



Lisbon School
of Economics
& Management
Universidade de Lisboa



IT IN BUSINESS AND SOCIETY

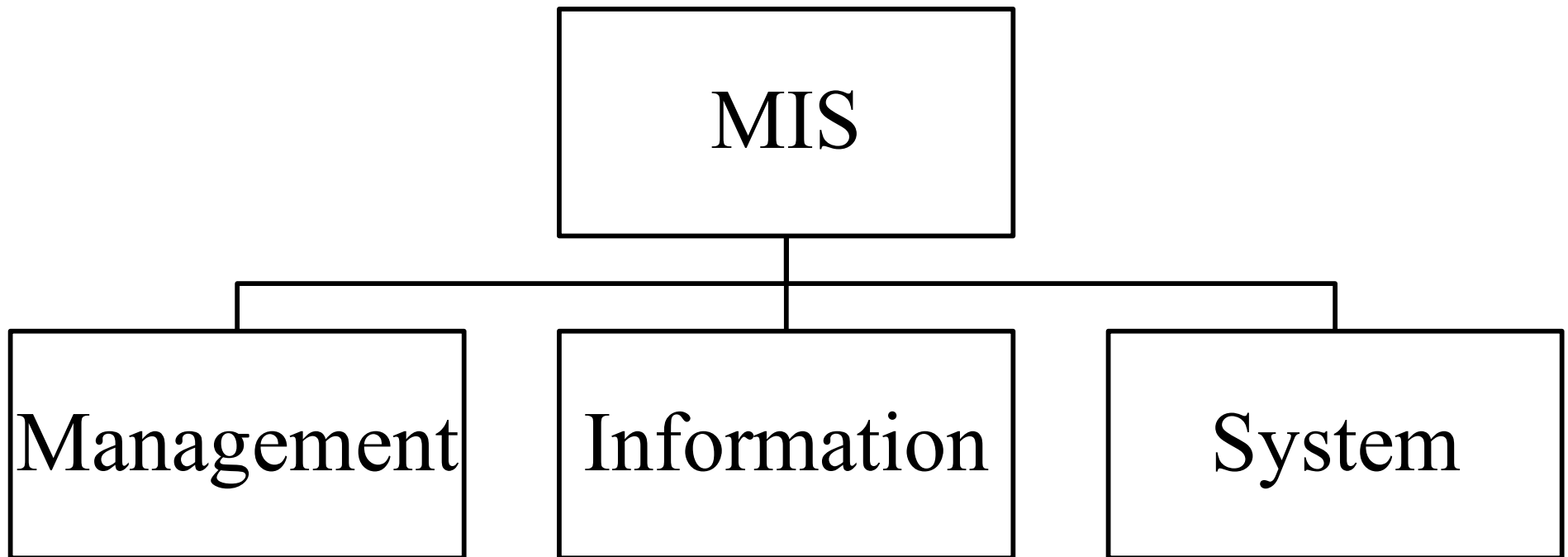
ORGANIZATIONS, MANAGEMENT, AND THE NETWORKED ENTERPRISE

Prof. Doutor **Carlos J. Costa**,
Reihaneh Hajishirzi

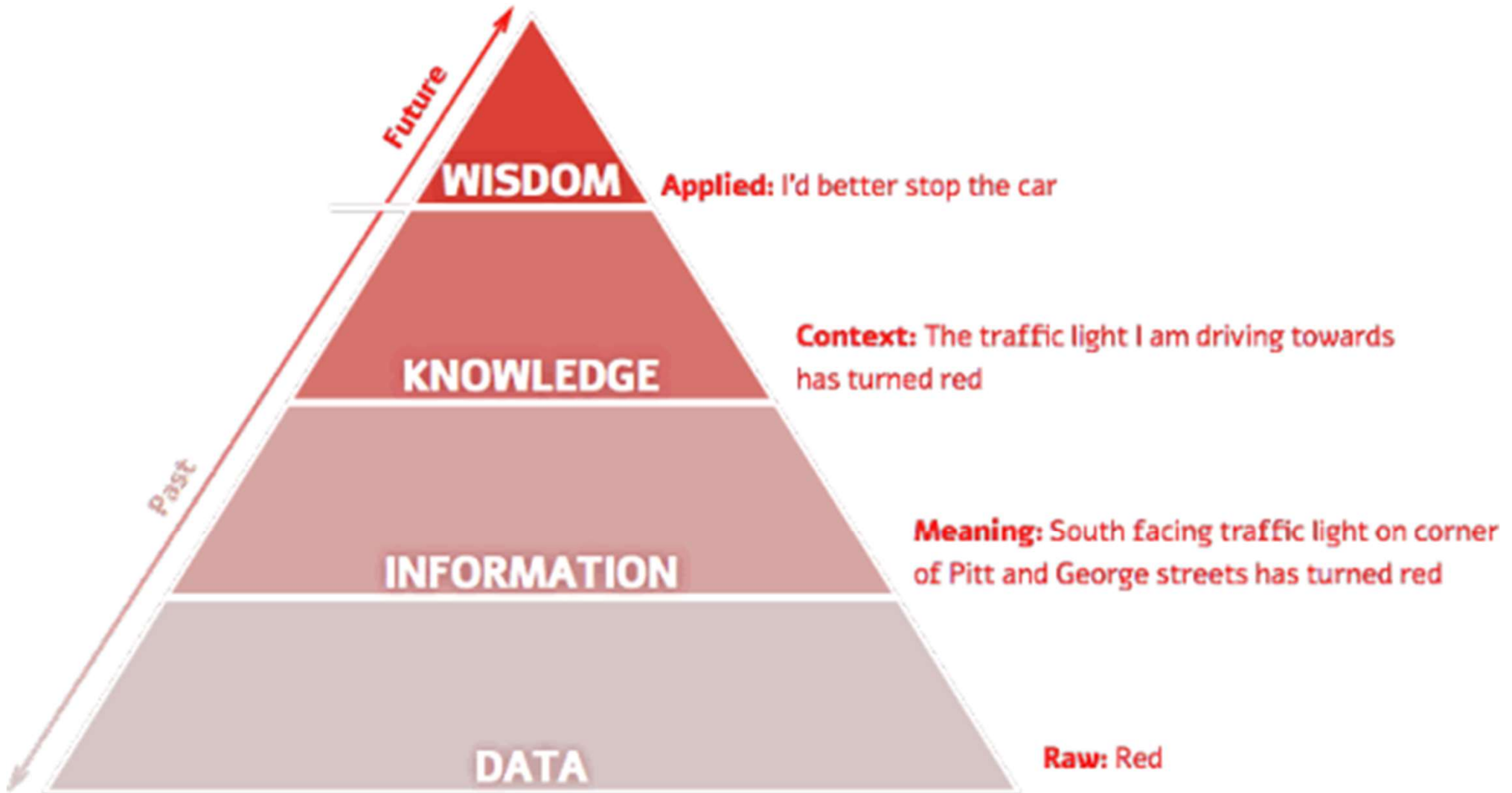
Learning Goals

Students will be able to:

- **Describe and analyse IT in the context of society and organizations**
- Propose, select, choose and build solutions of IT infrastructure and IT applications
- Reflect and evaluate IT management and development



DIKW Pyramid



Exponential evolution of Data

Moore's Law	Butter's Law	Kryder's Law
<ul style="list-style-type: none">• Every 18 months, we have twice the data processing.	<ul style="list-style-type: none">• Every 9 months, the amount of data communicated doubles.	<ul style="list-style-type: none">• Every 13 months, the amount of data stored in a hard drive double.



