

Information Technology in Business and Society

- Value of IT

Pearl Yu



Information Technology

Module II: IT Disruption

- Emerging techs.
- How does IT changes the business and social world?



Introduction: Value of IT

- Conceptualizing IT's roles in organizations.

Module I: IT Management

- How to properly developing and managing IT projects or vendors?

Three Modules

Introduction

- Role of IT in diverse organizations
- Core model for conceptualizing IT in business

IT Management

- IT acquisition and implementation practices
- IT sourcing strategies
- IT related risks

IT Disruption

- Social media
- Mobile computing
- Big data, analytics, etc.

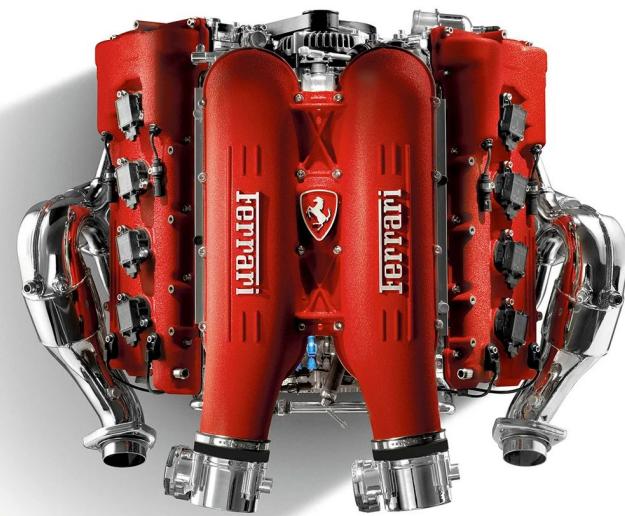
Objective

- Articulate the key components of IT systems.
- Think about the roles of IT in different organizations, after knowing some background knowledge.
- Utilize simple frameworks to analyze challenges faced by firms, and technology related decisions.

Case 1: IT Systems of Ferrari







What is behind the production?

[CIO Ferrari](#)

Google

automobile industry



All News Images Books Videos More

Tools



manufacturing



future



automotive



indian



growth



supply chain



market share



production



oligopoly



glc



Automotive industry - Wikipedia
en.wikipedia.org



the Automobile Industry ...
sliplo.shop



Indian Automobile Industry- Demand ...
tecnovaglobal.com



Automobile industry most impacted by ...
thebridgechronicle.com



Automobile Industry ...
ineteconomics.org



Automotive Industry Seeks Relaxation...



Automotive Industry Solution



automotive industry | History, Overview ...



Automotive Industry



Custom Automotive Component ...

AUTOMOTIVE
INDUSTRY

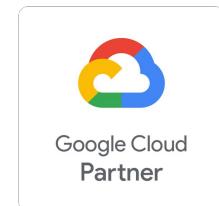
What is behind the production?

- What is managing and coordinating the highly complex production process?
 - A comprehensive information system (specifically, an enterprise resource planning, or ERP system) supports the entire production process
 - Ferrari: Software provided by the firm **infor**: Largest privately held software supplier in the world, based in NYC.
 - Porsche: Software provided by the firm SAP, 3rd largest software company in the world.
 - Other major **software suppliers** including

ORACLE



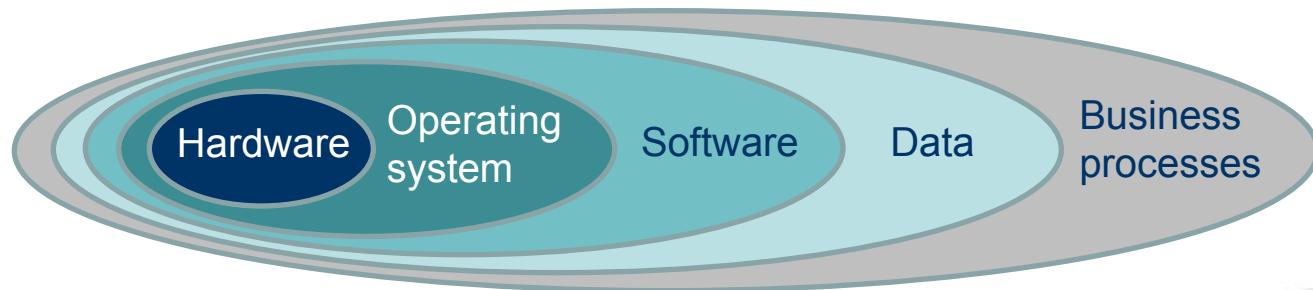
IBM



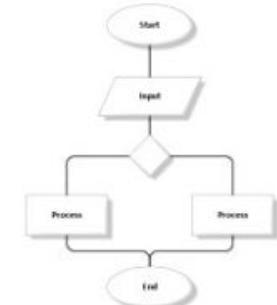
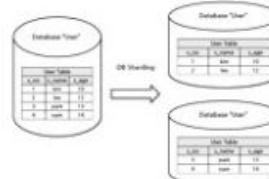
What is behind the production?

