus Online Savings Account" and highlights a 1.90% APY. To the right is a graphic of four stacks of coins, each topped with a small green plant, symbolizing growth. Below the headline, a list of benefits includes: "Earn a rate that's 4x the national average.", "Backed by the financial expertise of Goldman Sachs.", "No Fees. No Minimum Deposit.", "Same-day transfers of \$100,000 or less to/from other banks.", and "Contact Center available 24 hours a day / 7 days a week." Buttons for "Open an Account" and download links for the App Store and Google Play are also present.
- Bottom Section:** A mobile phone displaying the Marcus app interface, which shows various account details and a graph. To the right, text encourages users to "Get fast, easy mobile access with the Marcus app" and lists features such as scheduling transfers, reviewing transactions, tracking interest earned, and using Marcus Insights tools. A "Open an account" button is located at the bottom of this section.

The Case of Goldman Sachs and Marcus



Marcus Timeline

- 2014 - Decision to pursue consumer banking at leadership retreat
- 2014-16 – Built a separate ambidextrous organization

External hires from consumer financial services + fintech

Selective internal hires to support new business and stay integrated with the parent and benefit from synergies)

- 2016-17 – Market launch of Marcus (loans, deposits, savings)

Social media marketing

Acquired GE Online (\$8.7B in deposits)

\$2B Loan origination

- 2017-18 – Growth

Acquired Clarity money personal finance app

Expanded into UK; Partnership with Apple Card

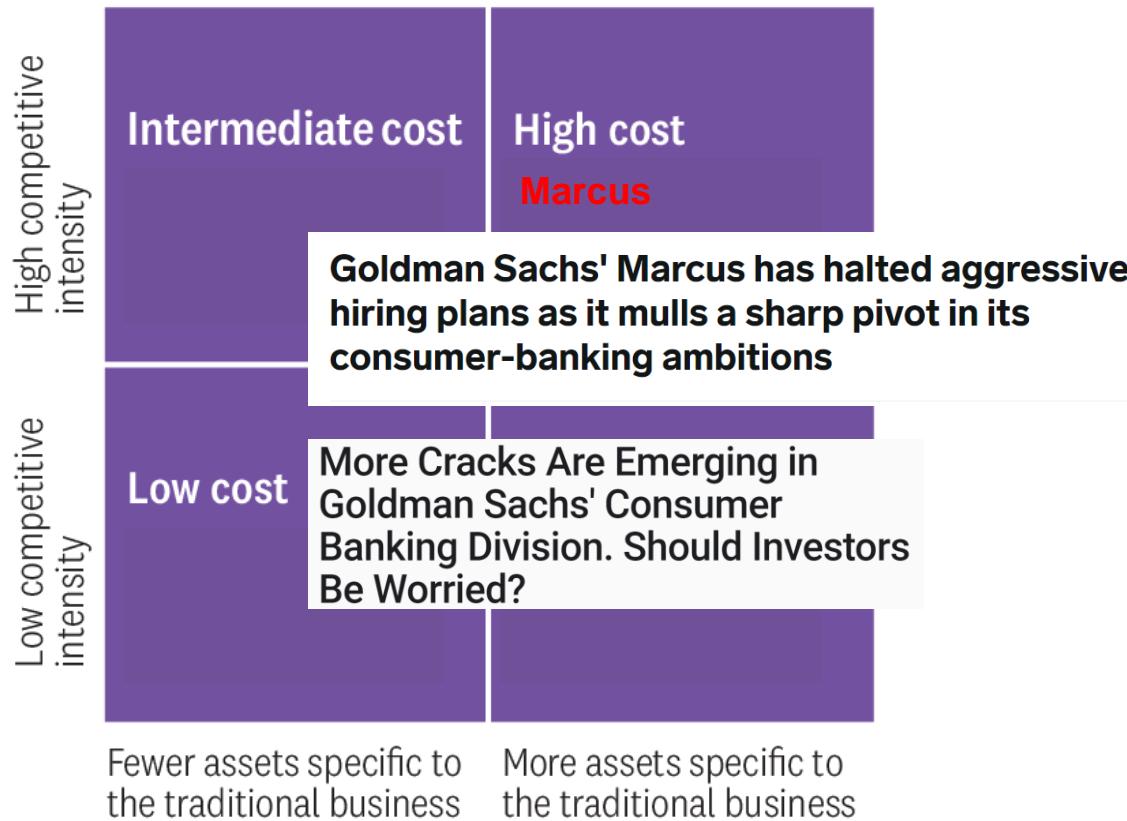
1.5M customers, \$3B+ Loan origination, \$20bn+ deposits