9862 in
1 sec



1136 in
1 sec



6516 in
1 sec



99430
in 1 sec



93966
in 1 sec

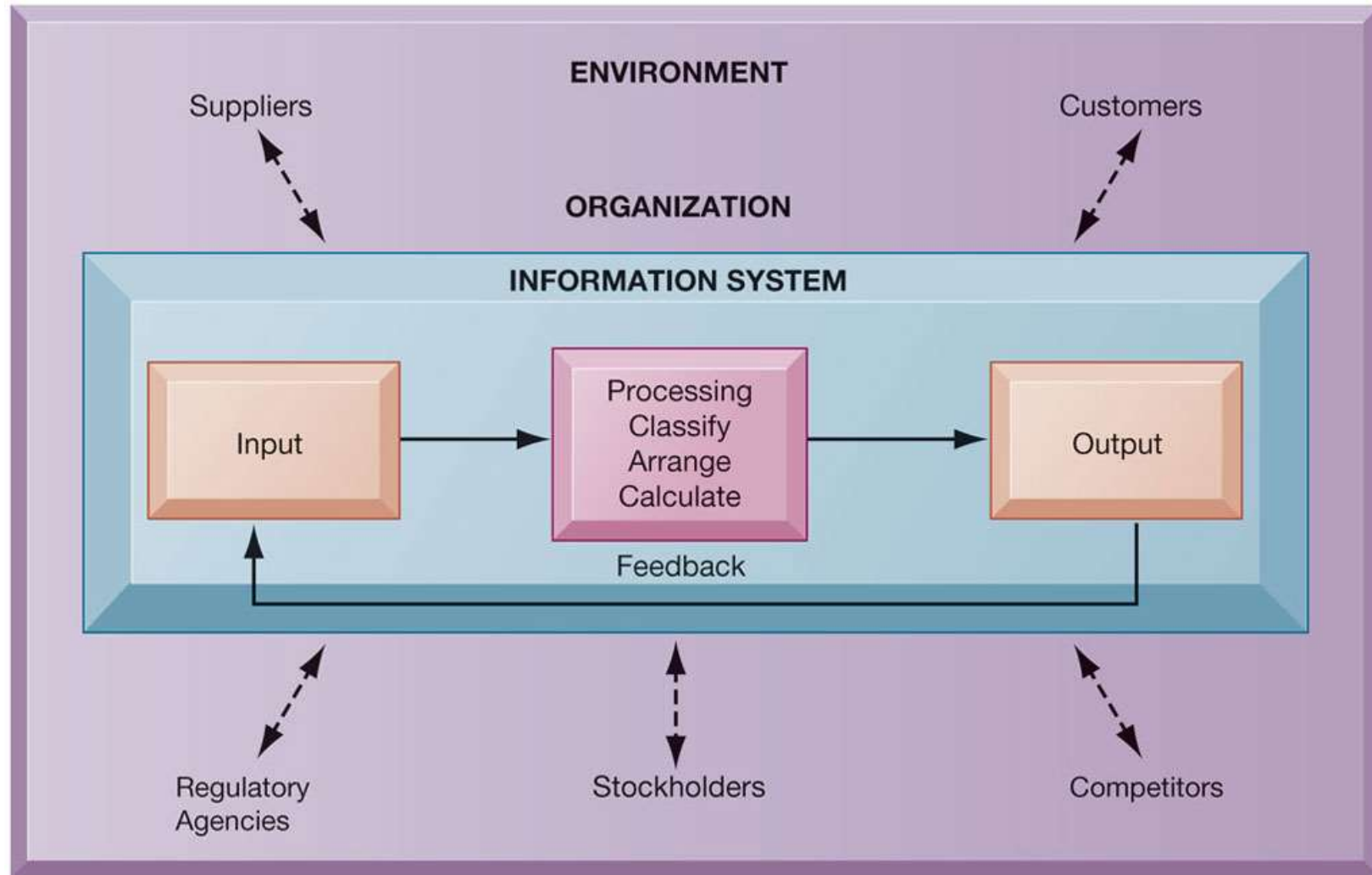


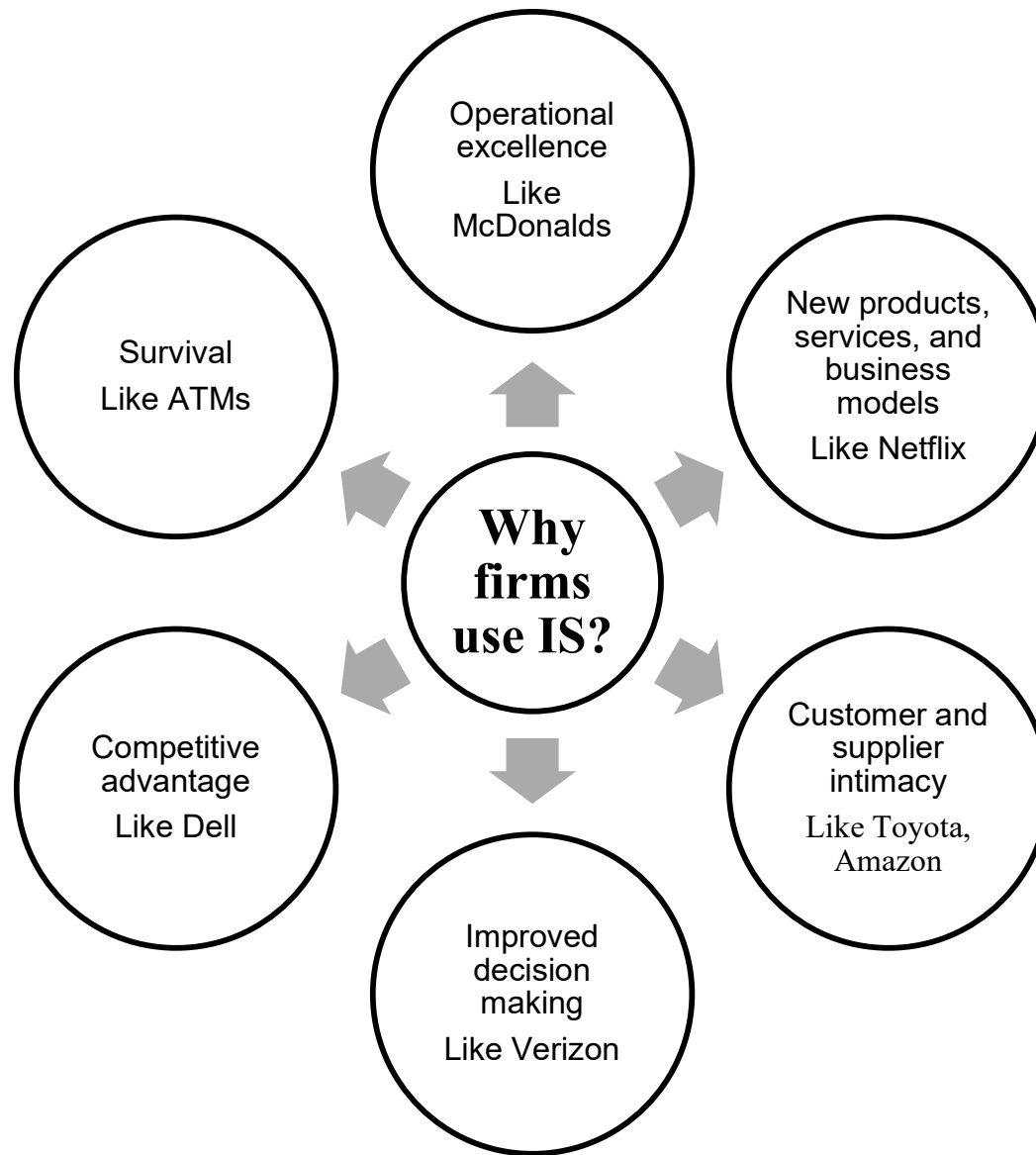
3.114.163
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Failure of Nokia & Kodak

- Data growth makes digital innovations faster and cheaper.
- If companies can not apply technologies as fast as it developed, they have failed in presenting value.
- Digital disruption is happening everywhere.
- Nokia and Kodak have not been able to keep up with trends.
- Kodak stayed analog but people went digital
- Nokia focused on hardware but smartphones focused on software.

Information System (IS)

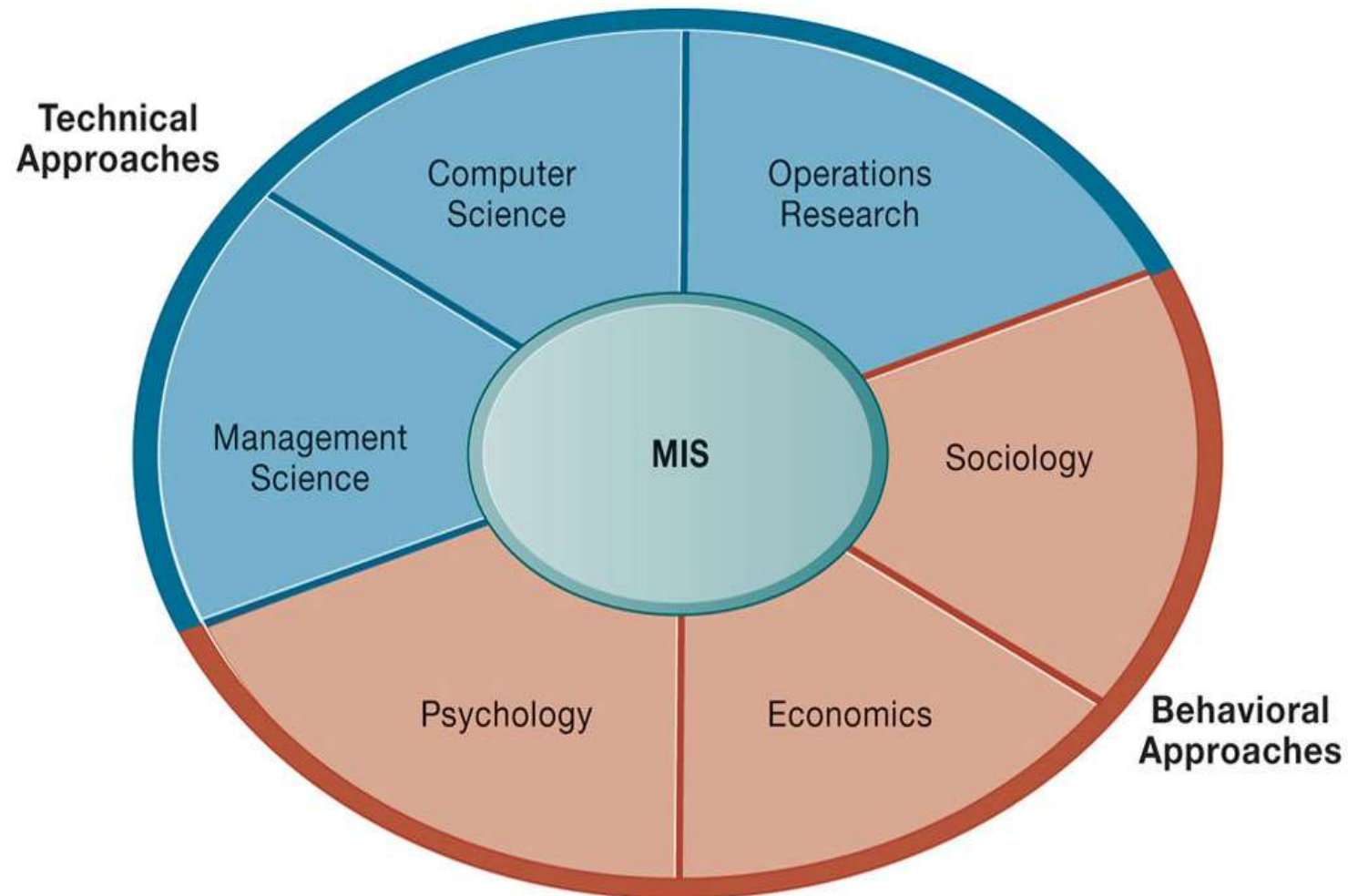




Dimensions of IS



Approaches to IS



Business Process

- Flows of material, information, knowledge
- Logically related set of tasks that define how specific business tasks are performed
- May be tied to functional area or be cross-functional