- Key components of Information systems:

Information system = Hardware + software + operating system + data + processes



macOS



Examples:

- Goals of software vendors:

What is SAP?

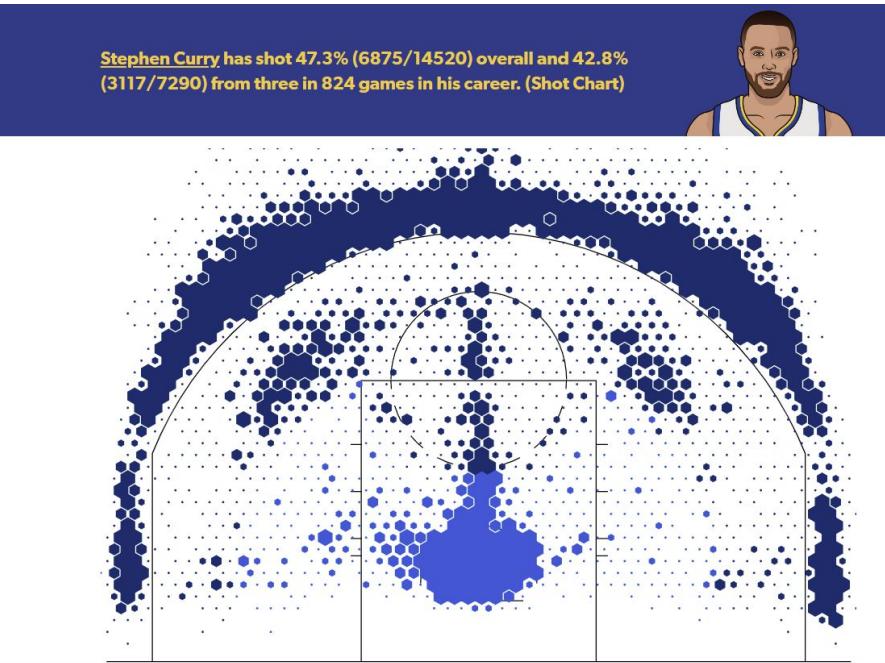
SAP is one of the world's leading producers of software for the management of business processes, developing solutions that facilitate effective data processing and information flow across organizations.

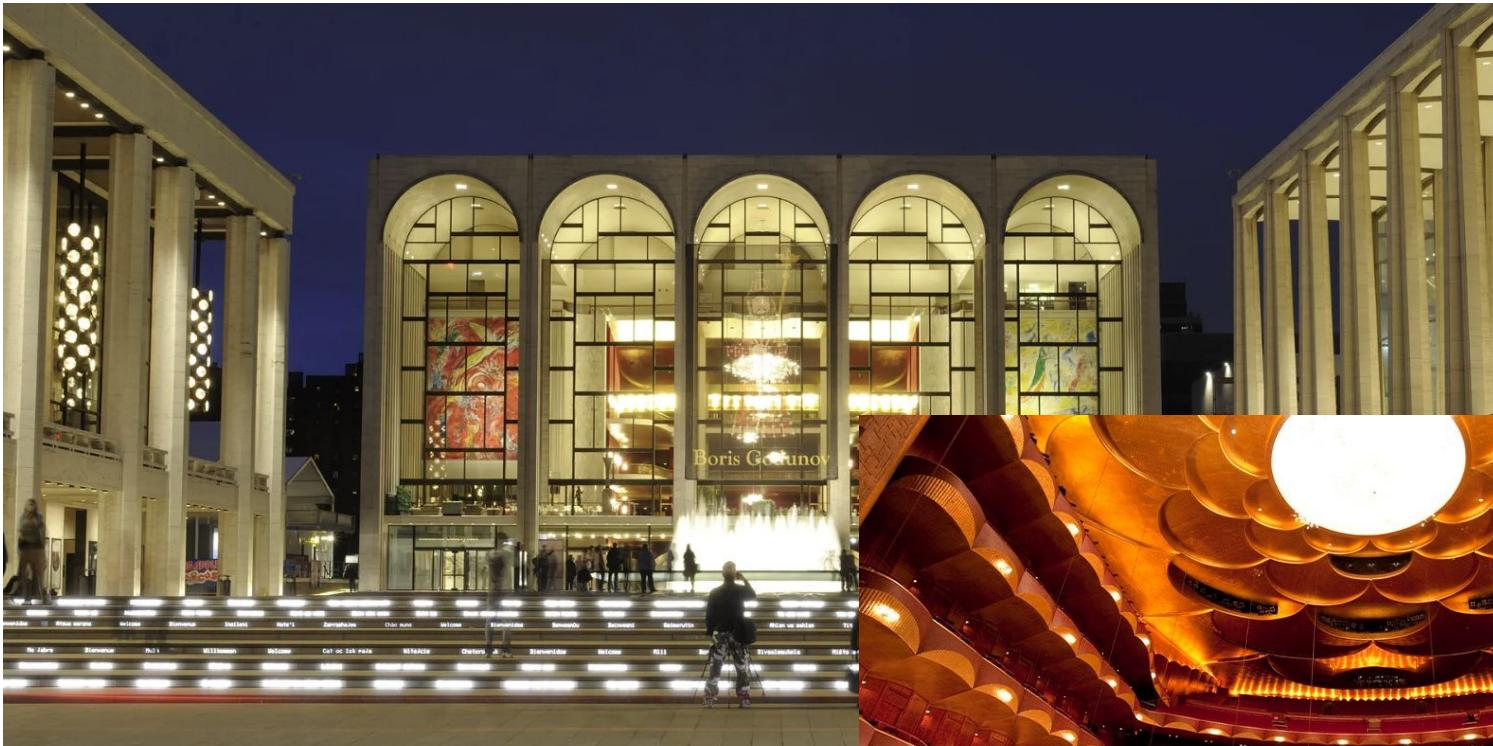
Examples: [SAP customer stories](#)