Announced revenue target of \$1B in 2020 (No more exploration!)

2022 Update

- Marcus is set to post cumulative losses topping \$4 billion since inception
- Considering delaying the launch of online checking accounts (very high customer acquisition cost)
- Considering pivot to more wealth management and less to consumer banking

Strategic Adjustment Costs for Goldman

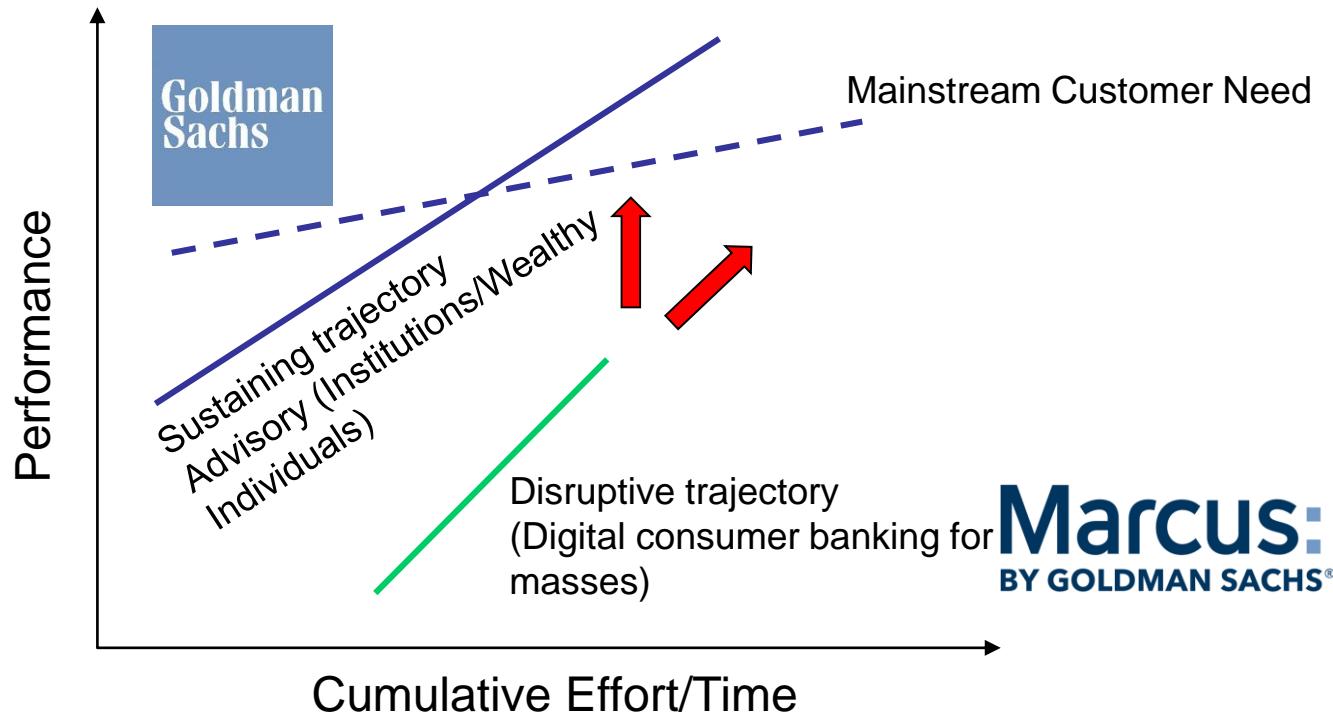


Source: Rahul Kapoor and John Eklund,
based on research of 512 strategic initiatives
at 48 U.S. electric utilities between 2008–2015



