

# **“INTERNAL DESIGN ELEMENTS: CULTURE & TECHNOLOGY”**

Module 5

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Entrepreneurship & Innovation (ETKS)

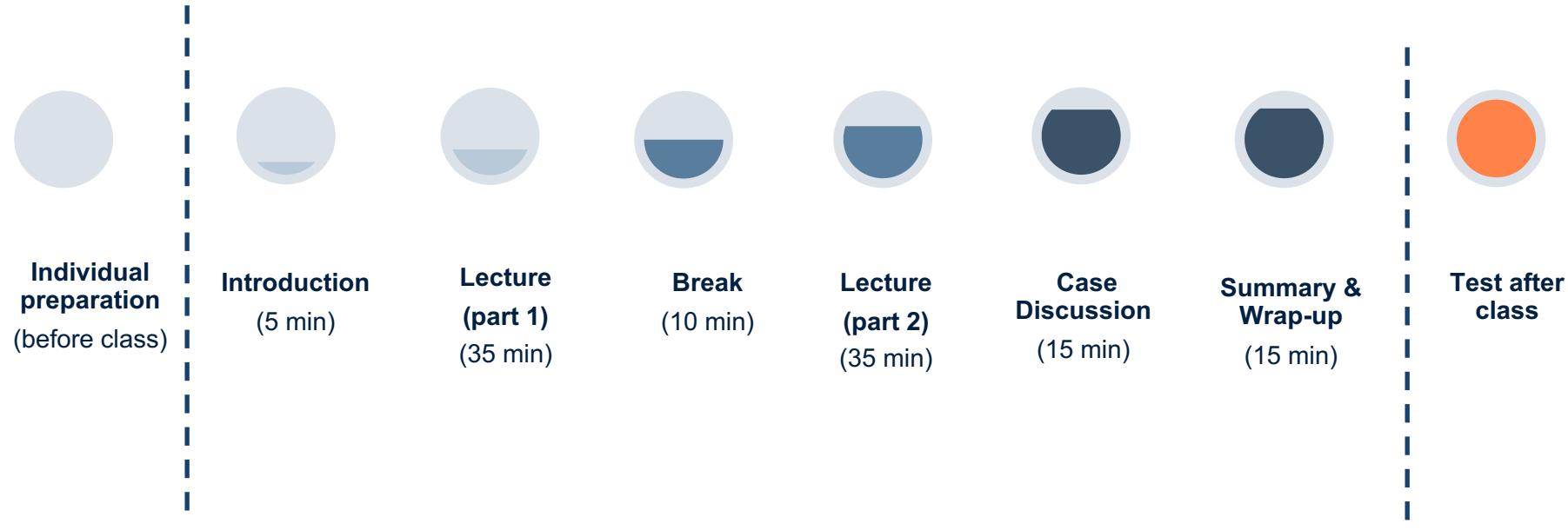


# Intended Learning Outcomes

After completion of this module you should be able to:

- a) Describe what an organization is, demonstrate knowledge of foundational theories that explain the emergence of organizations, and detail various perspectives on organizational design. Argue for why organizational design and management is relevant in the context of engineering.
- b) Outline and contrast different types of physical organizational structures and explain the **influence of technological development** on recent trends in organizational design.
- c) Specify the different attributes of **internal organizational culture** and external environment, and connect this to their role in organizational design.
- d) Account for innovation and change and their impact in how industrial activities are managed
- e) Be able to discuss attributes of technology-based business models and the dynamic of value creation, value delivery and value capture in industrial enterprises, including interaction with the value chain.
- f) Identify and name different types of projects, stages of a project, project roles, project management perspectives and project management tools.
- g) Apply gender and sustainability related perspectives on the analysis of industrial enterprises both in writing and in dialogue with others, supported by basic concepts and theories within the area of organizational theory and project management

# Agenda

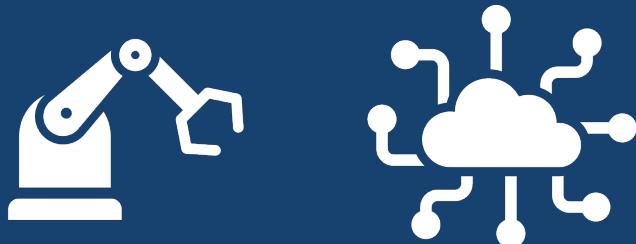


# **REFRESHER OF KEY CONCEPTS #1**

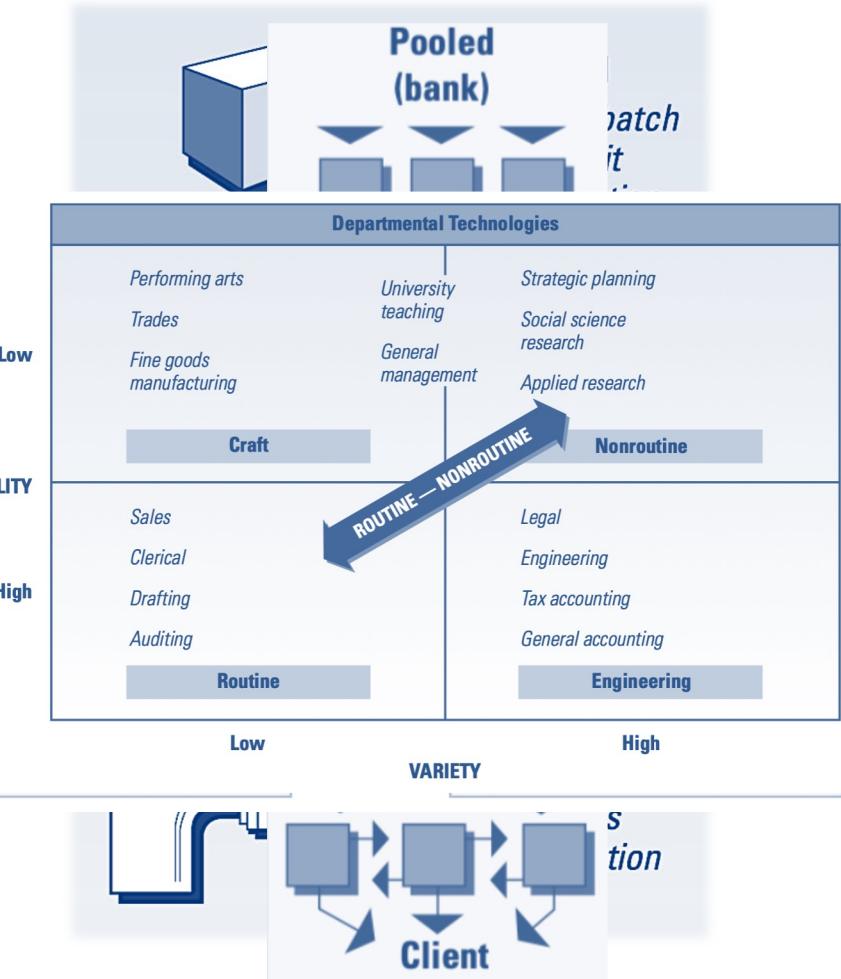
## **ROLE OF MANUFACTURING AND IT TECHNOLOGY**