- SAP's clients, and functions SAP solutions enable.

NBA Games News Watch Summer League Free Agency Draft Stats Standings Teams Players Fantasy NBABet League Pass Sto

		FIELD GOALS				2 POINT FIELD GOALS				3 PG			
OVERALL	GP	G	FREQ%	FGM	FGA	FG%	EFG%	FREQ%	2FGM	2FGA	2FG%	FREQ%	
Overall	55	55	100	10.5	20.3	51.9	57.0	73.1	8.4	14.8	56.9	26.9	
												3 PG	
GENERAL RANGE	GP	G	FREQ%	FGM	FGA	FG%	EFG%	FREQ%	2FGM	2FGA	2FG%	FREQ%	
Catch and Shoot	55	55	21.9	2.1	4.4	47.5	58.4	8.9	1.1	1.8	63.6	13.0	
Pull Ups	55	55	56.5	5.6	11.4	48.8	53.7	42.6	4.5	8.6	51.6	13.8	
Less than 10 ft	55	53	18.6	2.4	3.8	64.3	64.3	18.6	2.4	3.8	64.3	0.0	
Other	55	28	3.1	0.4	0.6	64.7	64.7	3.0	0.4	0.6	66.7	0.1	
												3 PG	
SHOT CLOCK RANGE	GP	G	FREQ%	FGM	FGA	FG%	EFG%	FREQ%	2FGM	2FGA	2FG%	FREQ%	
24-22	55	4	0.4	0.1	0.1	100	100	0.4	0.1	0.1	100	0.0	
22-18 Very Early	55	48	11.8	1.4	2.4	56.5	64.9	7.0	0.9	1.4	66.7	4.8	
18-15 Early	55	51	20.3	2.0	4.1	49.1	55.5	13.5	1.5	2.7	54.7	6.8	
15-7 Average	55	53	48.7	5.2	9.8	53.0	57.1	38.5	4.4	7.8	56.4	10.1	
7-4 Late	55	44	8.3	0.7	1.7	43.5	45.7	6.7	0.7	1.4	48.0	1.5	
4-0 Very Late	55	44	7.0	0.7	1.4	46.2	53.8	4.0	0.4	0.8	53.3	3.0	