Source: Kapoor, R. and Eklund, J. (2018), "Self-Disruption Can Hurt the Companies That Need It the Most," Harvard Business Review

Marcus at Crossroads (Similar to Fisher Era at Kodak)



The Case of Successful Digital Transformation at DBS



- 3X increase in Market Value from 2009 (\$20B) to 2020 (\$60B)
- *Euromoney*, World's Best Digital Bank (2016, 2018)
- *Global Finance*, Best Bank in the World in 2018
- *Innosight*, named DBS Bank in 2019 among top 20 global companies that had achieved the highest impact business transformation over the past decade (list that includes Fujifilm and Microsoft)

Transformation Triggers: Response to Threat by Technology Disruptors

Incumbent Banks



Fintech Start-ups



Tech Platforms



Disruption Landscape: Strengths and Weaknesses

	Incumbent Banks	Fintech Start-ups	Tech Platforms
Strengths	<ul style="list-style-type: none"> • Brand equity • Customer base • Financial resources • Regulatory expertise 	<ul style="list-style-type: none"> • Technical capabilities to optimize customer journeys • Disruption mindset 	<ul style="list-style-type: none"> • Technical capabilities to optimize customer journeys • Brand equity • Platform ecosystem • Financial resources
Weaknesses	Organizational inertia IT infrastructure/legacy	Lack of brand equity Limited regulatory expertise Limited resources	Antitrust constraints Limited industry expertise



Leadership of Piyush Gupta (DBS CEO)