**Technology** refers to the work processes, techniques, machines and actions used to transform input into outputs.

Technology influences design of **organizational structure**, applied for **decision making** and **control**, add strategic value through the use of **internal** (e.g., intranets, resource planning, knowledge management systems) and **external coordination and collaboration** (e.g. extranets, customer-relationship systems, e-business, and the integrated enterprise)





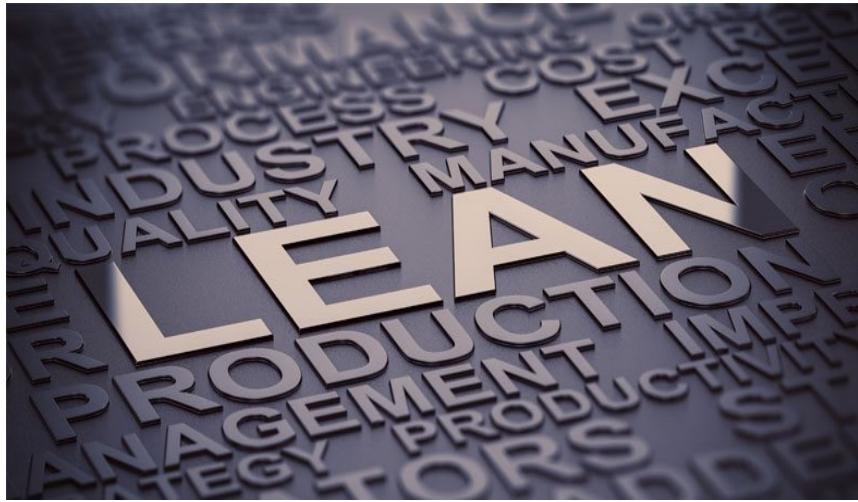


# Research on influence of technology on organizational design

**Woodward's research (1958, 1965)** suggested differences in organizing for “small-batch”, “large-batch” and “continuous” production. **First noticed influence of technology on organizational design.**

**Perrow (1967)** – degree technological uncertainty - predictability of input (variety of tasks) and output (established routines to undertake the task).  
Overall, the more routine the work implies, the higher levels of centralization and formalization.

**James Thompson (1967)** – pooled, sequential, reciprocal processes. **The higher the interdependence – the more horizontal integration is needed.**



# Lean Manufacturing

**LM** (heart- people, maximize productivity):

- Eliminate waste
- Sustainability
- reduce lead time
- lower operating costs
- improved product quality

# Flexible manufacturing systems

**FMS** (also smart factories, computer integrated manufacturing etc.):

- allows for mass customization, tailoring products to customers' needs
- efficient machine utilization
- labour productivity increase
- scrap rates decrease
- increased customer satisfaction



## Example: Automated disassembly process by Apple



**Liam** is an Apple R&D project focused on new disassembly technologies. It utilizes a **fully autonomous, clean take-apart process** to liberate and separate individual components **for speciality material recycling**.

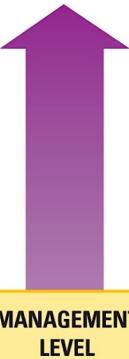
# FMS & Organizational design

Characteristic	Mass Production	FMS
<b>Structure</b>		
Span of control	Wide	Narrow
Hierarchical levels	Many	Few
Tasks	Routine, repetitive	Adaptive, craftlike
Specialization	High	Low
Decision-making	Centralized	Decentralized
Overall	Bureaucratic, mechanistic	Self-regulating, organic
<b>Human Resources</b>		
Interactions	Standalone	Teamwork
Training	Narrow, one time	Broad, frequent
Expertise	Manual, technical	Cognitive, social: solve problems
<b>Interorganizational</b>		
Customer demand	Stable	Changing
Suppliers	Many, arm's length	Few, close relationships