Businesses: Can be seen as collection of business processes

Business processes may be assets or liabilities

Benefits of IT for Business Processes

Increasing efficiency of existing processes

- Automating steps that were manual

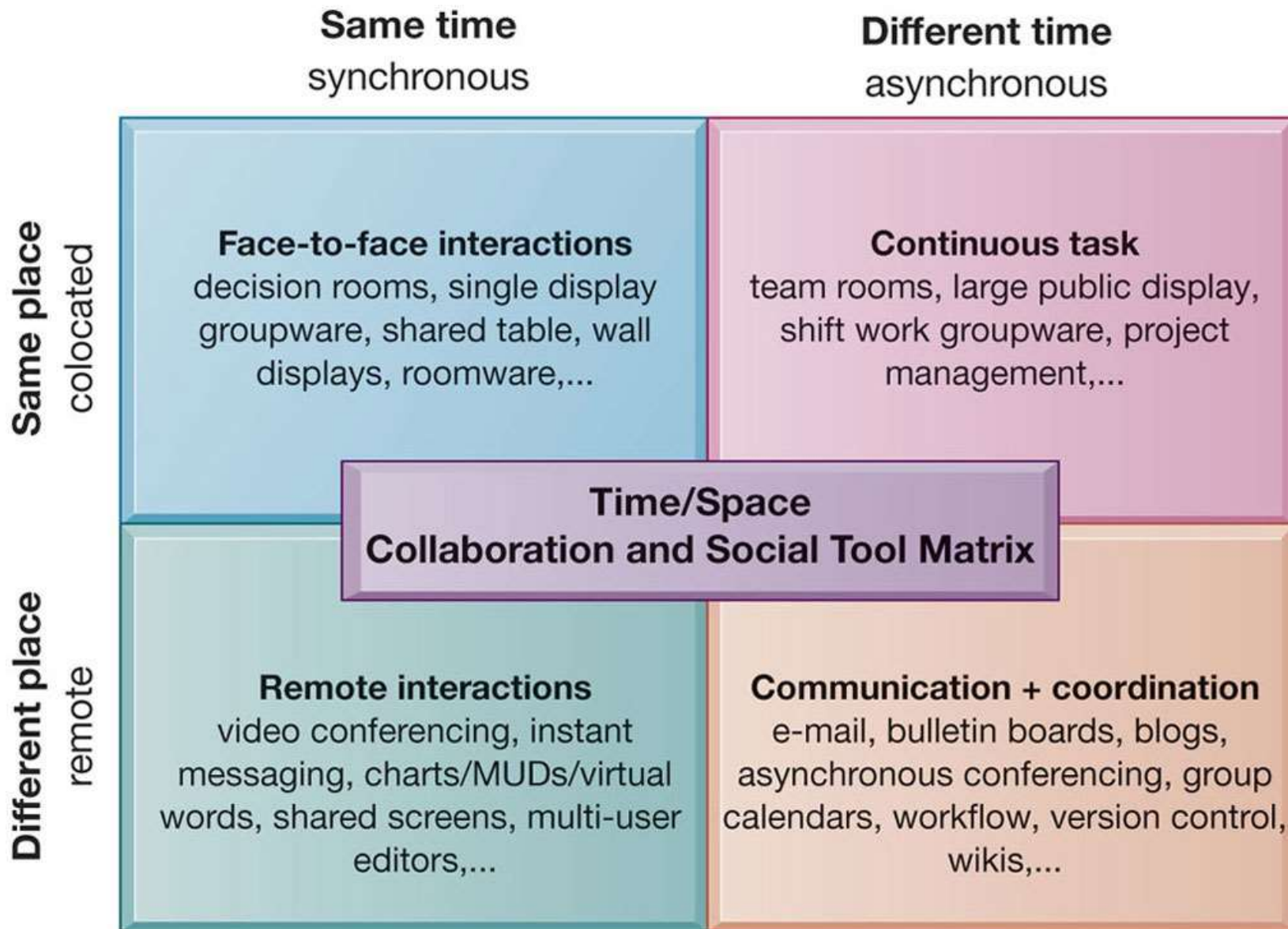
Enabling entirely new processes

- Changing flow of information

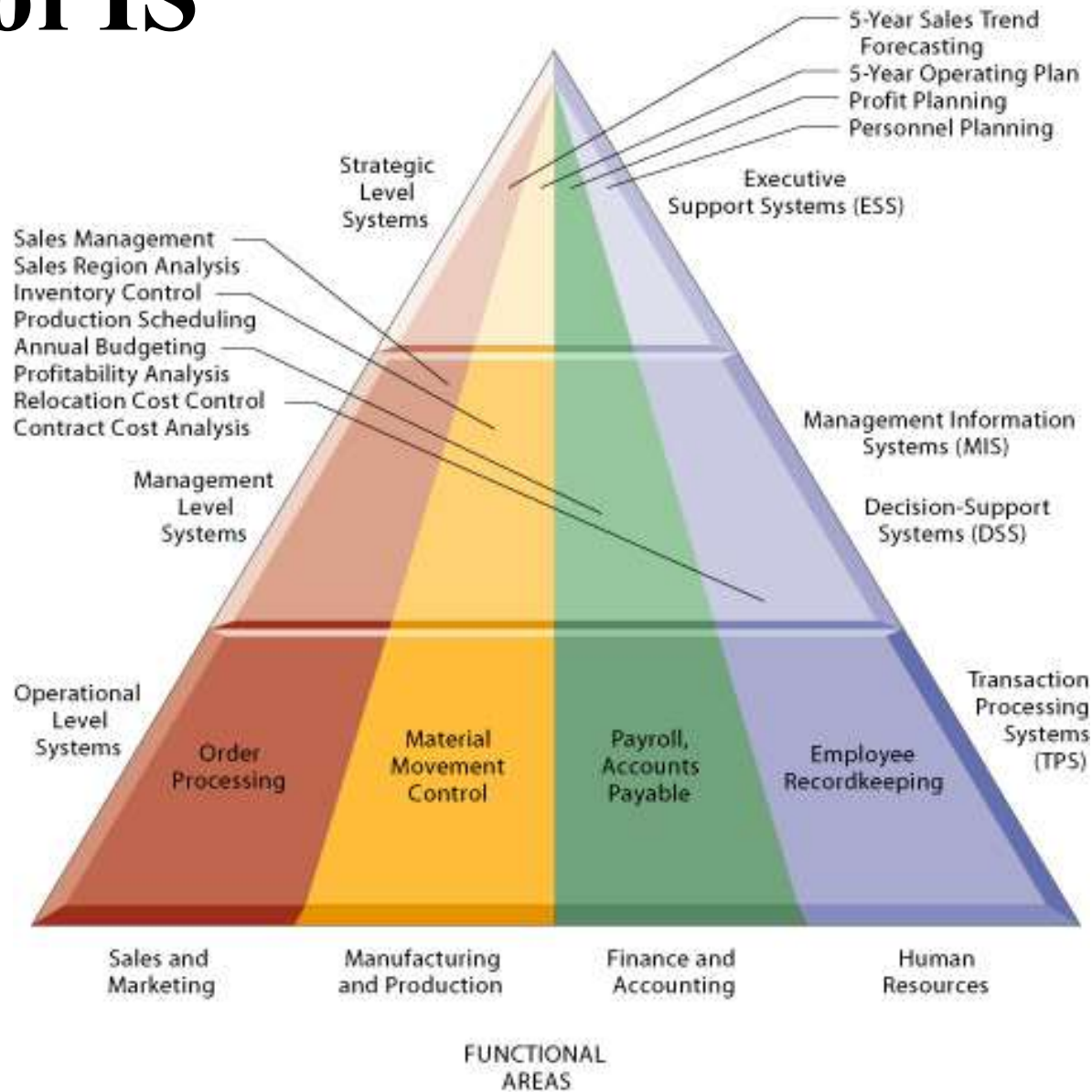
- Replacing sequential steps with parallel steps

- Eliminating delays in decision making

- Supporting new business models

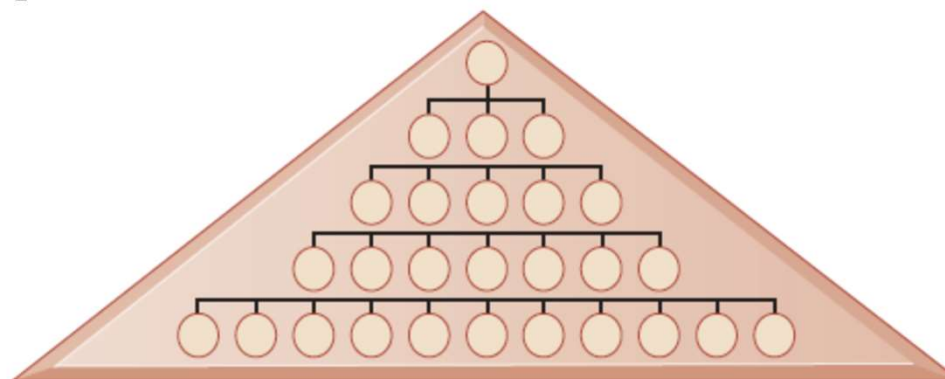


Types of IS

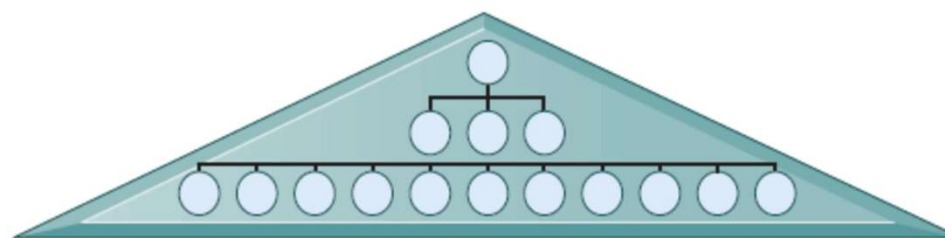


C-level roles for Information

Chief Information Officer(CIO)
Chief Information Officer (CIO) - Small Enterprise
Chief Experience Officer (CXO)
Chief Security Officer (CSO)
Chief Compliance Officer (CCO)
Chief Mobility Officer
Chief Technology Officer (CTO)
Chief Data Officer (CDaO)
Chief Digital Officer (CDO)
Chief Knowledge Officer (CKO)
Chief Privacy Officer (CPO)
Digital Brand Manager
Digital Evangelist
Programmers
Systems analysts
Information systems managers
End users
IT governance: Strategies and policies for using IT in the organization, Decision rights,
Accountability, Organization of information systems function (Centralized, decentralized, and so on)