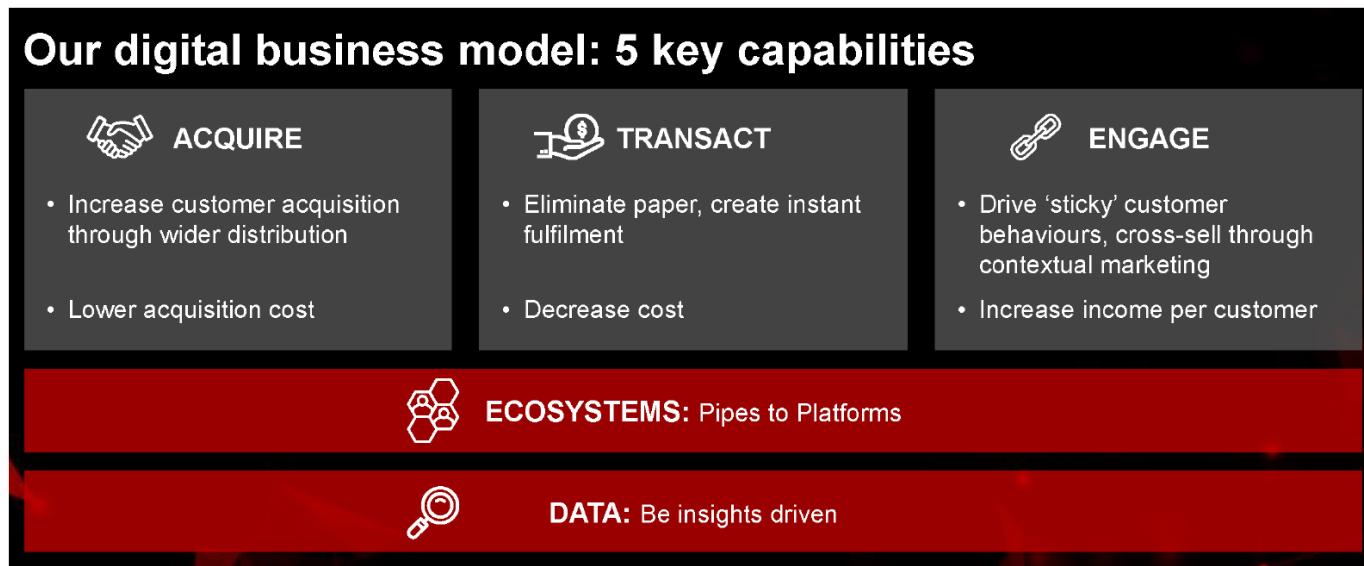


“I have to confess: it’s not always clear that you can predict the future. But it is clear that you must have a point of view on the future. You want to make sure that you have thought about it enough such that you have enough ideas to be able to be adaptive and to be responsive”

Source: Sia, Weill and Zhang (California Management Review, 2021)

Transformation Goals

- “Rewire” the entire enterprise for digital innovation.
- Leverage technology to “Make Banking Joyful”
- “Live more, Bank less,” its latest manifesto, captured this new vision of simple, effortless banking for its customers.



Source: Sia, Weill and Zhang (California Management Review, 2021)

Creating a 26,000 Employee Start-up!

What makes a 26,000 start-up?

- Customer Obsessed**