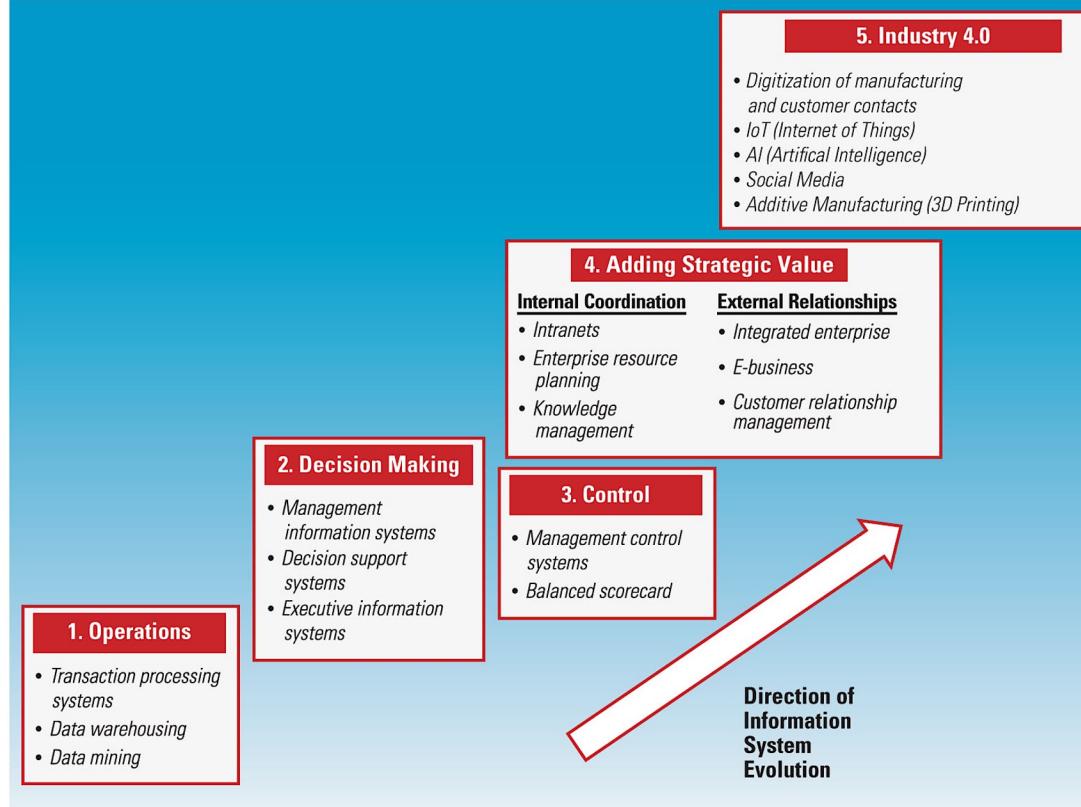
# Information Technology Evolution

- **Information technology (IT)** has transformed many industries.
- Highly successful organizations today typically most effectively collect, store, distribute and use information.
- As the complexity of computer-based IT systems has increased, applications have grown to support top management control and decision making about complex and uncertain problems.

**TOP**  
(strategy, plans,  
non-programmed)



**FIRST-LINE**  
(operational,  
past, programmed)



Low

**SYSTEM  
COMPLEXITY**

High



MOBILE &amp; WEARABLES

TABLETS

HOME APPLIANCES

TV &amp; AV

## One day only offers

Take advantage while you still can

00 : 15 : 51 : 04

Days

Hours

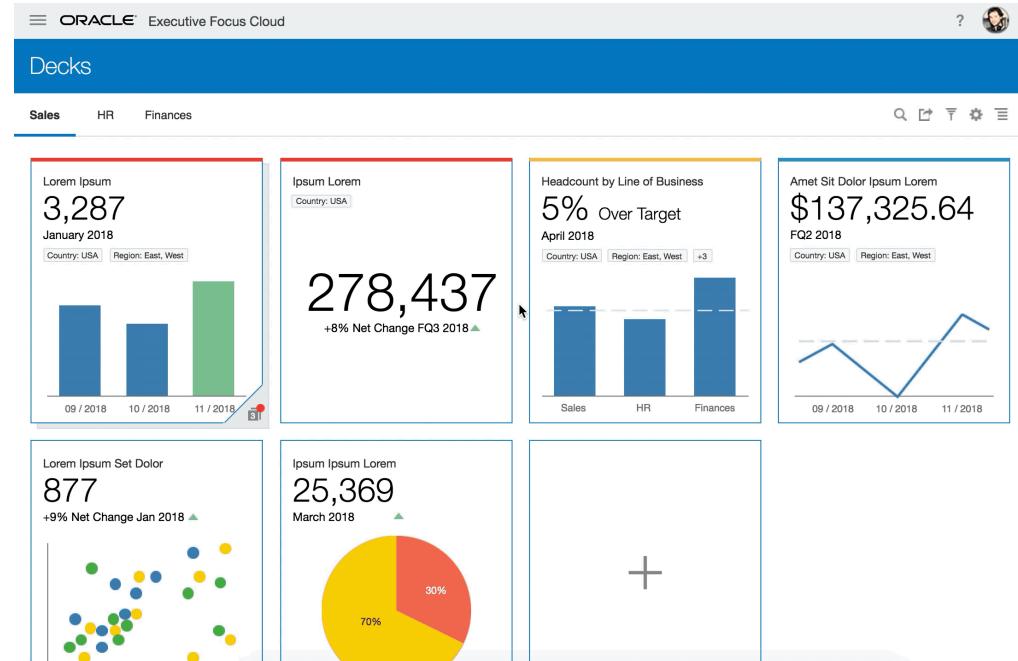
Minutes

Seconds

Save on top products like the Galaxy S8+ with Dual SIM

There's not long left to grab a brilliant one day only offer. Remember, just spend over £250 to save 5% using code\*: SUMMER5 or spend over £500 to save 10% using code\*: SUMMER10. Get some top tech for less while stocks last.