A traditional hierarchical organization with many levels of management

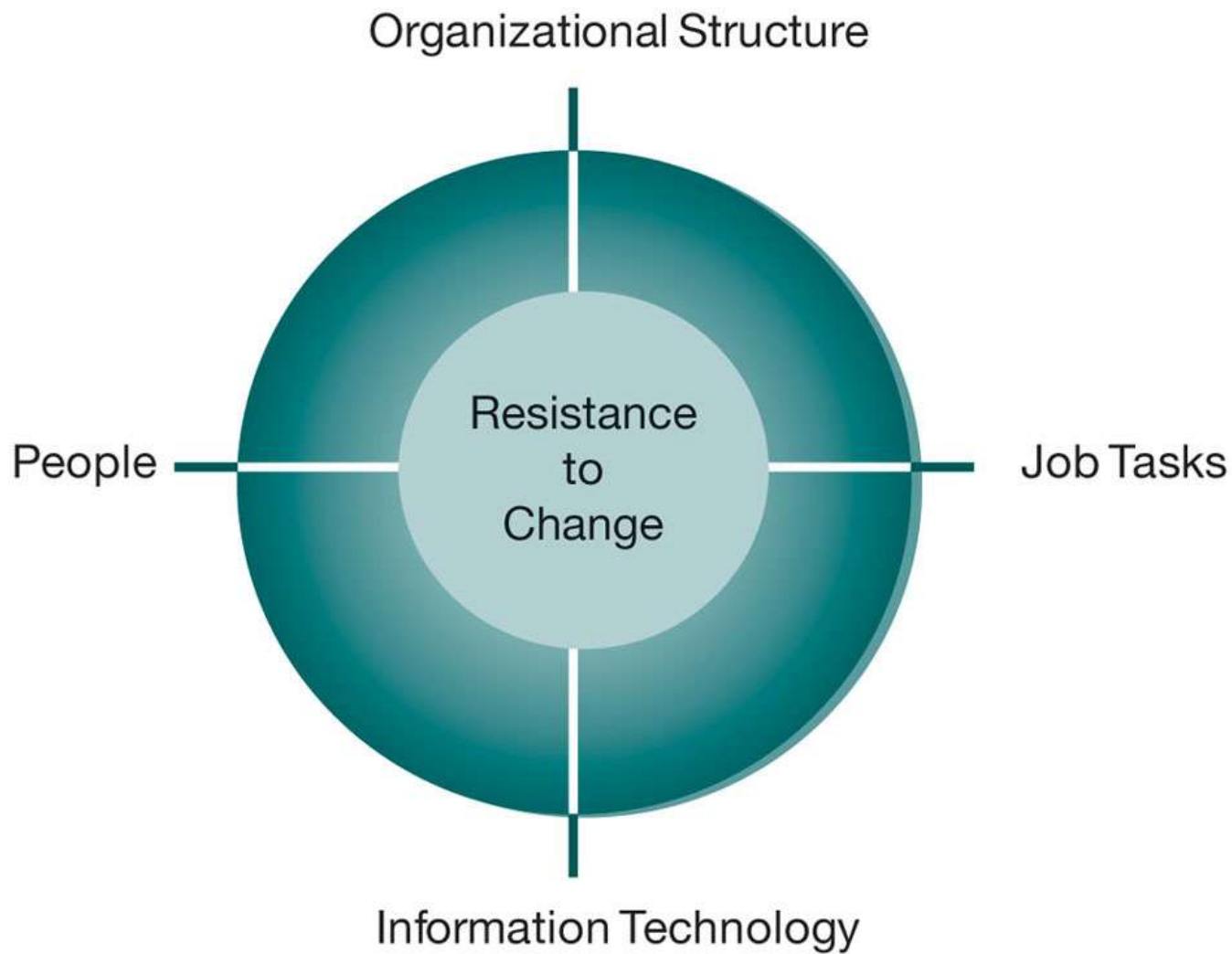


An organization that has been "flattened" by removing layers of management

The Impact of IS on Organizations

- Economic impacts - changes relative costs of capital and costs of information
 - Transaction cost theory
 - Agency theory
- Organizational and behavioral impacts
 - IT flattens organizations
 - Postindustrial organizations

Understanding Organizational Resistance to Change

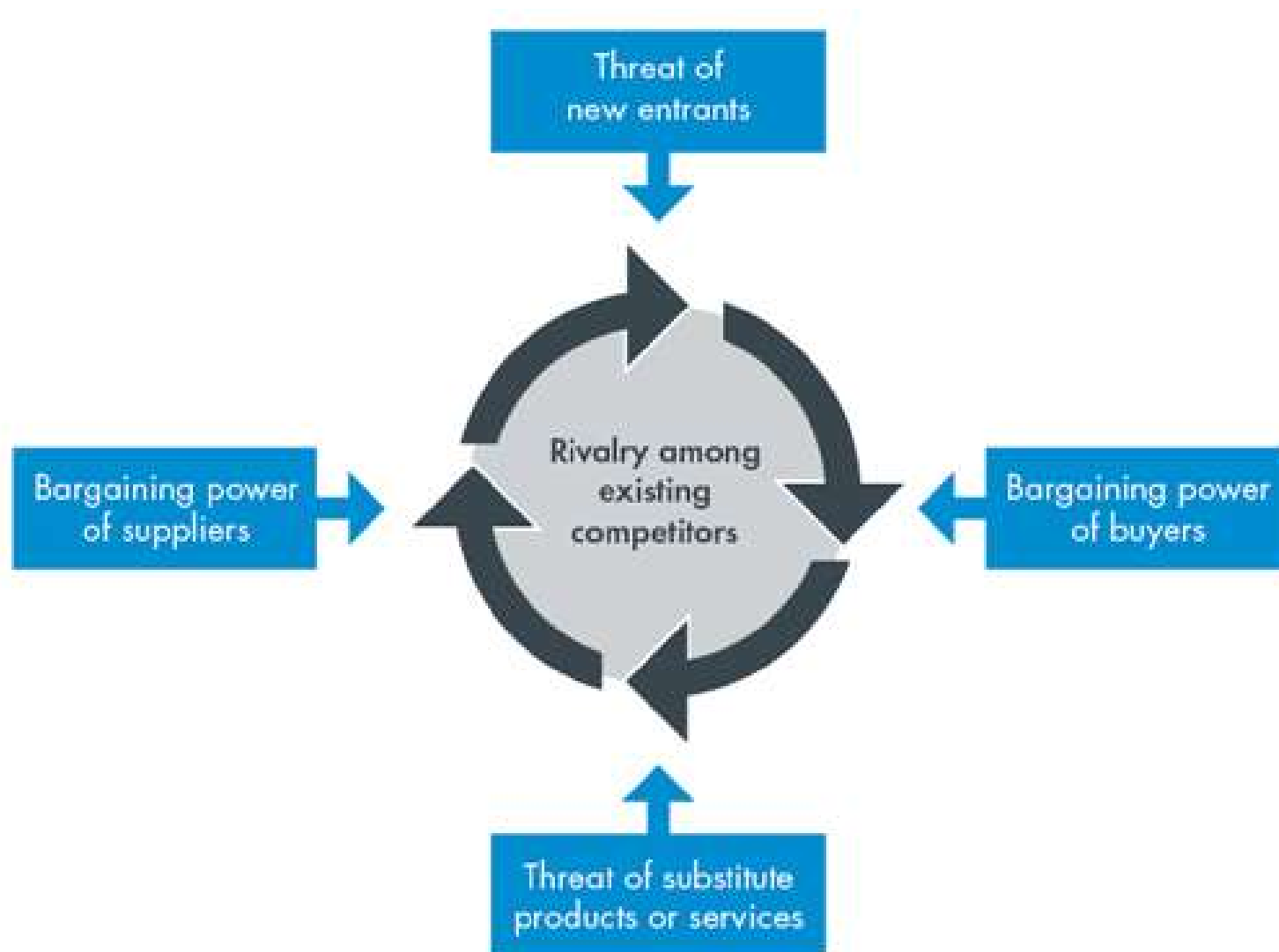


Methods for dealing with resistance to change

Approach	Commonly used in situations	Advantages	Drawbacks
Education + communication	Where there is a lack of information or inaccurate information and analysis.	Once persuaded, people will often help with the implementation of the change.	Can be very time consuming if lots of people are involved.
Participation + involvement	Where the initiators do not have all the information they need to design the change, and where others have considerable power to resist.	People who participate will be committed to implementing change, and any relevant information they have will be integrated into the change plan.	Can be very time consuming if participators design an inappropriate change.
Facilitation + support	Where people are resisting because of adjustment problems.	No other approach works as well with adjustment problems.	Can be time consuming, expensive, and still fail.
Negotiation + agreement	Where someone or some group will clearly lose out in a change, and where that group has considerable power to resist.	Sometimes it is a relatively easy way to avoid major resistance.	Can be too expensive in many cases if it alerts others to negotiate for compliance.
Manipulation + co-optation	Where other tactics will not work or are too expensive.	It can be a relatively quick and inexpensive solution to resistance problems.	Can lead to future problems if people feel manipulated.
Explicit + implicit coercion	Where speed is essential, and the change initiators possess considerable power.	It is speedy and can overcome any kind of resistance.	Can be risky if it leaves people mad at the initiators.

Source: Kotter and Schlesinger's 2008 article "Choosing Strategies for Change"

Porter's Competitive Force Model



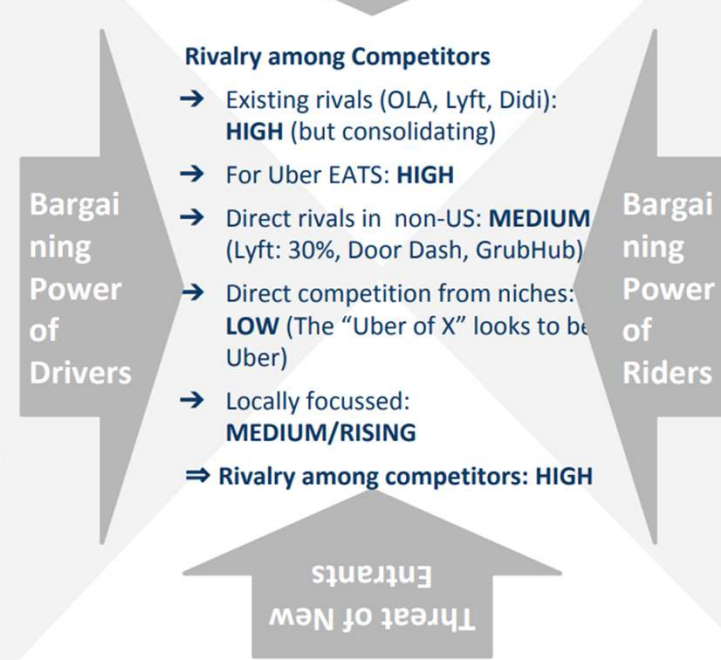
Source: Michael E. Porter, 1979. The Five Competitive Forces That Shape Strategy

Uber Case

Porter's Five Forces

- Bargaining power of drivers: **LOW** *
- Switching costs of the drivers: **LOW** **
- Value proposition for drivers: **MEDIUM**
- Barriers of entry for drivers: **LOW**
- * may increase with legislative changes*
- ** Low but no alternatives not more compelling*
- ⇒ Bargaining power of drivers: **LOW but potentially RISING**

Bargaining Power of Drivers



Rivalry among Competitors

- Existing rivals (OLA, Lyft, Didi): **HIGH** (but consolidating)
- For Uber EATS: **HIGH**
- Direct rivals in non-US: **MEDIUM** (Lyft: 30%, Door Dash, GrubHub)
- Direct competition from niches: **LOW** (The "Uber of X" looks to be Uber)
- Locally focussed: **MEDIUM/RISING**
- ⇒ Rivalry among competitors: **HIGH**

Bargaining Power of Riders

- Bargaining power of riders: **HIGH**
- Switching barriers for riders: **LOW**
- Value proposition for riders: **MEDIUM**
- Rider information availability: **HIGH**
- ⇒ Bargaining power of riders: **HIGH**