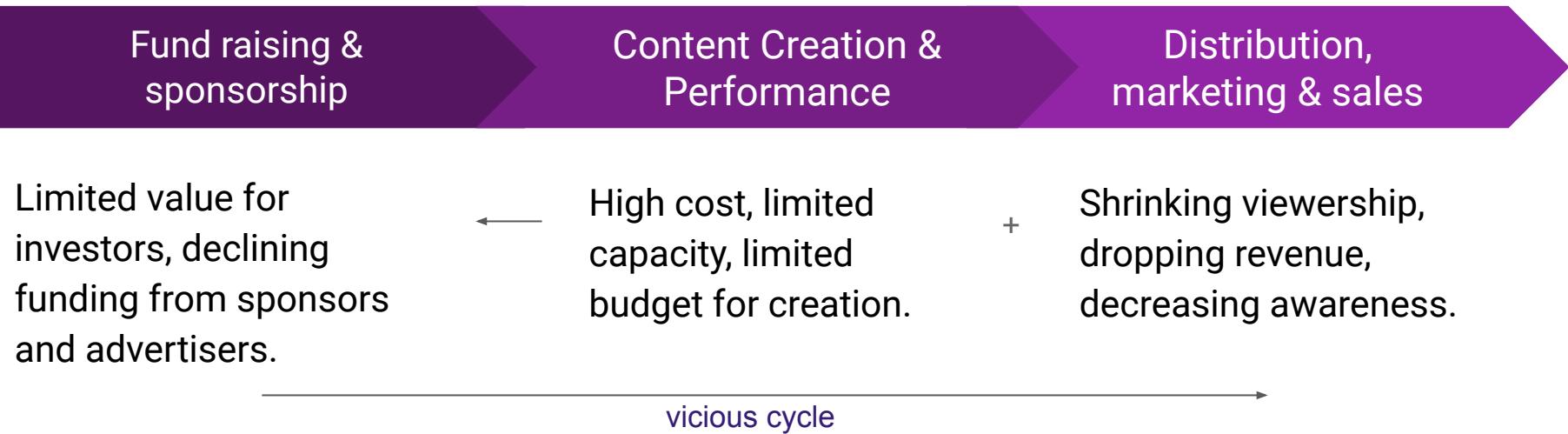




Case 2: Metropolitan Opera

MET's challenges

- Main challenges? - Using a value chain to analyze:



- Your proposal to turn this around?

MET's solution: IT/digital transformation

- Main challenges? - Using a value chain to analyze:

Fund raising & sponsorship

Content Creation & Performance

Distribution, marketing & sales

Limited value for investors, declining funding from sponsors and advertisers.

High cost, limited capacity, limited budget for creation.

Shrinking viewership, dropping revenue, decreasing awareness.

vicious cycle

Key solution: Leverage IT to digitize content and broadcast online / in movie theaters.

Improving value proposition to sponsors.
Increasing funding from endowment, ads..

Leverage IT to improve operations and lower cost.

Increase revenue (online and in movie theaters)
Broadening viewer base and raising awareness

MET's solution

- Strategic necessity

≡ MENU

The Metropolitan Opera

👤 LOGIN / REGISTER

📅 CALENDAR



Technology in Troubled Times

By Peter Clark

Technology has made a crucial difference to the Met at several critical points in its history. The Nightly Opera Streams introduced when the season was cut short by eight weeks due to the Covid-19 pandemic, as well as the recent At-Home Gala, are just the latest examples of the Met using technological platforms to confront a crisis.

MET's solution

- Strategic necessity

1930..radio broadcasting

Brought in \$300,000 in 2 months



1970... Marketing department,
Televised recording deals



Around 2006

Live in HD
Online and in-cinema



2020

'At-home' Gala. Live streaming!

NEW YORK ▾ EN ▾

TimeOut

Things to Do Food & Drink Culture Theater Travel Time Out Market Love Loc



Photograph: Ken Howard | Lucia di Lammermoor

The Metropolitan Opera is streaming family-crisis operas every night this week

The Met's new free lineup includes complete works by Verdi, Wagner, Strauss and Nico Muhly.

Case 3:

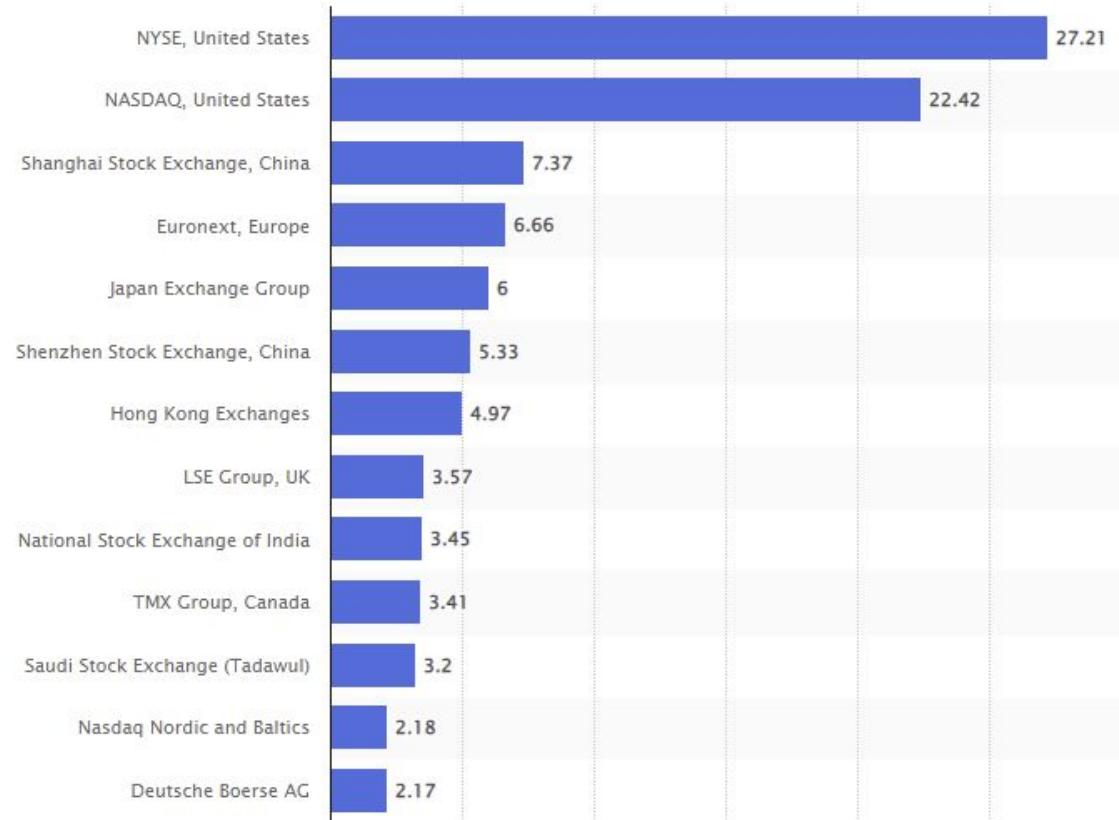
Nasdaq and Facebook IPO



Financial market

- Security exchange: a marketplace where brokers and traders can buy and sell securities (such as stock shares, bonds, and other financial instruments.)
- The largest stock exchanges in the world:
 - NYSE
 - Nasdaq
 - Tokyo Stock exchange/Shanghai
 - HK Stock Exchange
 - Euronext
 - ...

Largest stock exchange operators worldwide as of March 2022, by market capitalization of listed companies



All rely heavily on IT trading platforms!

Nasdaq - 100% virtual



Nasdaq's IT system

- What is the role or value of IT at a stock exchange?
 - Enabling stock transactions
 - Ensuring high speed, lower the cost, sufficient liquidity of the financial market
 - Providing market information (such as Nasdaq index) to individuals and institutions
 - Leasing technology services and sells data solutions to other companies.

Characteristics of Nasdaq's IT

- Nasdaq's IT infrastructure at the center of this global financial markets.
 - High volume of trades (~2 billion shares daily)
 - High speed transactions (milliseconds per transaction)
 - High interconnectedness (connection to diverse stakeholders)
 - High complexity (sophisticated algorithms, software & hardware)

Initial Public Offering (IPO)



Initial Public Offering (IPO)

- Definition
 - The first time shares of a company are sold to the general public, on a securities exchange.
 - Through this process, a privately owned company transforms into a public company.
- Implication
 - Opportunities: Raising capital for growth, monetizing ownership of the company, increasing prestige and public image.
 - Responsibilities: Disclosing financial and business activities, ensuring transparency to the public, increasing legal, PR costs.
- A major milestone for firms

Facebook IPO Incident

Let's watch this.

- What happened?
 - 11:00am: Nasdaq system crashed. No transaction happened.
 - In response, Nasdaq switched to its backup IT system.
 - The system ignored orders till 11:30 am
 - 30 million shares were submitted already.
 - 11:30am Trade resumed. (Traders unsure of orders confirmed.)
 - Prices were wrong. Some trades were executed. Many were not.

Facebook IPO Incident: Causes

- What're the causes of that nightmare?

IPO strategy: No buffer, Nasdaq kept accepting orders till the last minute. Overconfident.

Culture: Underestimated the demand and overconfident about its capacity.

Preparation: Not sufficient testing.

Highly anticipated IPO. High-volume of orders.

Nasdaq's system is very complex. No system can have 100% reliability.