# Examples of decision-making analytical tools & CRM systems





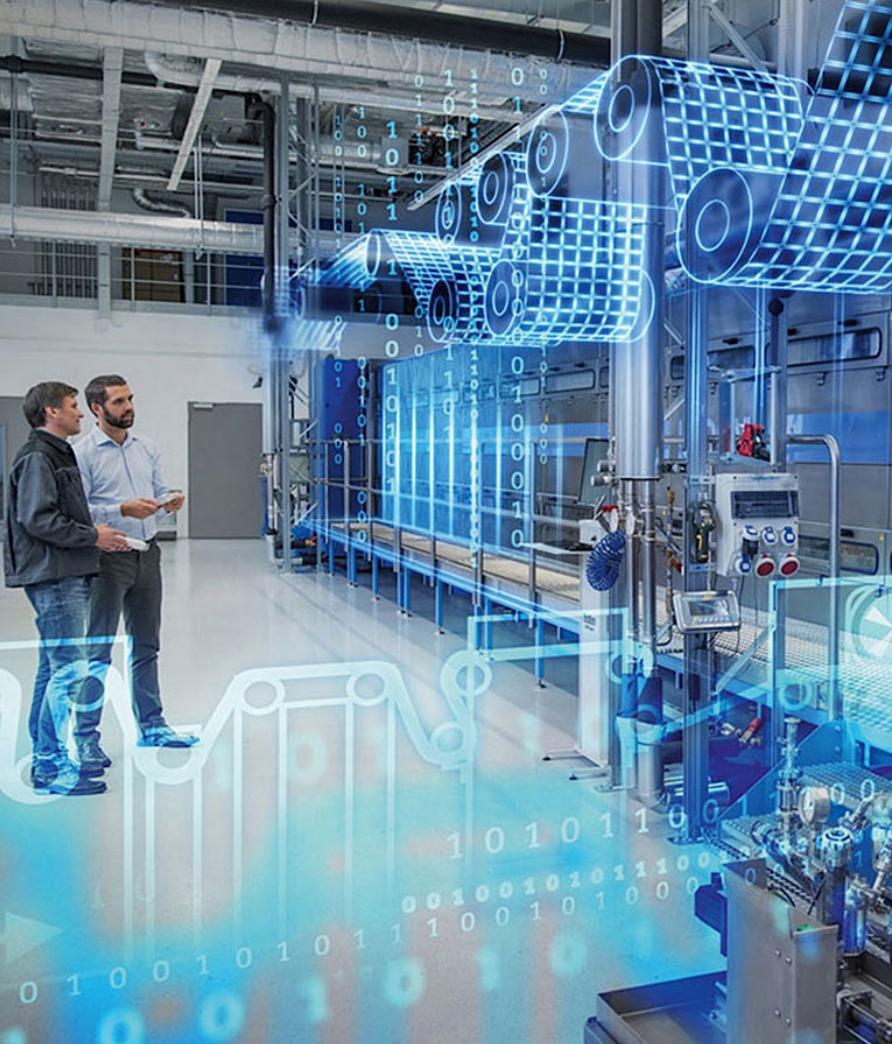
## Example: Netflix

- **Data analytics** can help determine which products to invest to
- Netflix invested in two first seasons of House of Cards without ever producing the pilot. Decision was based on data analysis from focus group users (Kretschmer & Khashabi, 2020)

# Example: digital services



- **Digital servitization** - technology-enabled advanced services *rely heavily on digital components embedded in physical products*. Refer to bundles of products and services aimed at solving customer problems by delivering targeted results or outcomes. (Linde, Frishammar, & Parida, 2021)
- **Komatsu Forest's** proactive service agreement, **ProAct 2.0**, which offers contractors optimized equipment uptime through *proactive maintenance* and *spare-part management*, all enabled by *smart, connected machinery monitored by the provider's service workshops*.
- Digital servitization is also a more **sustainable solution** as it helps to retain value through proactive maintenance



# IT Impact on Organization Design

- Smaller organizations
- Decentralized organizational structures
- Improved horizontal coordination
- Improved interorganizational relationships and network structures
- Enhanced control, speed of decision-making

# Course Feedback



# BREAK

# **REFRESHER OF KEY CONCEPTS #2**

## **CULTURE**

**Organizational culture** is the set of values, norms, guiding beliefs and understandings that is shared by members of an organization and defines what is **encouraged or discouraged** in the group (Daft, Murphy, & Willmott, 2020).



Culture is **shared, pervasive, enduring and implicit** (Groysberg et al., 2018)





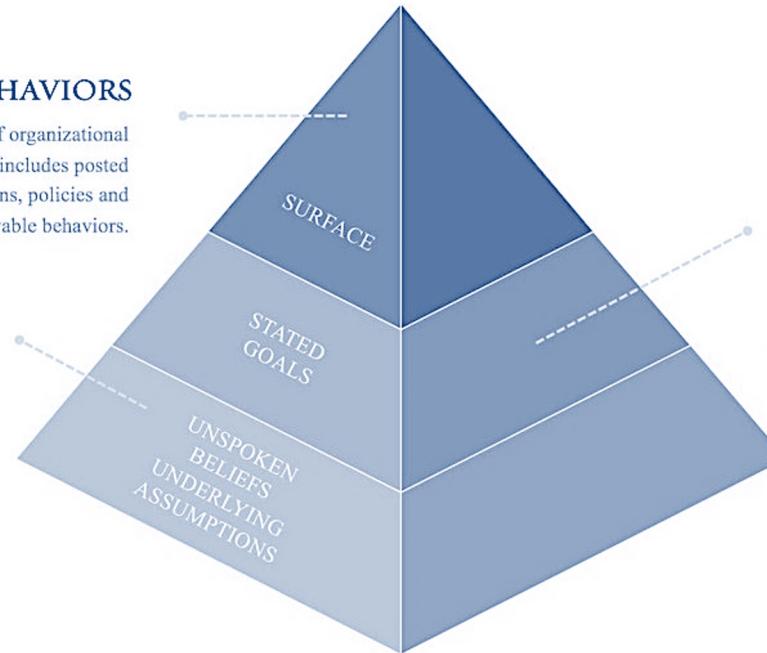
# SCHEIN'S CULTURE MODEL

## ARTIFACTS & BEHAVIORS

This is the easiest part of organizational culture to see and touch. It includes posted values, office layout, plans, policies and observable behaviors.

## TACIT ASSUMPTIONS

These are the norms, assumptions, tacit knowledge that govern the organization and have the biggest impact on decision-making. These are the things most people ignore.



## ESPOUSED VALUES

This is what a company says it stands for and claims to value. These are often times completely incongruent with actual behaviors.