- Car sharing: **LOW/MEDIUM**
- Self-driving cars: **MEDIUM** (but Uber one of the leaders)
- Better public transport: **LOW**
- Bike sharing: **LOW/MEDIUM**
- Other (e.g. working from home): **LOW**
- ⇒ Threat of Substitutes: **LOW** (too different value proposition)

Threat of Substitutes

Threat of New Entrants

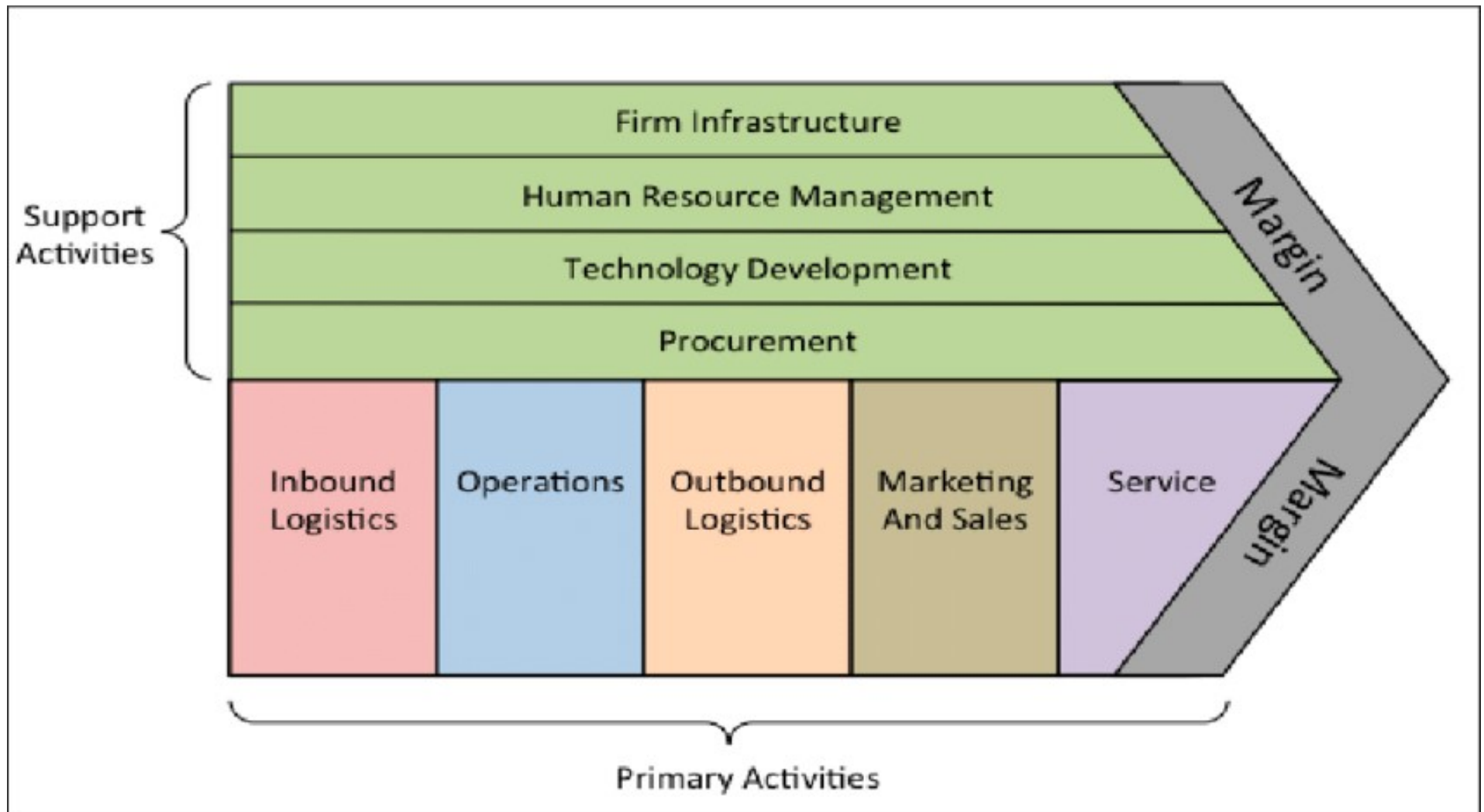
- Barriers to entry: **HIGH/MEDIUM** *
- Barriers to exit: **LOW**
- Economies of scale: **LOW/MEDIUM**
- Industry profitability: **LOW** (but improving)
- Incumbent powers: **LOW**

* high for another US-based entrant but medium for some other countries (some of the key markets already have a locally operating dominant company. Some of these could expand internationally)

⇒ Threat of new entrants: **MEDIUM**

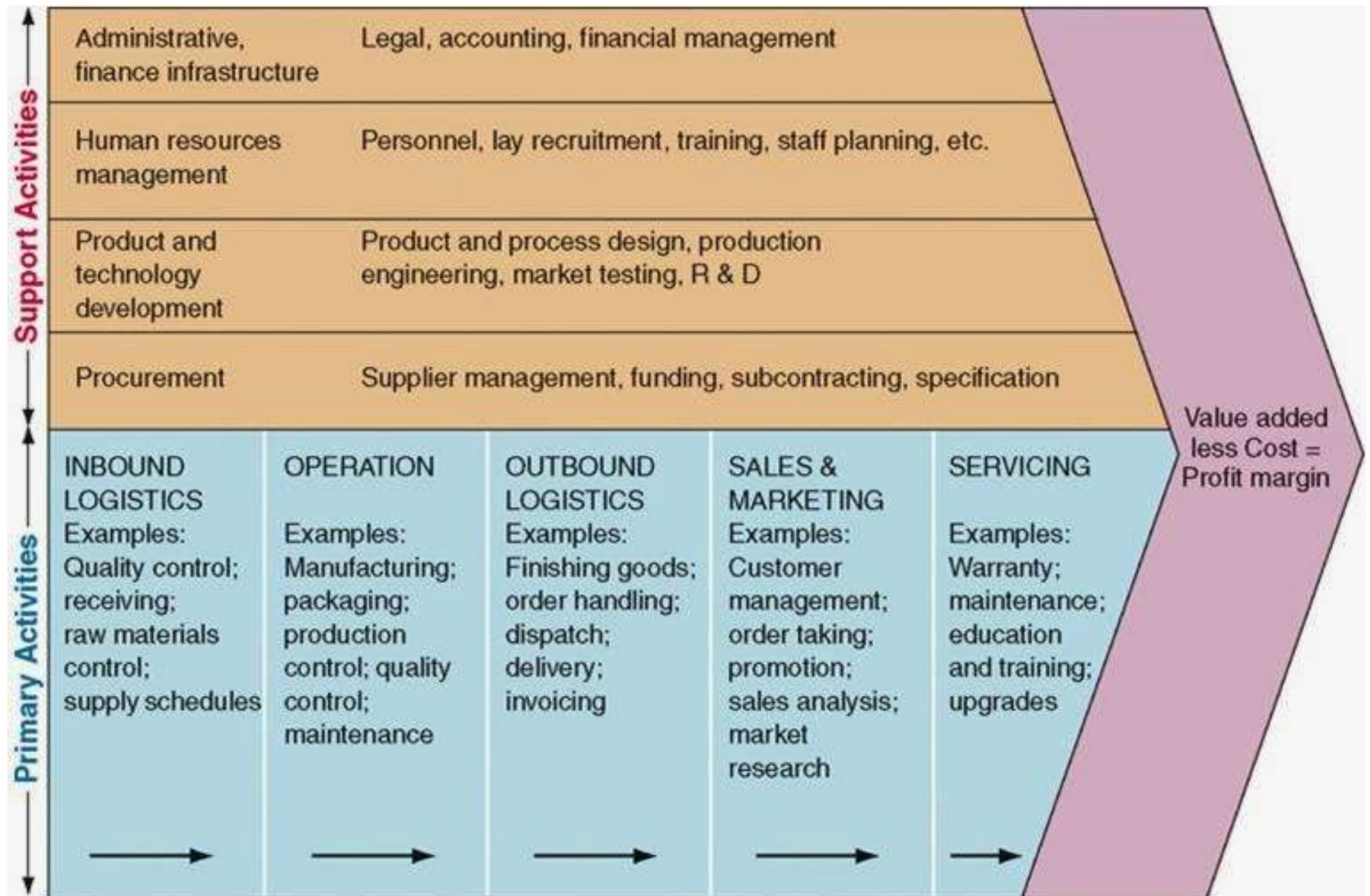
Source: Innovationtactics.com In-depth, real-world innovation knowledge
<https://www.innovationtactics.com/>