- Data-Driven**
- Take Risk & Experiment**
- Agile**
- Be a Learning Organisation**

DBS Digital Transformation Process (2009-2019)

- 2009-2014 – Tightening IT Alignment with Business

Merged technology and operations into Technology and Operations (T&O) division

Customer experience and innovation function as part of T&O

Upgraded and aligned IT architecture to create a back-end technology platform to support diverse range of applications

- 2015-2019 – Embracing Organizational Ambidexterity

Modernized core operational backbone and building new digital services platform offering more than 150 APIs for external partners

Moved from 85% IT outsourcing to 85% insourcing

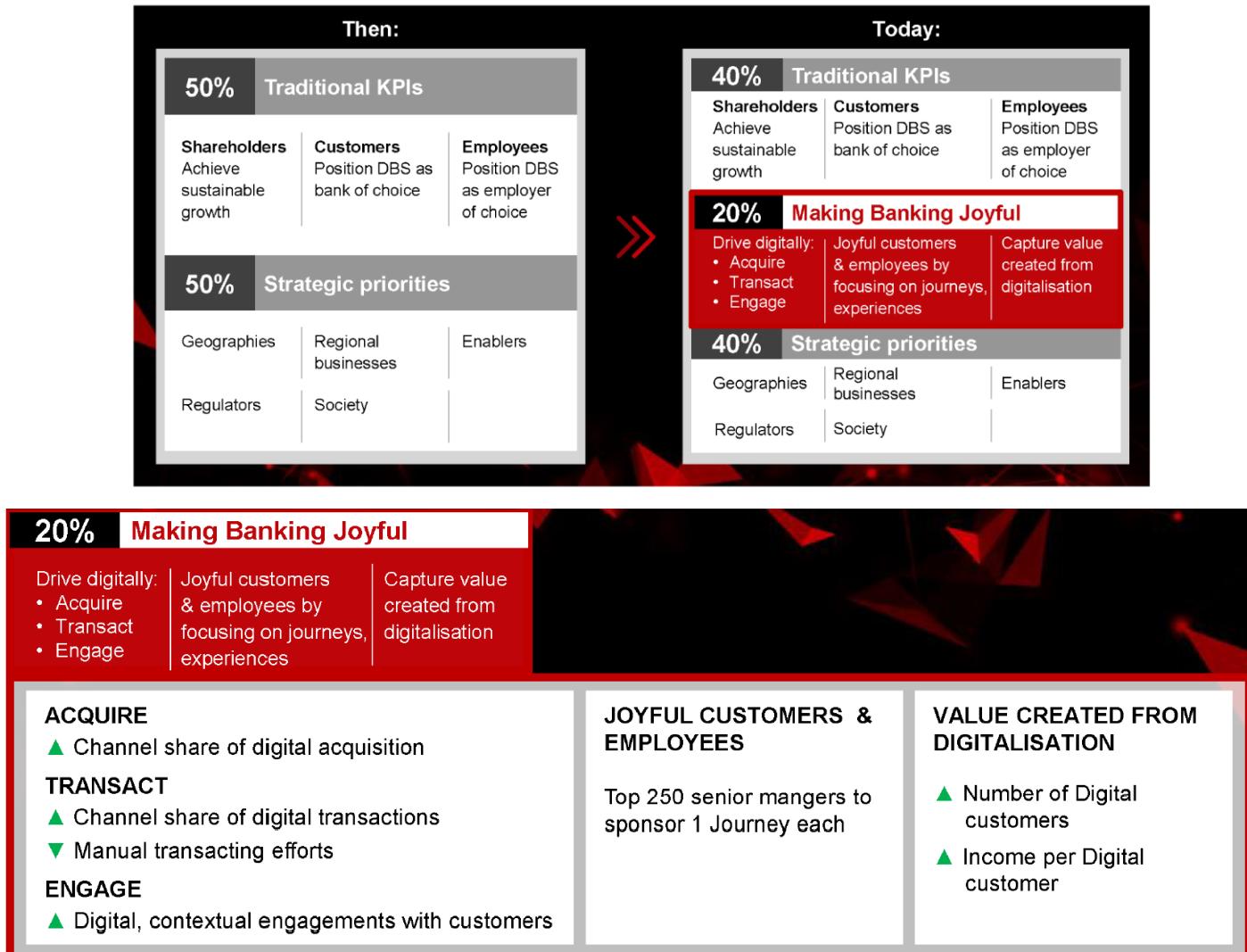
Launch of digibank in India and exploring several emarketplaces