# Observable aspects of culture

- **Rites and ceremonies** – special occasions that reinforce specific values and create a bond among people
- **Stories** are narratives based on true events that are frequently shared among employees
- A **Symbol** – something that represents another thing
- **Language** – specific saying, slogan, explicit values or other form of language to convey special meaning to employees
- **Dress code**
- **Infrastructure / office decorations / colours**





## Dress code example

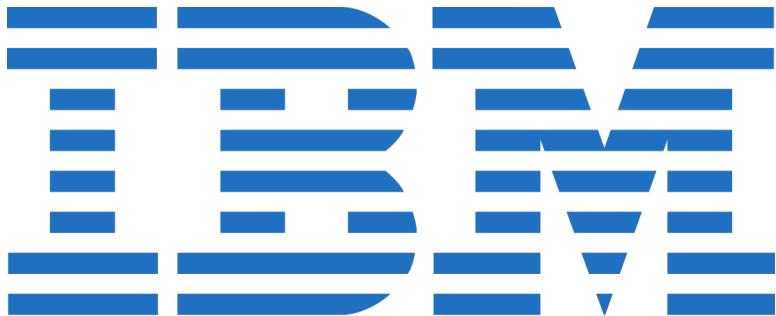


# Google office space norms



- Google built its New York City with the **principle that employees should never be more than 150 feet from some form of free food**—creating gathering places for workers to interact.
- They wanted to engineer serendipity, creating these kind of casual hallway and cafeteria conversations where the **genesis of a lot of great ideas take place**.

# Story example

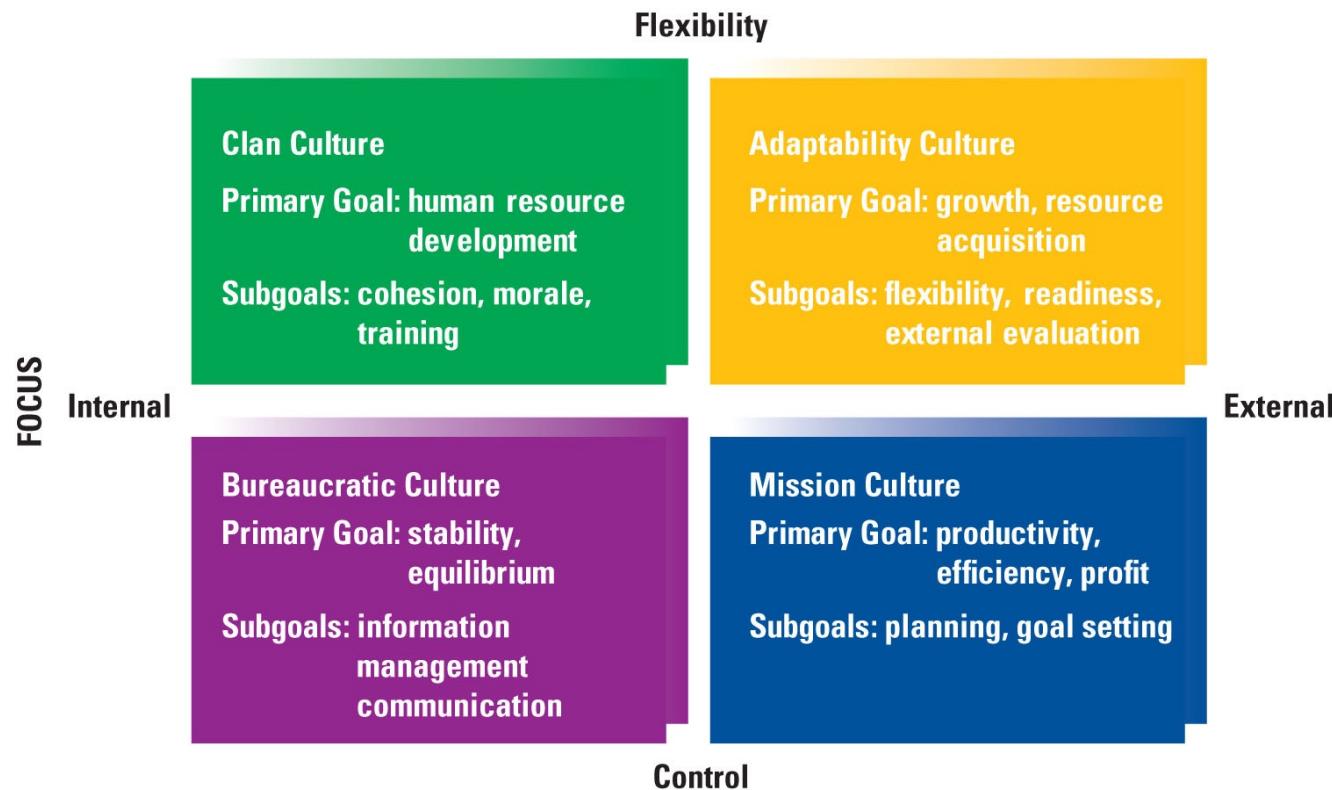


*"Thomas Watson, Jr., IBM Board Chair, was not permitted to enter a secure area of IBM without correct clearance identification. A 90-pound young woman stopped him! The man accompanying Watson was stricken, and someone hissed, "Don't you know who he is?" Watson instead instructed someone to go get his badge"*