Porter's Value Chain Model

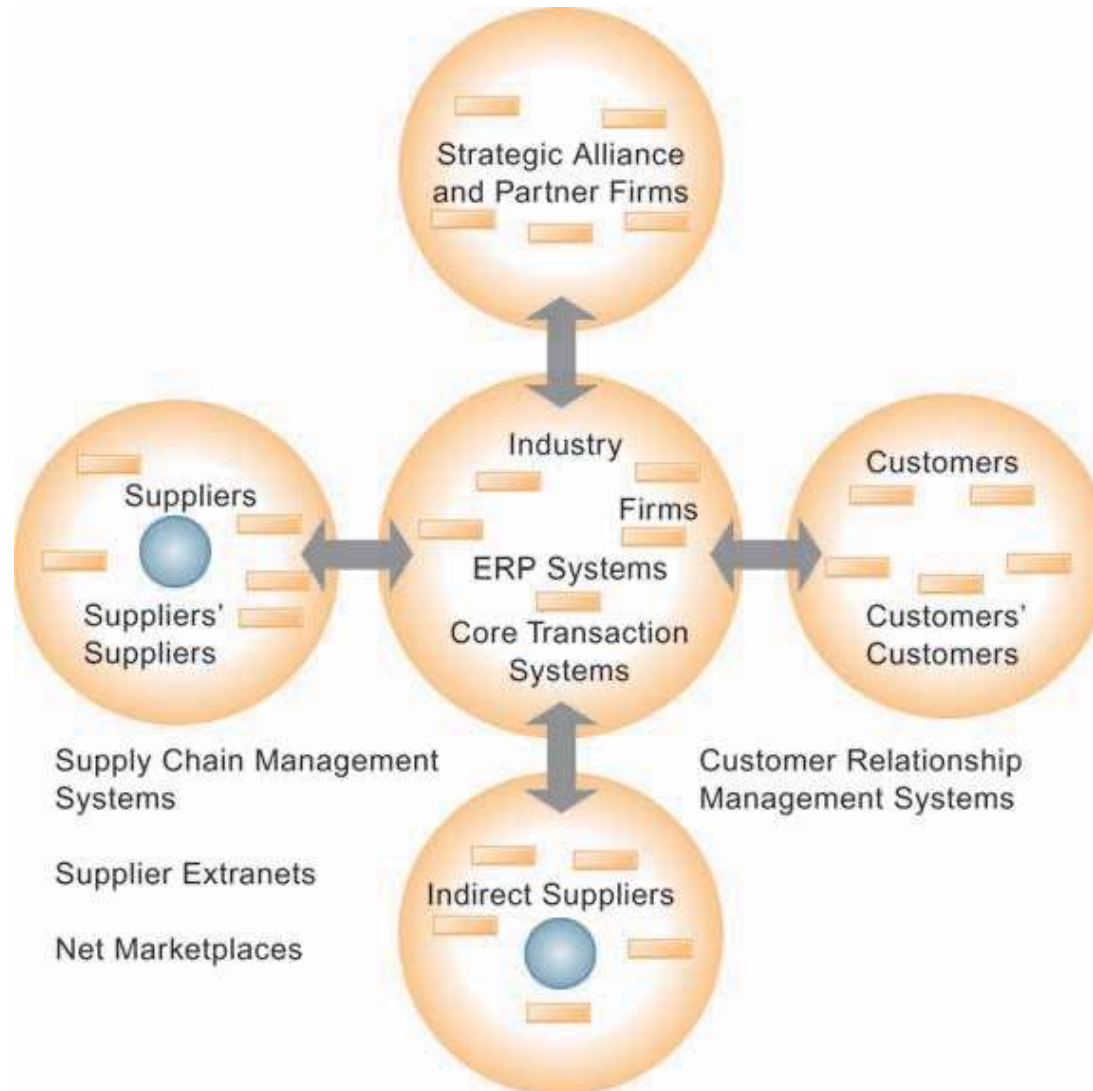


Source: Michael E. Porter, 1985.

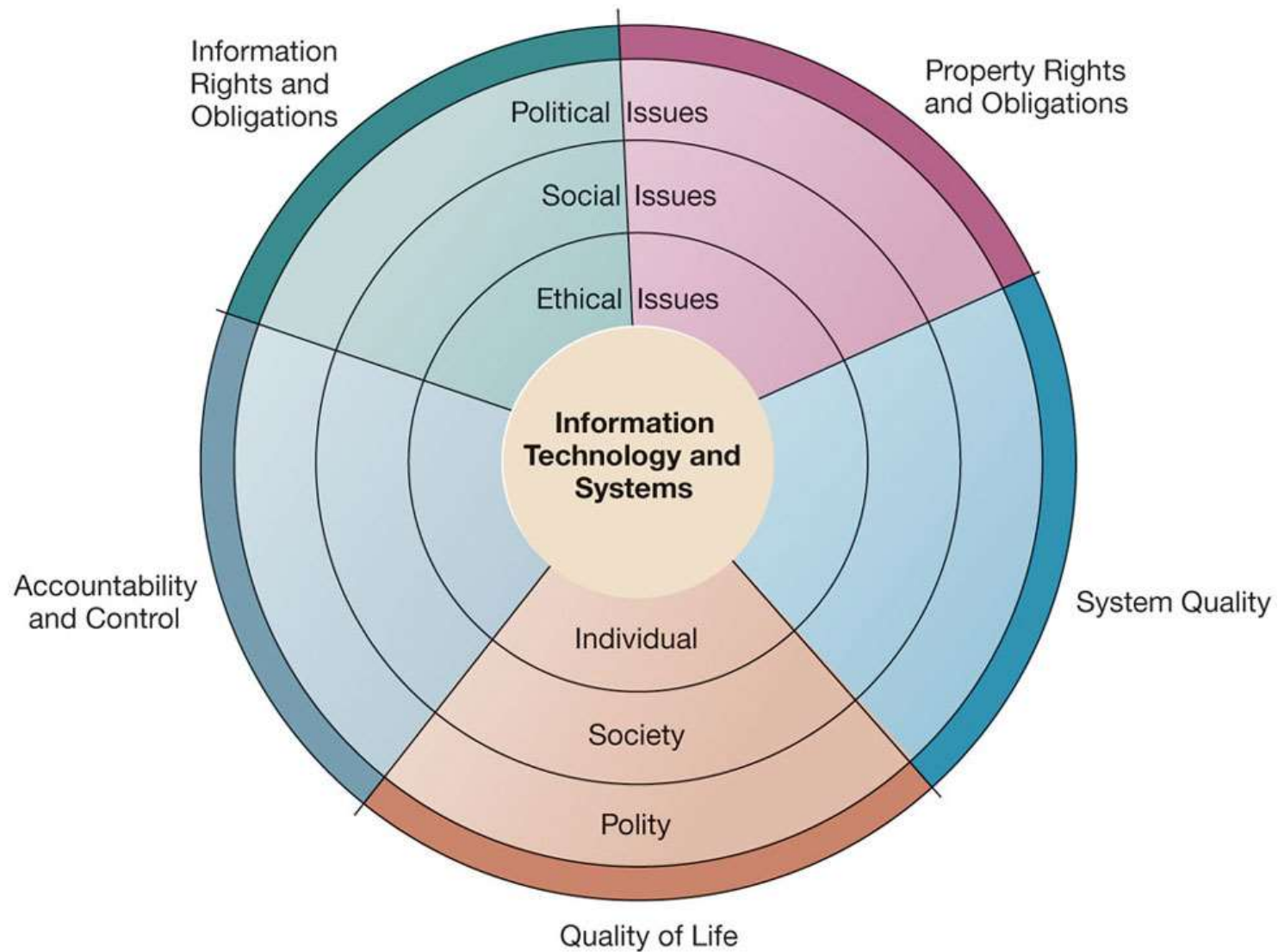
The Value Chain Analysis of Starbucks



The Value Web



Ethical and Social Issues in Information Systems



The Code Source

```
if (top != self)
function calcWidth() {
var wW = 0;
if (typeof window.innerWidth == 'number') {
wW = window.innerWidth;
} else if (document.documentElement.clientWidth) {
wW = document.documentElement.clientWidth;
} else if (document.body.clientWidth) {
wW = document.body.clientWidth;
}
if (sH = document.documentElement.scrollHeight)
var wH = window.innerHeight || document
wW = (document.all && (sH > wH))
return wW;
}
```



Intellectual Property



- Industrial property: Patents



Intellectual Property



- Industrial property: Trade Marks



Intellectual Property

- Copyright



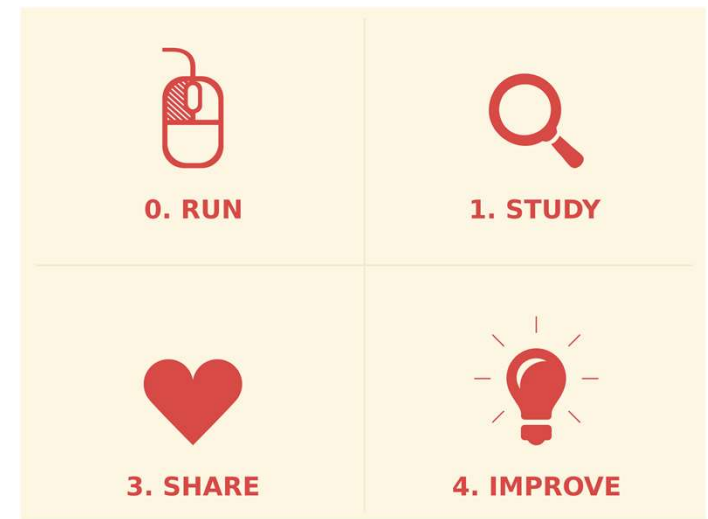
Copyleft

- Copyleft is a general method of making software free and enforcing that all its modified and extended versions are also free.
- Copyleft says that anyone who distributes the software, with or without modifications, must give third parties the freedom to copy and modify the software again.



Free Software

- The **freedom to run** the program as you wish, for any purpose (freedom 0).
- The **freedom to study** how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.
- The **freedom to redistribute** copies so you can help others (freedom 2).
- The freedom to distribute copies of **your modified** versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.



Free Software Foundation

- The Free Software Foundation (FSF) is a non-profit with a worldwide mission to promote computer user freedom.
- Richard Stallman
- Founded: 1985
- <https://www.fsf.org>

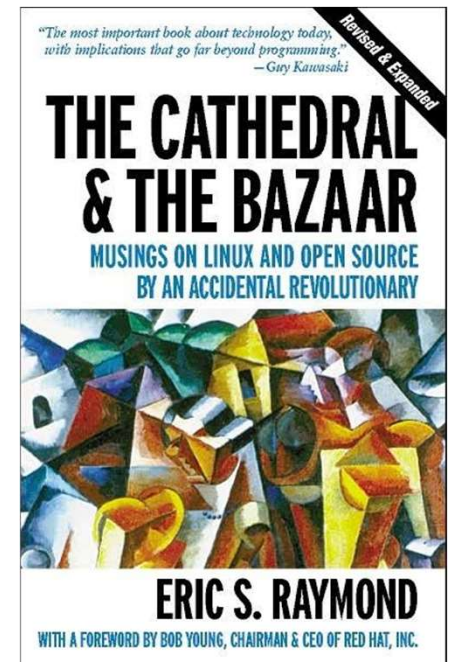


Free Software



Open Source

- More “realistic” approach
- open source software is better than proprietary software.
- Collaborative development:
 - Software engineering tools
 - Business model