Facebook IPO Incident: One Decision

- At the turning point, what would you do?
 - 11:00am: Nasdaq system crashed. No transaction happened.
 - In response, Nasdaq switched to its backup IT system.
 - The system ignored orders till 11:30 am
 - 30 million shares were submitted already.
 - **11:30am** Trade resumed. (Traders unsure of orders confirmed.)
 - Prices were wrong. Some trades were executed. Many were not.

Should they resume trade at that time? Or postpone it to the next day?

Facebook IPO: Action Plan

Resuming trade at 11:30am.

Benefits:

- Capitalize on market momentum
- Limited damage if the errors can be fixed soon.

Risks:

- More errors if slow fix.
- Worst case: Not being able to fix till end of day.

Postponing to the next day.

Benefits:

- Sufficient time for a fix.
- Fewer technical errors.

Risks:

- Lawsuits!
- Reputational damage.
- Breaking the market momentum, affecting price.

Facebook IPO Incident: Action Plan

- What would you do?
 - Short term: Technical fix.
 - Medium term: Contingency planning (improving the backup system)
 - Long term: Investment in technology and management, ongoing upgrade and test of the system, external auditing
 - Overall: Rethinking the IPO strategies.

Nasdaq's IT system

Alibaba worried about Facebook IPO as considered Nasdaq versus NYSE

By Jessica Toonkel, John M



Markets Tech Media Success Video

(Reuters) - Alibaba (stock without lifting

The 2012 attempted IPO of Bats Global Markets could not have gone any worse.

MARKETS

▲ DOW

▲ S&P 500	3,825.33	+39.95	+1.06%
▲ NASDAQ	11,127.85	+99.11	+0.90%



What emotion is driving the market now? Click here to see today's reading

What's open and closed on July Fourth this year

Healthcare stocks may keep your portfolio from needing a checkup

Japan's Tokyo Stock Exchange suffers its worst outage ever

By Laura He and Yoko Wakatsuki, [CNN Business](#)

Updated 1:10 PM ET, Thu October 1, 2020

Nasdaq - a tech company?!



- A qualitative decision about how long to postpone the trade. 'If you pause for too long, it's like fire: People rush to exit.'
- 'I'm always a tech person.'
- Challenge: cultural shift towards IT driven.

Nasdaq's IT system

The image shows a man in a suit sitting at a podium, speaking into a microphone. Behind him is a large projection screen displaying a slide titled "Leveraging Four Strong Business Segments". The slide features the Nasdaq logo and four circular icons with text descriptions:

- Market Technology**: Operating and powering the world's leading marketplaces.
- Information Services**: Trusted data, index and analytics.
- Corporate Services**: A leading position in listings and C-Suite tech offerings.
- Market Services**: Diverse portfolio of North American and European markets.

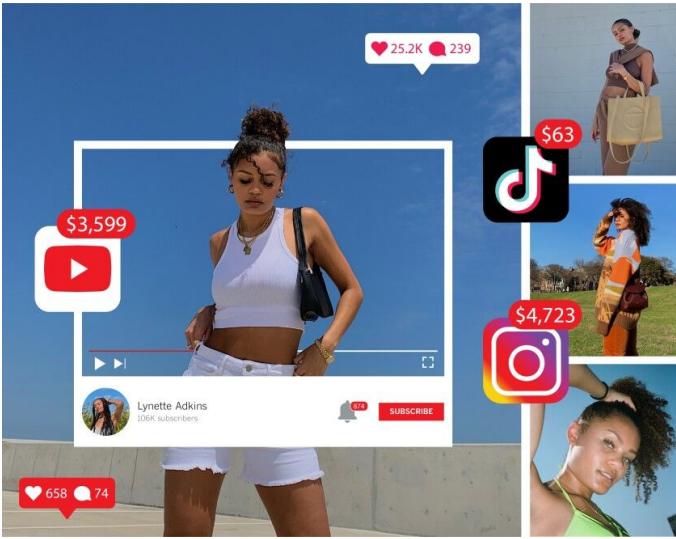
To the right of the slide, two additional circles are shown: "Key Growth Segments" and "Foundational Segments". The video player interface at the bottom includes controls for play, volume, and navigation, along with a timestamp of 1:08 / 16:45.

'A technology company with capital market roots.'

Takeaways

- IT is a less visible, but critical part of business and global economy.
- IT issues = business issues: IT can directly impact the performance and competitiveness of businesses.
- Companies need to balance cost with performance; value with risk.

Case 4: Zara - Fashion & retail



Zara

- What do we know about Zara's overall strategy?
- Context: how does the fashion industry work?
- Decision: Should Zara upgrade its IT?

Zara

- How was your experience shopping at Zara?