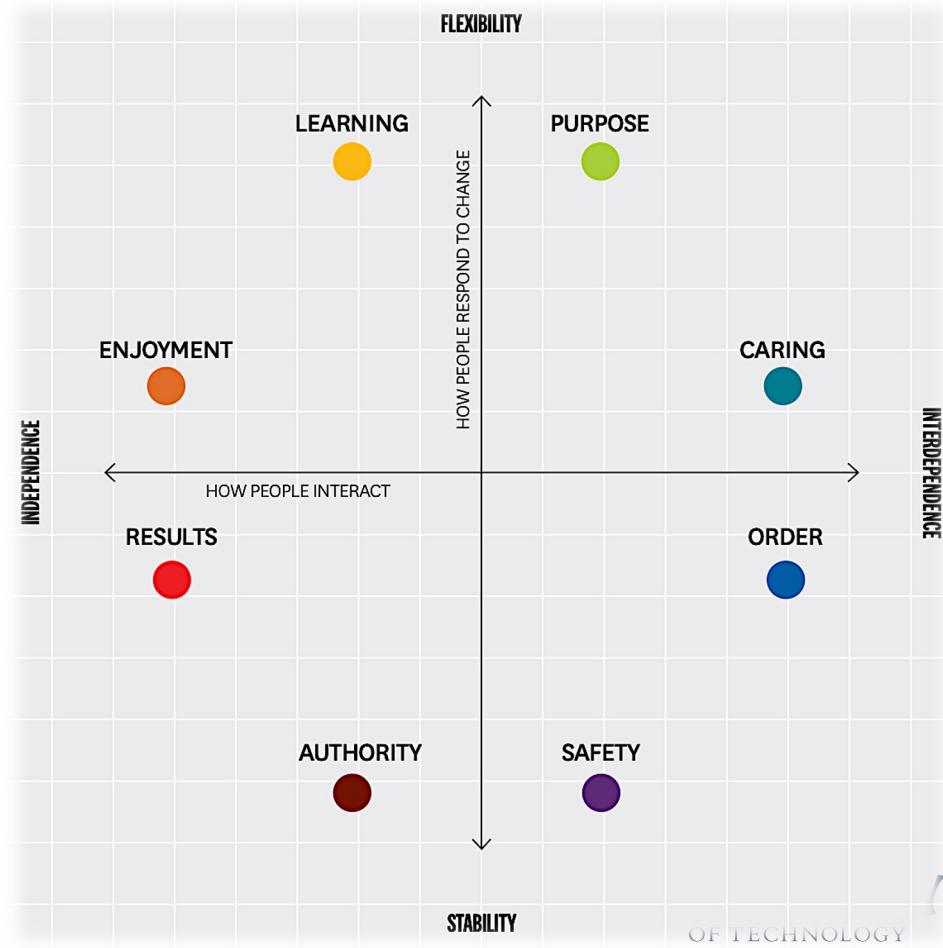
**- teaches that everyone, despite the status must follow rules and that employees must enforce rules even if their superiors are those breaking them**

# Organizational design & Culture types

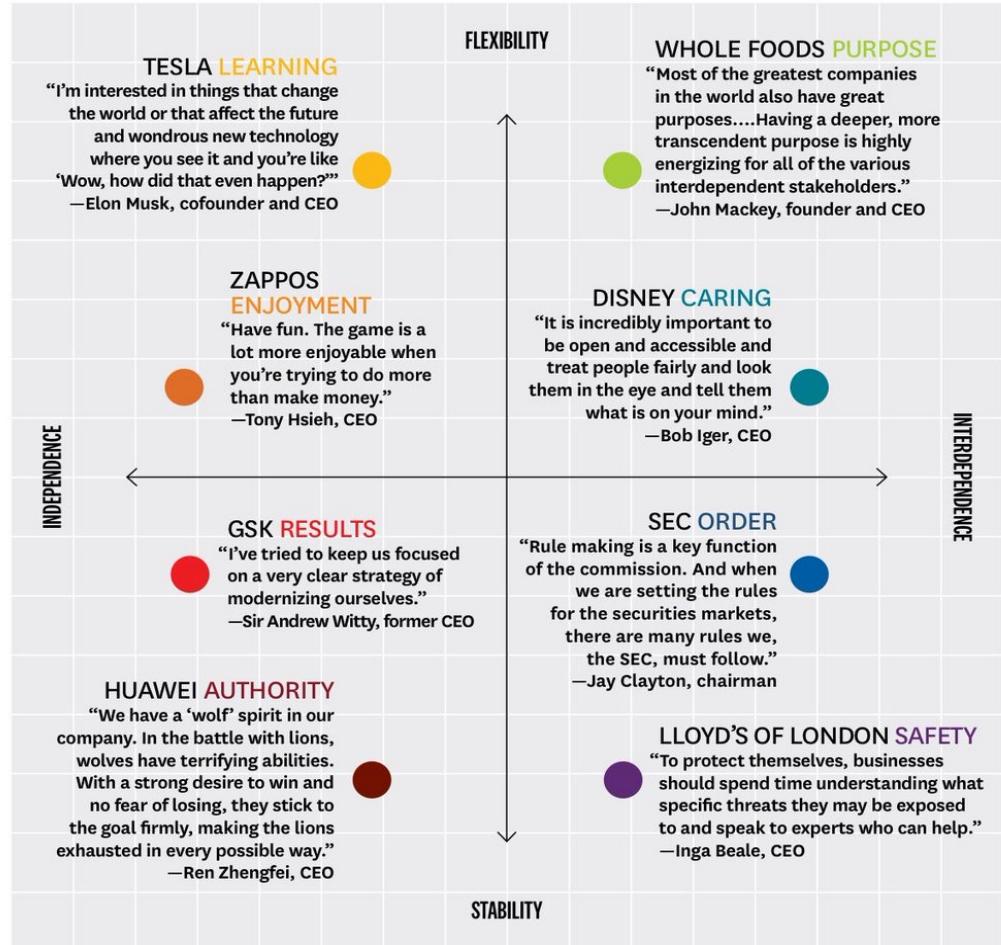
(Daft et al., 2020)