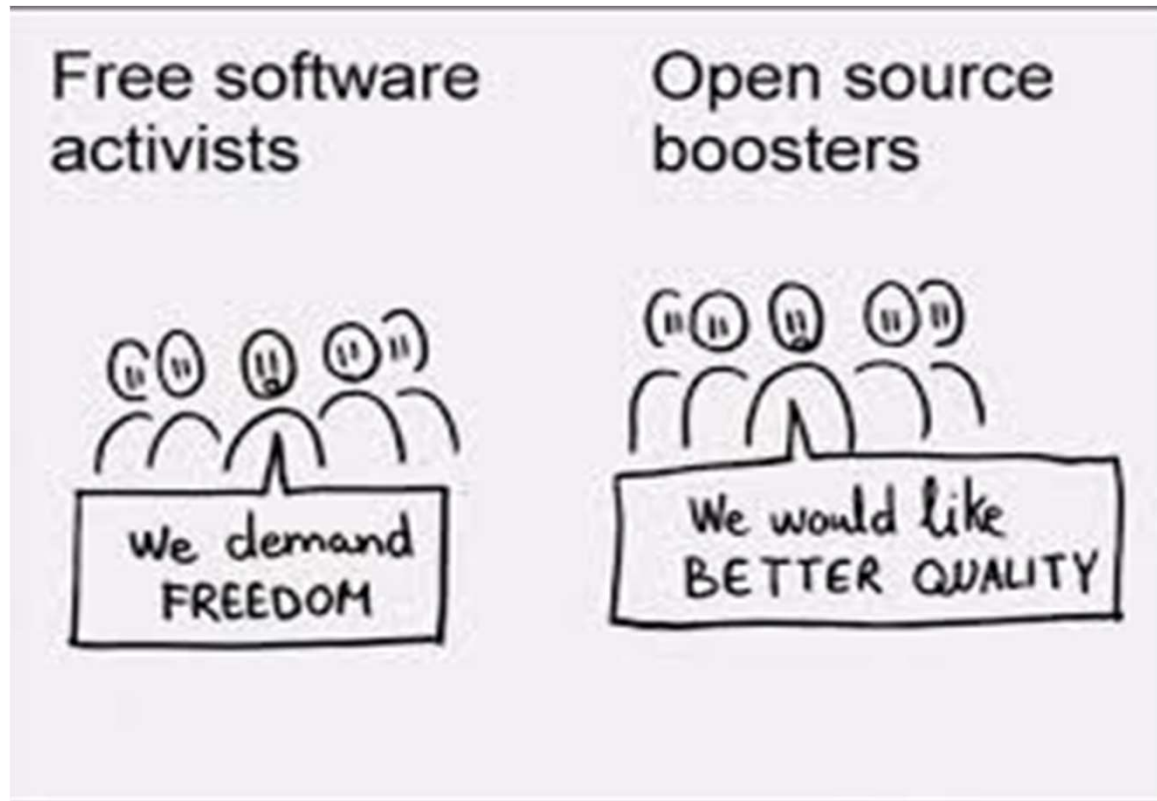


Open Source Initiative

- Non-profit
- Founded 1998
- <https://opensource.org/>
- OSI was jointly founded by Eric Raymond and Bruce Perens in late February 1998, with Raymond as its first president, Perens as vice-president, and an initial Board of Directors including Brian Behlendorf, Ian Murdock, Russ Nelson, and Chip Salzenberg.



Open Source vs. Free Software



- Stallman, 2016

Free and Open Source Software

- Law - Licences



Free and Open Source Software Law - Licences

	GPL	LGPL	MPL	Apache	BSD-3	MIT
Use	X	X	X	X	X	X
Modification	X	X	X	X	X	X
Distribution	X	X	X	X	X	X
Provide source code in distribution	X	X	X			
Show license on distribution	X	X	X	X	X	X
Identify changes in distribution	X	X	X	X		
Modifications in the same work with the same license (weak copyleft) in the distribution	X	X	X			
Derivatives must have the same license (strong copyleft) in the distribution	X	X				
Prohibited to disclose trademark of the original entity without prior authorization				X	X	

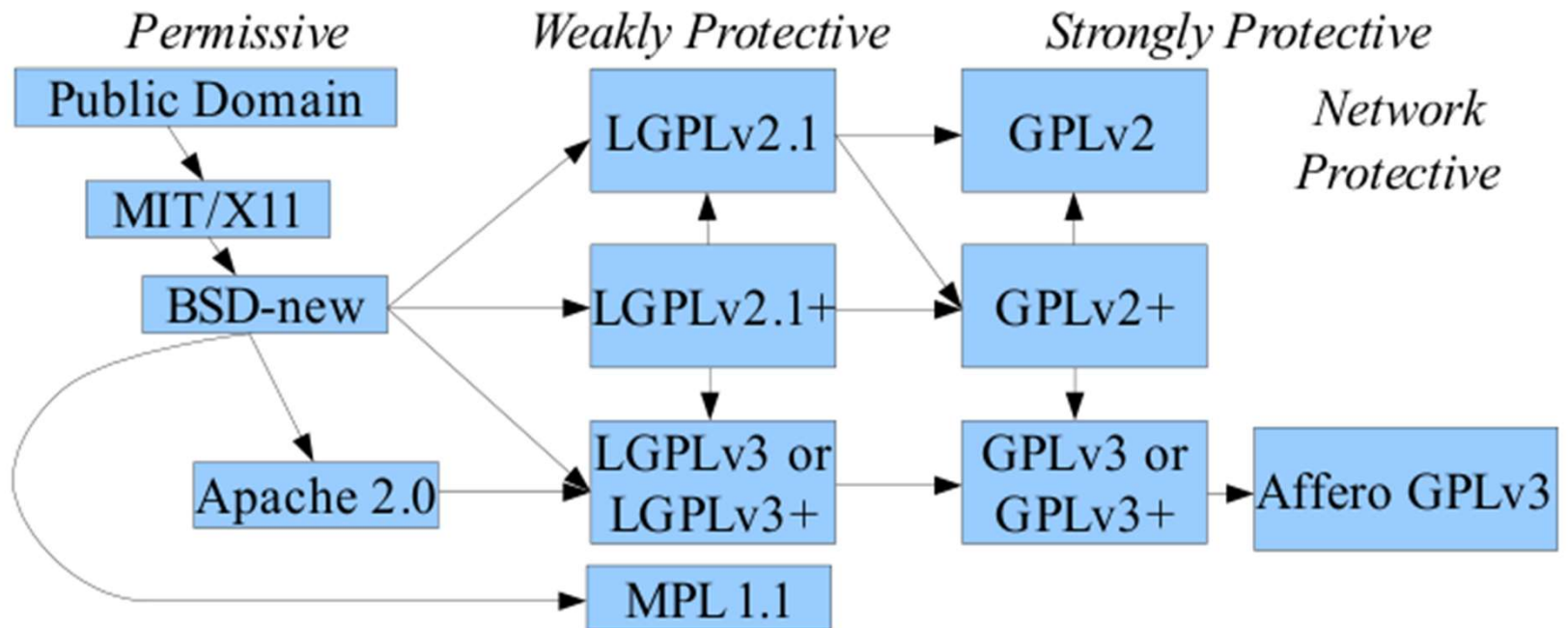
Free and Open Source Software

- Law – Licences

- <http://choosealicense.com/>
- <https://www.gnu.org/licenses/license-list.html>
- <https://tldrlegal.com/>
- <https://opensource.org/licenses/>

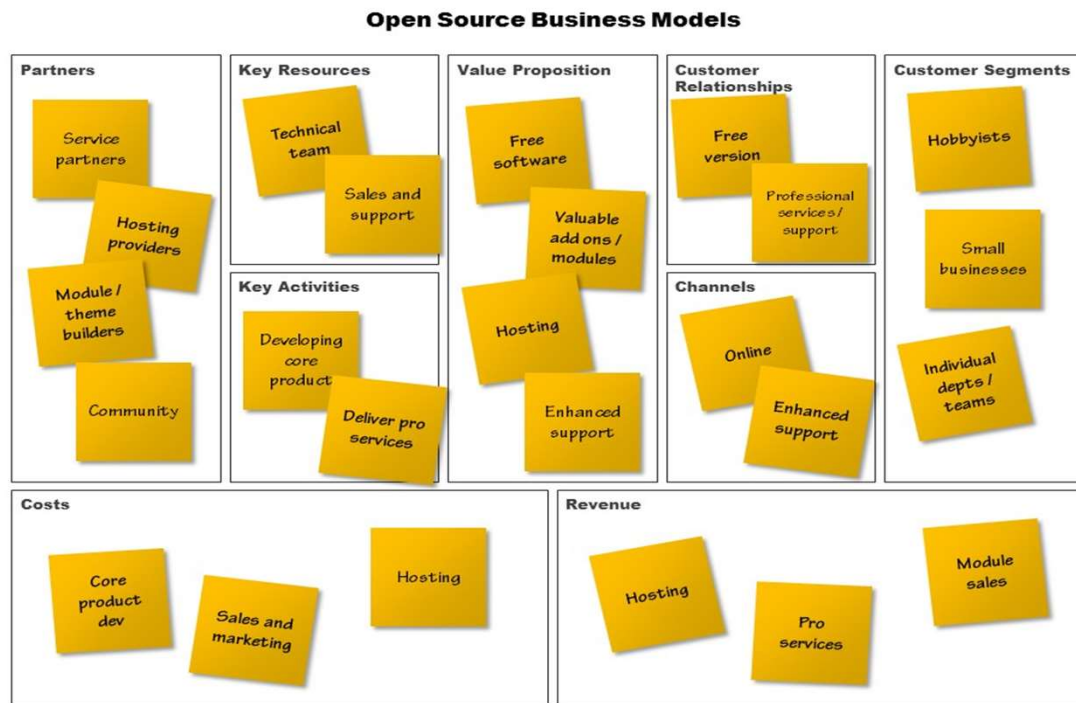
Free and Open Source Software

Law – Licences



Free and Open Source Software

- Management: New Business Models



Free and Open Source Software

- Software Engineering



Free and Open Source Software

- Informatics and End Using



Free and Open Source Software

- Economics and Social Approaches



Free and Open Source Software

- Motivations

Love



Money



Glory



Creative Commons

<https://creativecommons.org/licenses/>

The screenshot shows a web browser window with the URL <https://creativecommons.org/licenses/>. The page is titled "Características da Licença" (License Characteristics) and contains several sections for selecting license options:

- Características da Licença**
As suas escolhas neste painel irão atualizar os outros painéis nesta página.
Permitir que adaptações do seu trabalho sejam compartilhadas?
 Sim Não Sim, desde que os outros compartilhem igual
Permitir usos comerciais do seu trabalho?
 Sim Não
- Licença Seleccionada**
Atribuição-NãoComercial-Compartilhagual 4.0 Internacional

Esta não é uma Licença de Cultura Livre. *
- Ajude os outros a atribuírem-no!**
Esta parte é opcional, mas, ao preenchê-la, irá adicionar metadados legíveis por máquinas ao HTML sugerido!
- Tem uma página web?**