Zara's strategy

- 4P Marketing Mix

- Invest in locations and stores.
 - High-traffic locations.
- Mid-range.
- 'Premium' image but affordable prices



Higher-end: Versace, Chanel, LV...
Competitors: H&M, Uniqlo, ASOS.
Lower end: Private label brands..

- Does not rely on traditional advertising a lot.

- Trendy designs.
- Variety.
- Low durability.

Zara

- What're the characteristics of the company's structure?
 - **Organization**
 - Decentralized decision making;
 - Autonomy among the managers.
 - **Operation**
 - Vertical integration (controlling its own value chain)
 - Pros: control, speed, complexity
 - Cons: high investment, complex, risk
 - **Culture**
 - Human-centered. Imperfect but efficient and flexible

Do you think the structure is well aligned with the company's overall strategy?

Zara

- How does the fashion industry work?



Zara



Zara



2021: In America: A Lexicon of Fashion

For the return to the Met Gala after the COVID-19 pandemic, the theme was In America: A Lexicon of Fashion. Guests were instructed to wear "American independence." Stars such as Timothée Chalamet and Billie Eilish wore American-inspired outfits.

Zara

2016: Manus x Machina: Fashion in an Age of Technology



Zara

- How does the fashion industry work?



Schiaparelli



PRADA



VERSACE

ZARA

DOS

- How would you describe Zara's IT system?
 - Support: Minimal and suboptimal, but effective and efficient.



Zara

March 30, 1999		Sensible Cinema Software		Tuesday 12:44 pm	
TICKETS SOLD: 0		SHAKESPEARE IN LOVE		SEATS REMAINING: 141	
		Rated: R			
	2:15	4:45	7:15	9:30	
HOT KEY	TICKET CATEGORY	TICKET PRICE	NUMBER SOLD	SALE AMOUNT	CASH REGISTER TOTAL SALE: \$ 0.00 AUDITORIUM #1 0% SEATS:  LAST SALE: \$ 0.00
[F1]	GENERAL	\$ 1.50	0	\$ 0.00	
[F2]	DISCOUNT	\$ 0.75	0	\$ 0.00	
[F3]	PASSES	\$ 0.00	0	\$ 0.00	
[F4]	ROCKYHPS	\$ 4.00	0	\$ 0.00	
[F5]		\$ 0.00	0	\$ 0.00	
[F6]		\$ 0.00	0	\$ 0.00	
TEND/CHANGE \$15=  \$30=  \$60= 		\$ 5=  \$20=  \$40=  \$80= 		\$10=  \$25=  \$50=  \$100= 	
[F7] = REFUNDS		[F9] = FEATURE		[F11] = SYNOPSIS	
[F8] = EXIT		[F10] = SHOWTIME		[F12] = MENU	
[↑8] = MULTI		[+6] = STAY-RETURN		[+4] = FLASH B.O.R.	
Terminal #1		Boxoffice Professional Version (c)1999		369k Free	

Zara

- DOS:
 - A family of disk operating systems introduced in the 1980s for personal computers (PCs)
- Main version:
 - MS-DOS (Microsoft disk operating system): an operating system for x86-based personal computers of Microsoft
 - IBM PC DOS: (IBM personal computer disk operating system): an operating systems for IBM PCs
- Characteristics:
 - Command line interface
 - **High stability, but limited functions** (compared to other OS)

Zara



Zara

- Should Zara upgrade the technology?

Benefits

- Ongoing **support** from software vendors
- Reduce labor cost and increase **efficiency**
- Real-time, accurate inventory data
- **Cross-store sales** and improve customer services
- Platform for future growth (online and global)

Risks

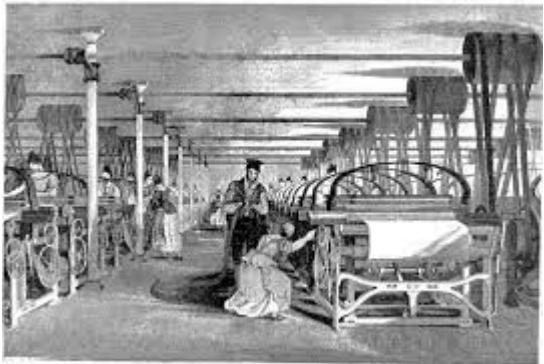
- **Cost** (investments and ongoing spending)
- Increased complexity.
- Transition to the new system leading to disruption.
- Opportunity cost.
- Change the **human-centered culture** and DNA.

Zara

- In 2008/9: Zara chose not to upgrade its system
 - The information system was functioning well.
 - The company was growing rapidly.
 - The management didn't want any disruption to its growth: postponed system upgrade into the future.