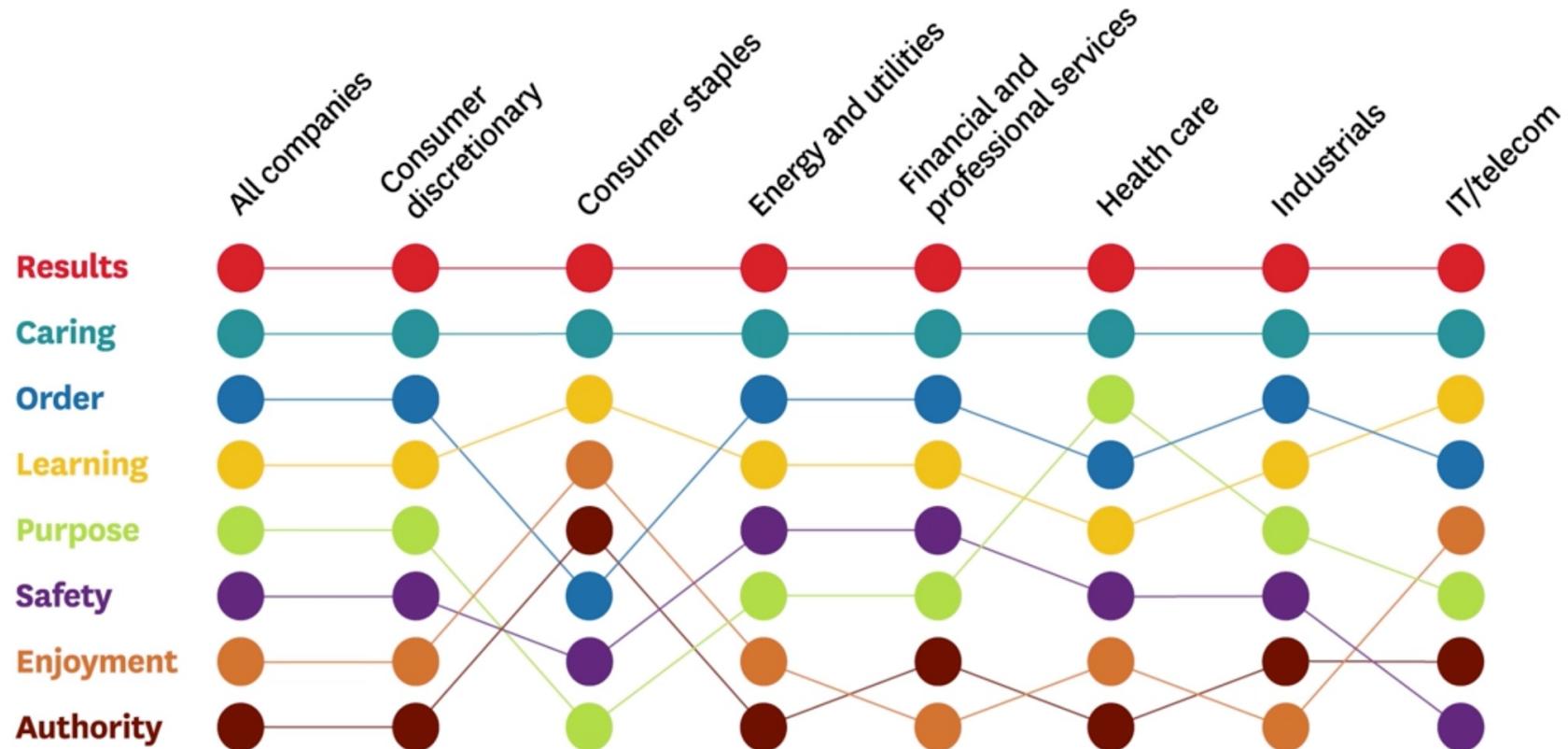
# Types of organizational culture (Groysberg et al., 2018)



# Organizational culture: Leader Statement (Groysberg et al., 2018)



# Culture type & industry



# Culture types Pros & Cons

<b>CARING</b> Warm, sincere, relational	Improved teamwork, engagement, communication, trust, and sense of belonging	Overemphasis on consensus building may reduce exploration of options, stifle competitiveness, and slow decision making	63%	<b>RESULTS</b> Achievement driven, goal focused	Improved execution, external focus, capability building, and goal achievement	Overemphasis on achieving results may lead to communication and collaboration breakdowns and higher levels of stress and anxiety	89%
<b>PURPOSE</b> Purpose driven, idealistic, tolerant	Improved appreciation for diversity, sustainability, and social responsibility	Overemphasis on a long-term purpose and ideals may get in the way of practical and immediate concerns	9%	<b>AUTHORITY</b> Bold, decisive, dominant	Improved speed of decision making and responsiveness to threats or crises	Overemphasis on strong authority and bold decision making may lead to politics, conflict, and a psychologically unsafe work environment	4%
<b>LEARNING</b> Open, inventive, exploring	Improved innovation, agility, and organizational learning	Overemphasis on exploration may lead to a lack of focus and an inability to exploit existing advantages	7%	<b>SAFETY</b> Realistic, careful, prepared	Improved risk management, stability, and business continuity	Overemphasis on standardization and formalization may lead to bureaucracy, inflexibility, and dehumanization of the work environment	8%
<b>ENJOYMENT</b> Playful, instinctive, fun loving	Improved employee morale, engagement, and creativity	Overemphasis on autonomy and engagement may lead to a lack of discipline and create possible compliance or governance issues	2%	<b>ORDER</b> Rule abiding, respectful, cooperative	Improved operational efficiency, reduced conflict, and greater civic-mindedness	Overemphasis on rules and traditions may reduce individualism, stifle creativity, and limit organizational agility	15%

# Identify cultural types





## Microsoft example

*“We will only achieve our mission if we live our culture. We start with becoming **learners in all things**—having a growth mindset. Then we apply that mindset to learning about our customers, **being diverse and inclusive**, working together as one, and—ultimately—**making a difference in the world**”*

# Corporate culture & Performance

The difference in results over an eleven year period between twelve companies that did and twenty companies that did not have this sort of culture (*Corporate Culture and Performance, Kotter, 2011*)

	Average Increase for Twelve Firms with Performance-Enhancing Cultures	Average Increase for Twenty Firms without Performance-Enhancing Cultures
Revenue Growth	682%	166%
Employment Growth	282%	36%
Stock Price Growth	901%	74%
Net Income Growth	756%	1%

# Shaping organizational culture

Culture is to be taught so that new members perceive it correctly

- **Values-based leadership** (leaders articulate a vision for organizational values, provide examples of ethical behavior, institutionalize them through speeches, ceremonies, policies, systems etc.)
- **Structure** (e.g., ethics committee, Chief ethics officer, Ethics hotline etc.)
- **Disclosure mechanisms** (whistle-blowing protection)
- **Code of ethics** (steering documents on company's values)
- **Training programmes**



**Luleå University of Technology's values:**

- **Democratic values**
- **Objectivity**
- **Respect for all people's rights and integrity**



## Example (Nestle – structures)

- *“Agility and fast communication have always been part of the culture of this company. Achieving those requires fewer levels of hierarchy. I personally believe the more levels of hierarchy in your company, the more you have a “filtration issue”—where there are so many levels that eventually the message doesn’t reach the top, or it reaches the top but without the intensity needed to make things happen”*

Of the values that make up an organization's culture, **ethical values** are now considered among the most important.