Partnership with P2P lending start-ups

Customer were categorized as traditional or digital based on their interactions with the bank

New KPIs to capture value from digital innovation

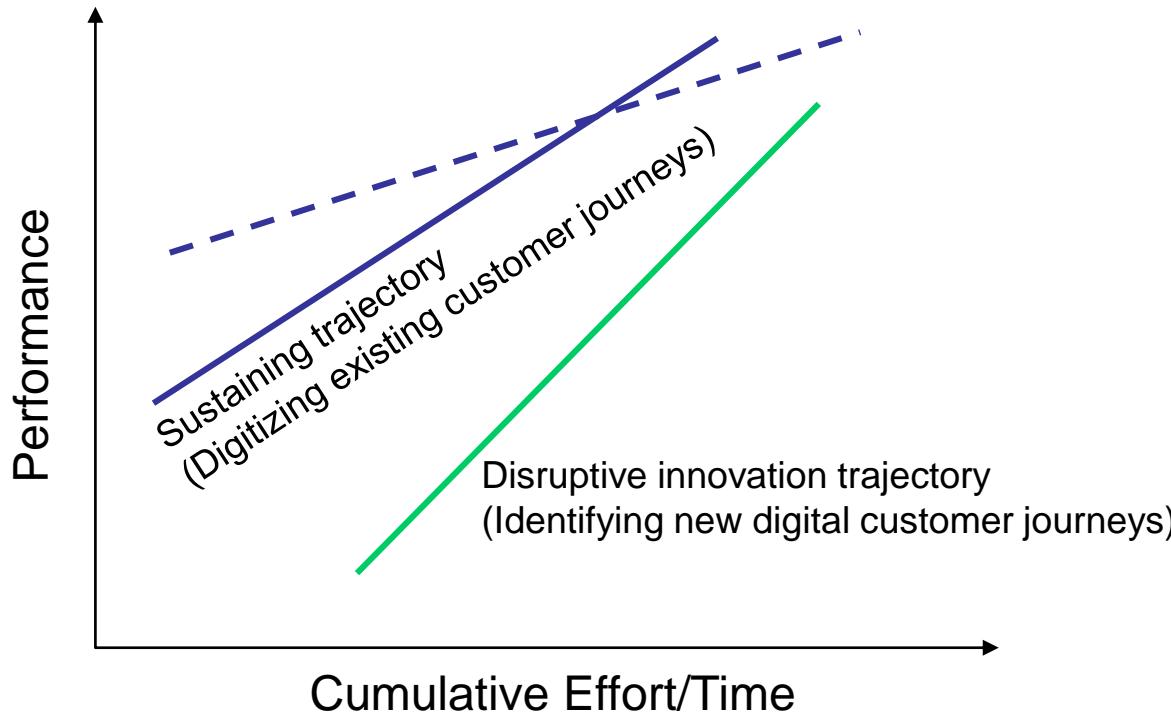
DBS Group Scorecard



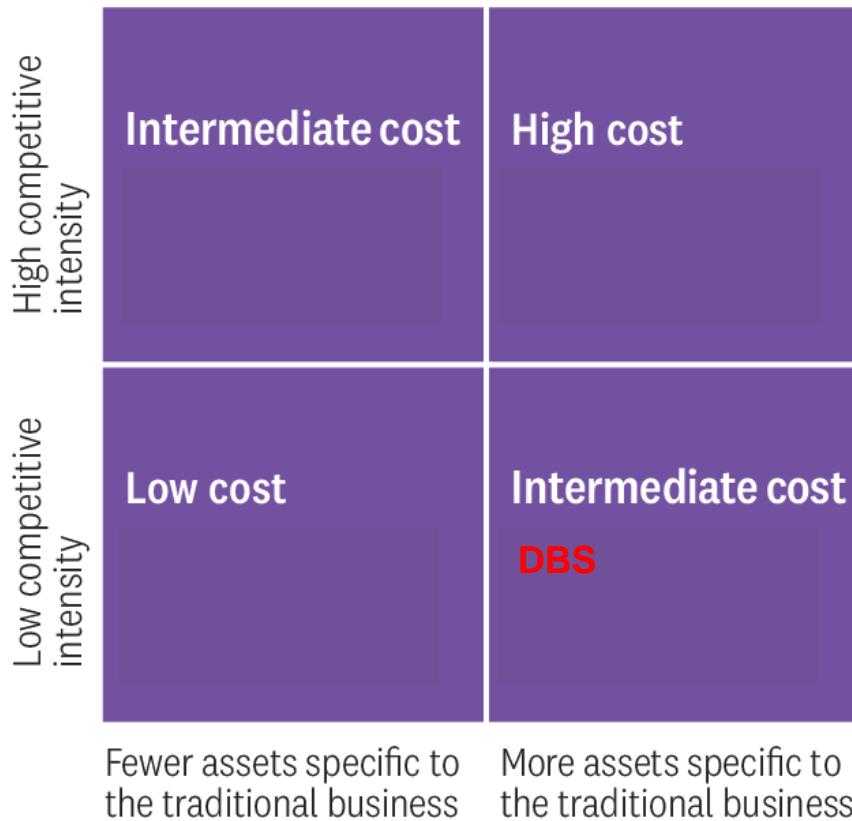
Source: Sia, Weill and Zhang (California Management Review, 2021)