But When is a good time to upgrade?

The History



1800s Industrial revolution
The start of mass production.

1960s - 1980s

Young people embrace new trends and cheap clothing
Textile mills.



2000s

Pinnacle of 'fast fashion'

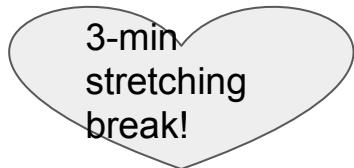


Till 2020

- Globalization
- IT upgrade
- Moving online

Using IT to Turnaround

- After the pandemic, 1bn investments into IT
 - the 2022 horizon
- Upgrading IT to:
 - Increase online sales
 - Improve customer experience
 - Integrate global network
 - Social issues: sustainability



IT Strategic Alignment Model

The three pillars need to be well aligned!



Structure

- Organization: decision-making, controls
- Operations: production / mgmt process
- Culture: values, styles

Decentralized, vertical integration, human centered.

- Position: where are we in the industry
- Purpose: what do we want to achieve
- Plan: how do we get there

Mass market, deliver products quickly.

System

- Strategy -> System: what IT system do we need to implement business and organizational strategies?
- System -> Strategy: what business strategies do we need to use information systems to create an advantage?

Zara

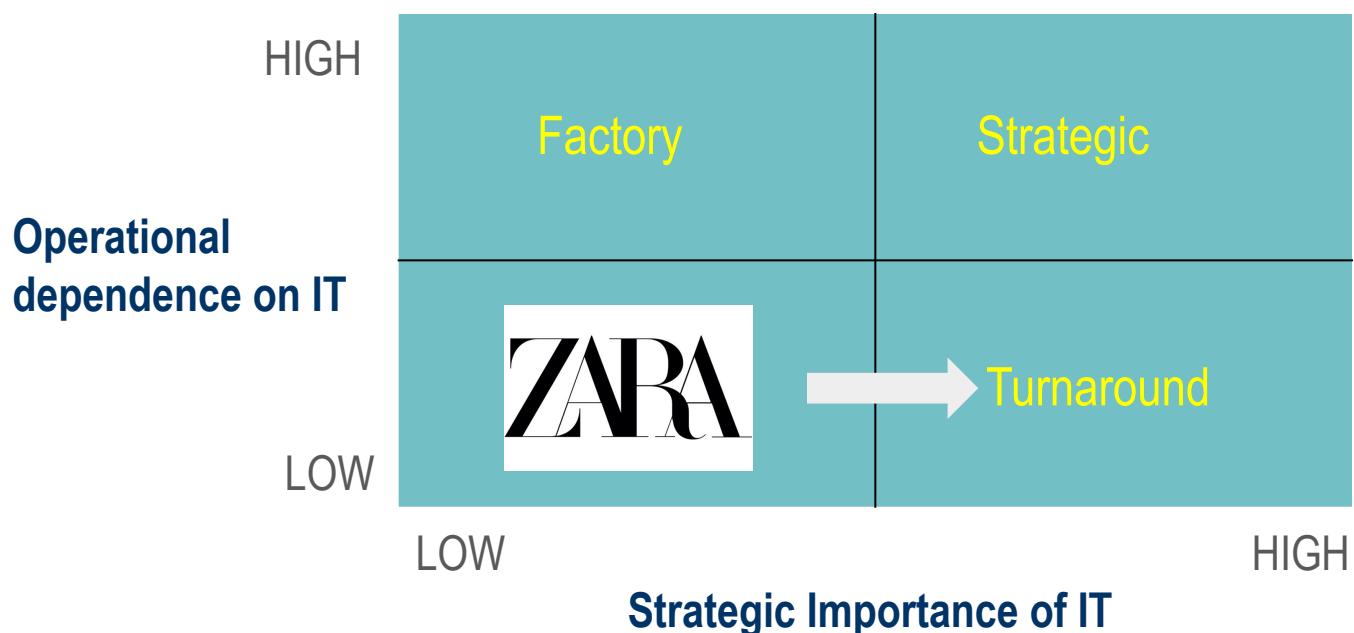
Zara - Key Takeaways

- Strategy, structure, system need to be aligned.
- For Zara, it's Strategy driving the system.
 - IT supports an existing, well-defined strategy.
- IT could help improve business, but it might require organizational change.
 - Zara chose to postpone IT upgrade.



IT Strategic Grid

To conceptualize IT's roles in organizations.



IT Strategic Grid

To conceptualize IT's roles in organizations.

The roles can shift!