The notion of **social and environmental responsibility** refers to management's obligation to make choices and take action so that the organization contributes to the welfare and interest of all organizational stakeholders (i.e. employees, customers, shareholders, the community, the broader society)





## Example (Amazon - training, ceremonies)

- **CORE** – annual internal conferences on how race impacts corporate life;
- **Global Accessibility Awareness month** – each may Amazon organizes events, technical talks, workshops etc. to showcase best accessibility practices;
- **Mentorship programs**
- **Developing leaders** (e.g., training for Black leaders)
- **Awards for female leadership**



## Example (reputational damage)

In 2021 women at video game company Activision Blizzard reported regular episodes of humiliation, harassment, systematic underpayment and physical abuse.

Shares of the company have plunged nearly 15% since the lawsuit. Around **10 billion dollars in market value lost**.

The company's president and head of HR stepped down. Jen Oneal is a new co-leader.



# WHY GENDER DIVERSE REPRESENTATION IN ORGANIZATIONS?

# Why gender diverse representation in organizations?

Two perspectives argued for in research for why gender diverse representation in organizations is relevant (Campbell & Mínguez-Vera, 2008; Martin et al., 2008; Guzman & Kacperczyk, 2019)

## The ethical-moral perspective:

*Why it matters:* Ensures fairness and equal opportunities in society.

*How it helps organizations:* Distributes influence and power equitably.

## The efficiency perspective:

*Why it matters:* Taps into unexplored talents for economic growth.

*How it helps organizations:* Avoids neglecting potential competence, boosting overall efficiency.

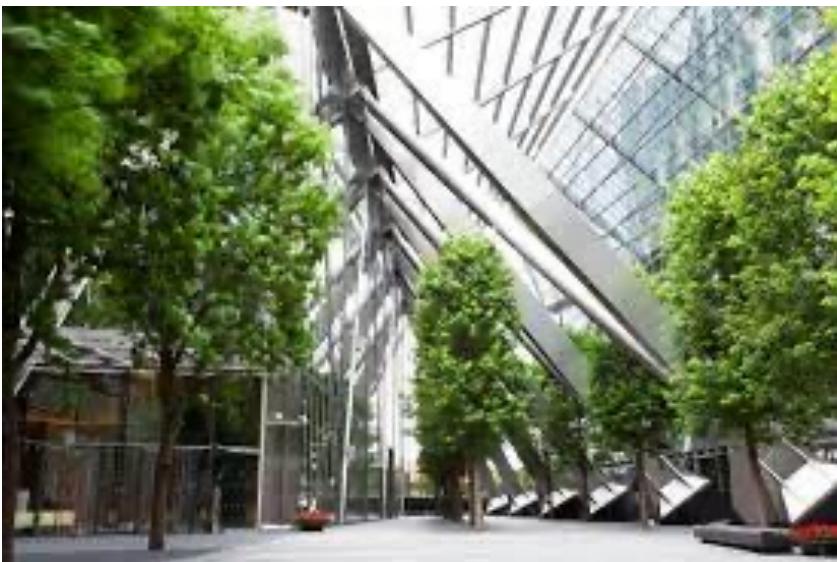
Both perspective motivates a gender diverse representation and explains challenges and losses with unequal gender representation.



# Recruitment and gender diversity

- **Women Apply:** Meet all job requirements.
- **Men Apply:** Meet 60% of qualifications.
- **Clear Descriptions:** Encourage qualified women, don't discourage men.
- **Avoid Superlatives:** Discourage women from applying.
- **Masculine Characteristics:** In job ads can discourage women.
- **Gendered Characteristics:** Common in ads for male and female-dominated positions.





Senior Lead Project Costing  
H2 Green Steel · Norrbotten, Sweden (On-site)

...

Apply

Save

## About the job

*Research shows that women and other under-represented groups within our industry hesitate to apply unless they tick most boxes of a role description. At H2 Green Steel, we are building an impact company with sustainability at its core. We need a diverse, inclusive, and authentic team to rally behind our purpose of de-carbonizing hard-to-abate industries, starting with steel.*

*So, if you are equally passionate about our purpose yet concerned that your experience doesn't perfectly align with the qualifications stated in the job advert, we strongly encourage you to apply anyway. You may be just the right candidate, either for this role – or for another upcoming role in our rapidly growing business.*

Senior Lead Project Costing

OF TECHNOLOGY

# Summarize

- Technology influence's organizational structure
- New flexible manufacturing systems are having a significant impact upon organization design
- IT systems and how they influence organizational design.
- Organizational culture
  - structure, routines and practices, dress code, industrial variations
- Diversity and inclusion

# CASE REVIEW





# Netflix

- **What observable elements of culture can you identify on the Netflix example (e.g., language, symbols, structural choices etc.)?**
  - **What are the benefits of their approach? What are the key challenges**
- 



## Reflection

- Summarize your most interesting conclusions
- Feel free to raise questions, share ideas etc.

# COMING NEXT



# Multiple Choice Test

- Following this class – a multiple choice test will be made available for you to complete on canvas. Time limit – 2 working days (see Canvas)

## Preparatory Reading

- Next session with Elizaveta on Managing Change & Innovation
- Check Canvas for reading instructions

## Final Exam

- January 13th

# Q&A

# THANK YOU!





# Teacher

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# References

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