Digital Transformation at DBS

Simultaneous Pursuit of Sustaining + Disruptive Innovation Trajectories



Strategic Adjustment Costs for DBS

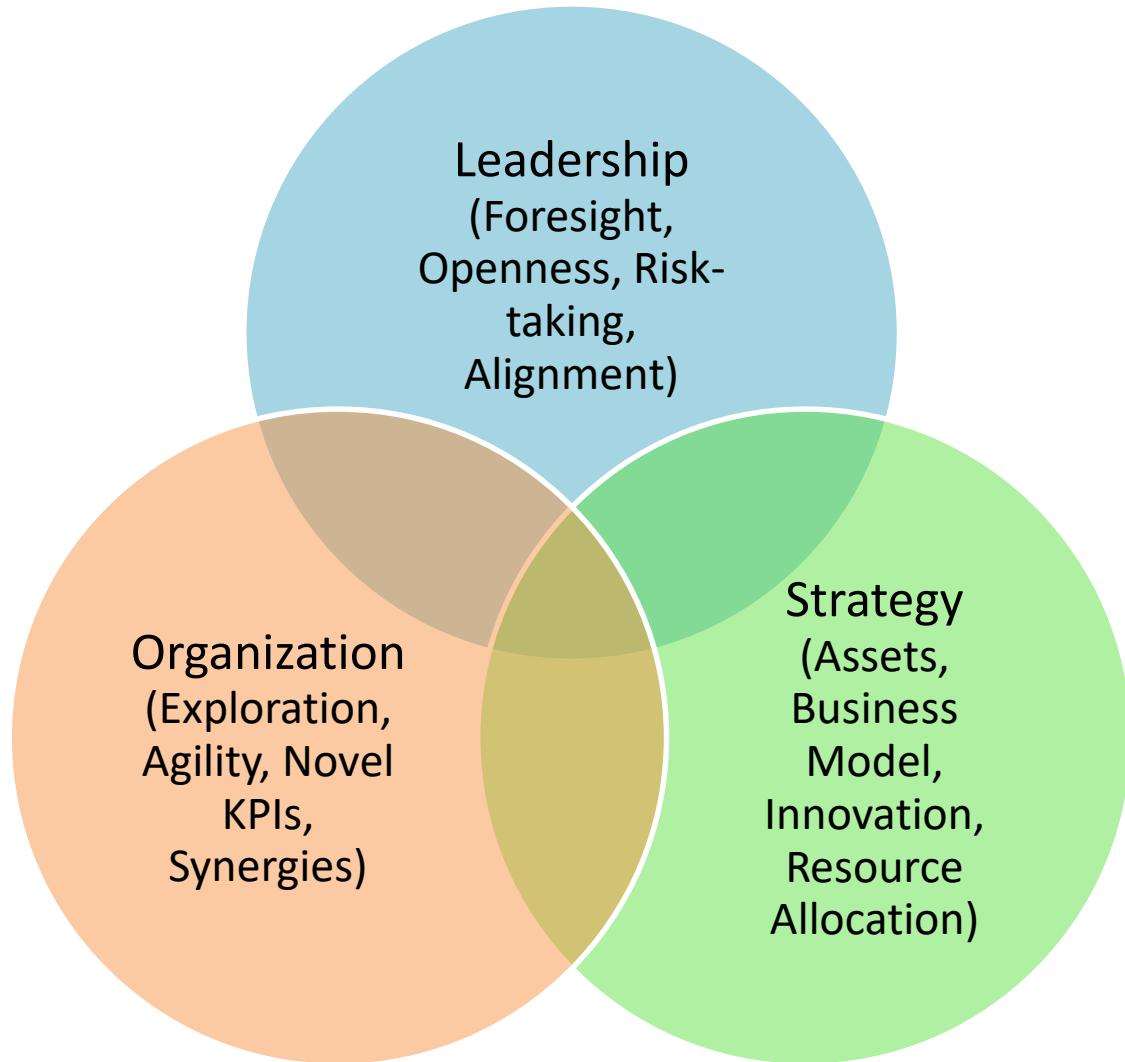


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Management of Industry Disruption



From Digital Disruption to Digital Transformation: 10 Best Practices

- Recognize the flavor of disruption (assets, business model)
- Anticipate the pace of disruption (3yrs vs. 5yrs vs. 10+yrs)
- Best time to invest in disruptive initiatives is when you are least desperate (when things are going well)
- Investments to create transformation options some of that over time lead to top line growth and eventually profitability
- Identify and manage adjustment costs (the lower the better)
- Innovate outside the sustaining trajectory (new customer journeys)
- Maximize the opportunities from the existing business
- Embrace organizational ambidexterity including the use of alliances and (small/focused) acquisitions
- Strong leadership to manage high and disciplined resource commitment to support innovation and experimentation
- Patience!