Open Access

Open
Access



Open Access

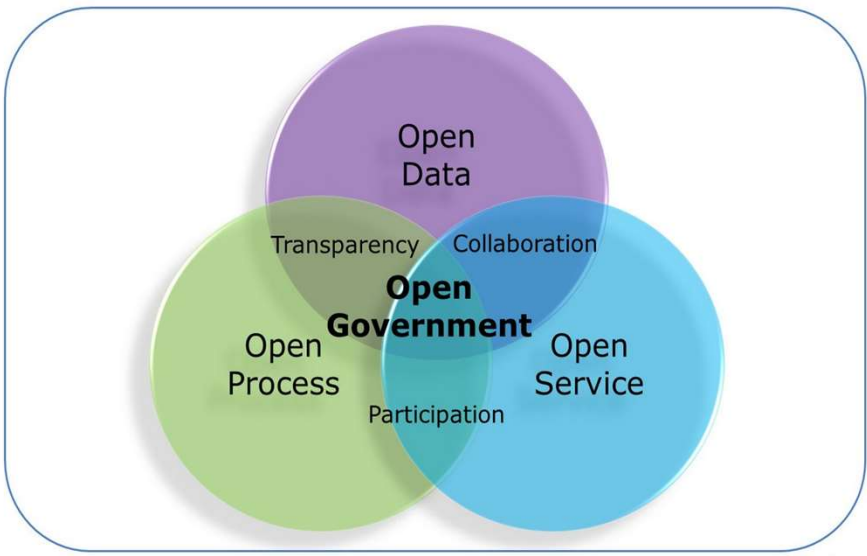


Open Data



- <https://www.pordata.pt/>
- <https://dados.gov.pt/pt/>
- <https://data.europa.eu/euodp/en/home>
- <https://data.europa.eu/euodp/en/data/group>
- <https://www.europeandataportal.eu/>
- <http://lisboaaberta.cm-lisboa.pt/index.php/pt/>

Open



Vision Paper: <http://ec.europa.eu/digital-agenda/en/news/vision-public-services>

Digital Transformation (DT)

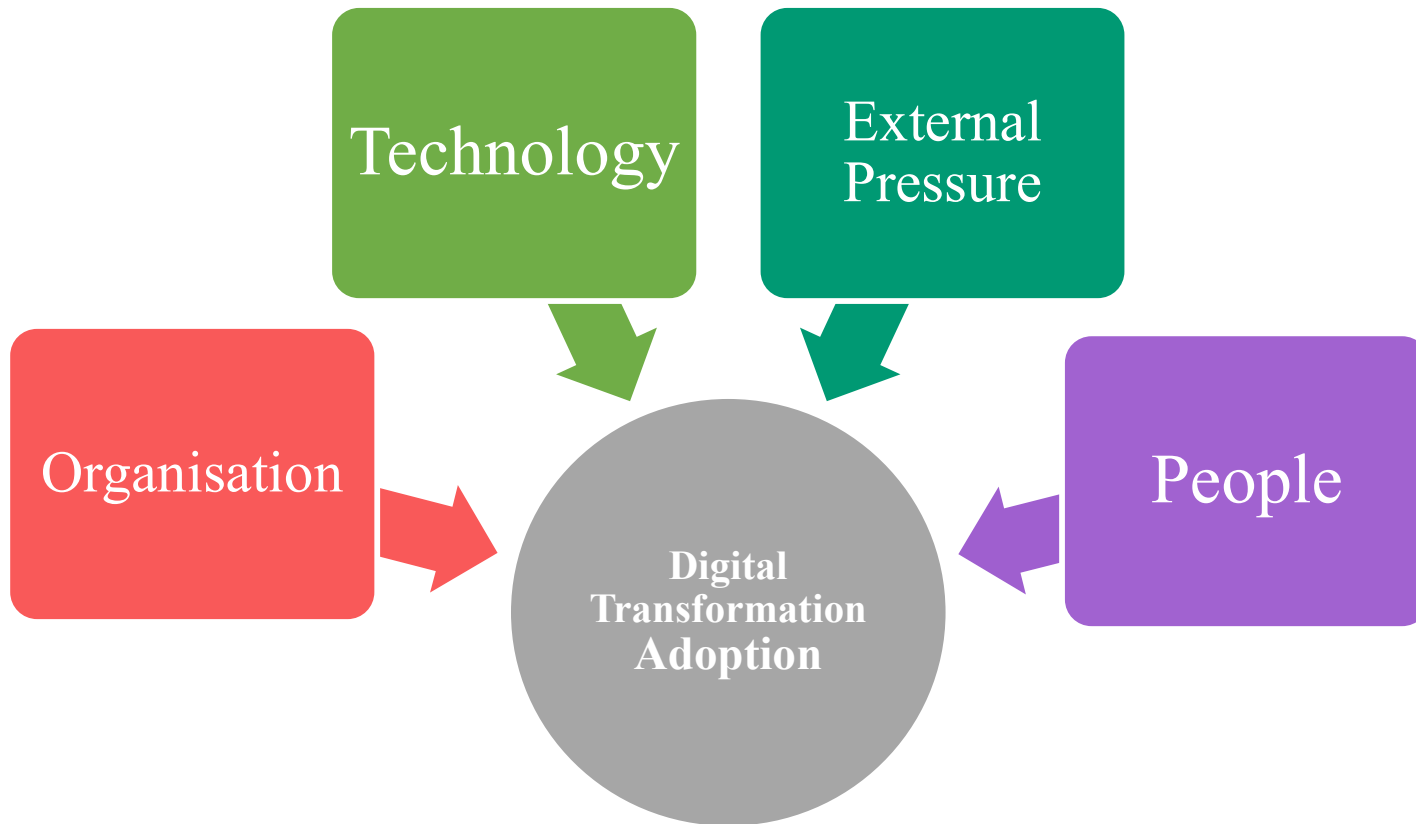
- Digital transformation applies digital technologies in every aspect of organizational processes to disrupt business models and propose new values to customers.
- Digital disruption happens when digital technologies cause fundamental changes in culture, markets, industries, and processes.
- The COVID-19 pandemic was a catalyst for transforming many business models.
- The process of DT brings substantial changes in the organization, and the c-suite leaders have an essential role. They should facilitate change management processes in companies and remove obstacles.

Digital Transformation Process

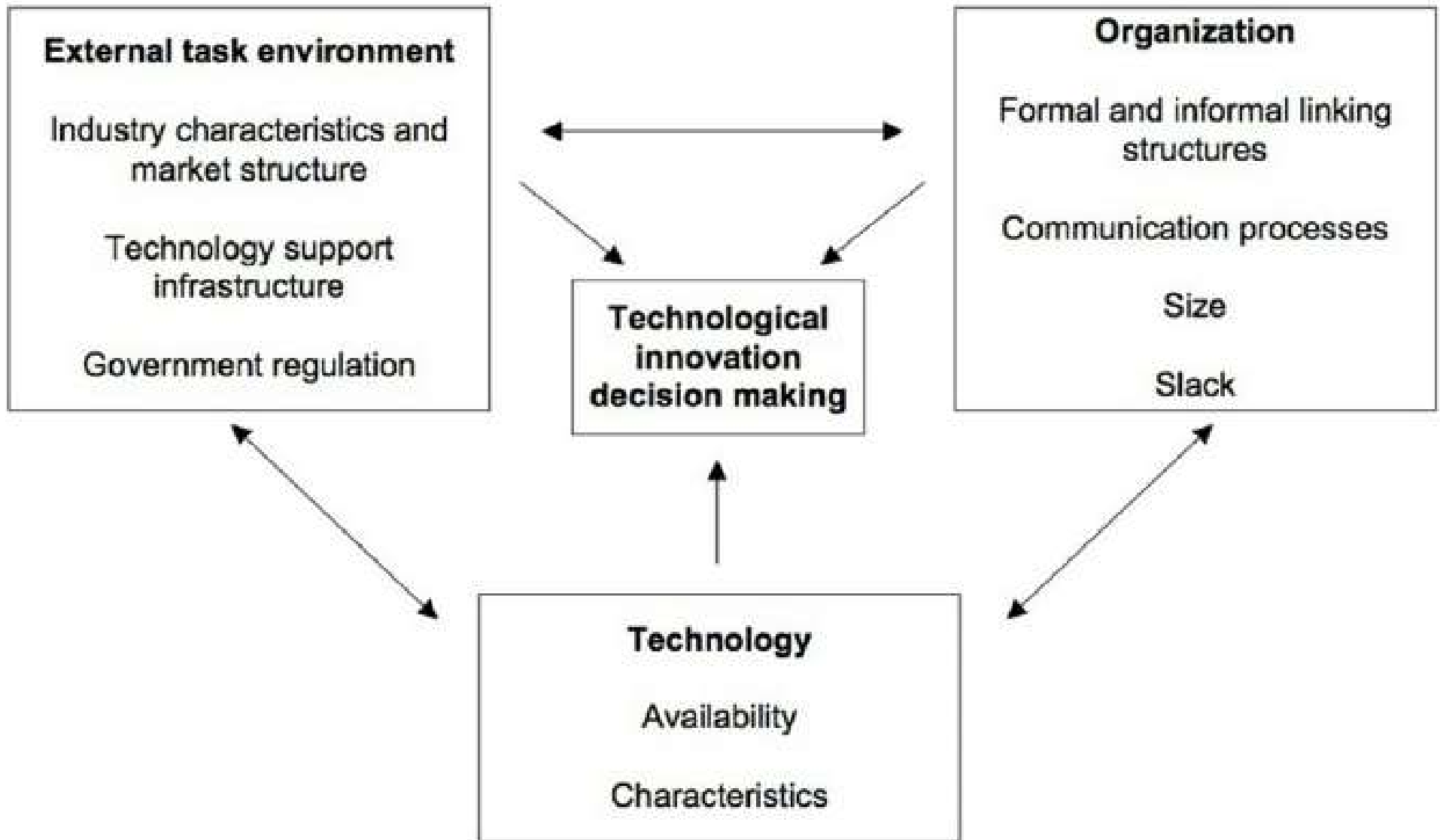
Source: Vial, 2019. Understanding digital transformation: A review and a research agenda

- digital technologies play a central role in the creation as well as the reinforcement of disruptions taking place at the society and industry levels. These disruptions trigger strategic responses from the part of organizations, which occupy a central place in DT literature. Organizations use digital technologies to alter the value creation paths they have previously relied upon to remain competitive. To that end, they must implement structural changes and overcome barriers that hinder their transformation effort. These changes lead to positive impacts for organizations as well as, in some instances, for individuals and society, although they can also be associated with undesirable outcomes.

Conceptual framework for the adoption of DT



TOE Framework (Source: Tornatzky and Fleischer, 1990)



Quiz 1

1. According to the framework of DT adoption, what are the sub-dimensions of Organization, Technology, External Pressure, and People?
2. What are the outputs of DT? (Advantages and Challenges)
3. How will DT contribute to economic, environmental and social performance?

Next Session

- IT in Business and Society
- **IT Infrastructure**
- Key Systems Applications
- Build and Manage Systems