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Operations

slides by João Claro and José Coelho Rodrigues

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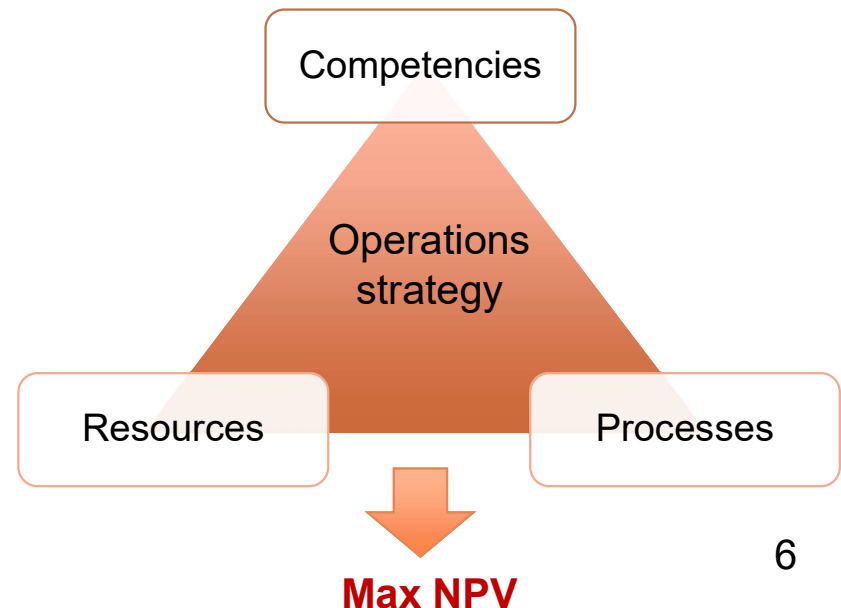# Operations

Operations and Strategy

Operations

- General definition
  - activites, tasks
  - usually implicit that tasks are planned and coordinated, and involve different people
- Academic perspective
  - study of work
- For managers
  - Planning and execution of work
  - in particular, products and services production and delivery

Complementary views

- ## The resource view
  - focused on assets (balance sheet)
- ## The process view
  - focused on tasks (using assets to generate results)
- ## The competencies view
  - focused on characterizing what the operation can and cannot do

Operations strategy

Plan for developing resources and configuring processes such that the resulting competencies maximize the NPV.

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Relation with competetive strategy

- Competitive strategy
    - select industry and choose product attributes on which to compete

- Operations strategy
    - focus on enabling the execution of the competitive strategy
        - how to best deliver the value proposition

Relation with competetive strategy

- Competitive strategy
    - select industry and choose product attributes on which to compete
    - example: in 2007, Toyota decided to enter the full size pick-up truck market by launching the upgraded Tundra model.

Relation with competetive strategy

- **Operations strategy**
  - focus on enabling the execution of the competitive strategy
    - how to best deliver the value proposition
  - example: Toyota chose assets and processes to best design, source, make, and distribute this new vehicle while developing competencies for new products.

Mercedes-Benz AG

- In 1993, built the first passenger car factory outsider Germany, in Tuscaloosa, Alabama, USA
  - to produce the M-class, in response to the runaway success of the Sport Utility Vehicles (SUVs)
  - US locations was chosen to circumvent the 25% import tariff

- The supply of parts was managing relations with 65 suppliers
- Distribution network transported the vehicles to 135 countries

Mercedes-Benz AG

Mercedes-Benz AG

- The first vehicle was sold in 1997 and actual demand quickly surpassed all forecasts and the anual production capacity of about 65K vehicles.
    - The initial plant ($300M) was expanded in 1998 and 1999 to about 80K vehicles ($80M), but even that was insufficient
    - From 1999 to 2002, the M-Class was also produced by contract developed and manufacturer Magna Steyr in Graz, Austria.
- In 2004, to prepare for the production of the new R-Class
    - doubled its production volume to 160K vehicles per year with new expansion ($600M)
    - doubled the factory size and doubled the workforce to approximately 4000 people
- In 2007, production record of 174K vehicles, overcome by a new record of 182K vehicles in 2012, and in the meanwhile…
    - new expansion, $70M and +500 people
    - new C-Class model (2014), +1000 people
    - new M-Class (2015), $350M and +400 people

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Operations

Operations strategy and
Operations management

Relation with operations management

- Different focus, scope and time scale

- Operations management
  - focus on appropriately utilizing given assets and processes
    - about immediate, specific issues

- Operations strategy
  - focus on developing assets and configuring processes
    - about future, general issues

Relation with operations management

- Operations management
  - focus on appropriately utilizing given assets and processes
    - about immediate, specific issues
  - example: in a retail bank, includes:
    - scheduling employees at each local branch (over the day/week/month) to assist customers in their savings and checking accounts, mortgages, personal loans, debit cards, credit cards…
    - managing check clearing and the daily flow of information and cash in the bank
    - …

Relation with operations management

- Operations strategy
  - focus on developing assets and configuring processes
    - about future, general issue
  - example: in a retail bank, includes:
    - decide on the division and coordination of labor and processing between the many branch offices and few bank offices
    - choose locations and capacities
    - decide which activities to outsource or when to form aliances at the retail level
   - build internal capabilities for information technology

Different views of operations

The Resource view

The Resource view

- Organization is considered as a set of real assets: tangible, intangible and human
  - Tangible and human "do" the work
  - Intangible embody the "know-how" to do the work
  - Resource are needed to coordinate and execute tasks
- Usefulness of this perspective
  - Deciding on the amounts and types of resources the operation needs
- Mercedes-Benz AG resources
  - Tangible: real estate, plant, production and support equipment
  - Human resources: 2000, and then 4000 people
  - Intangible: relationships with suppliers, process and product technologies, knowledge of the economic, legal and social environment, connections with logistics and transportation providers,…

The Resource view

Resources
- Sizing
- Timing
- Type
- Location
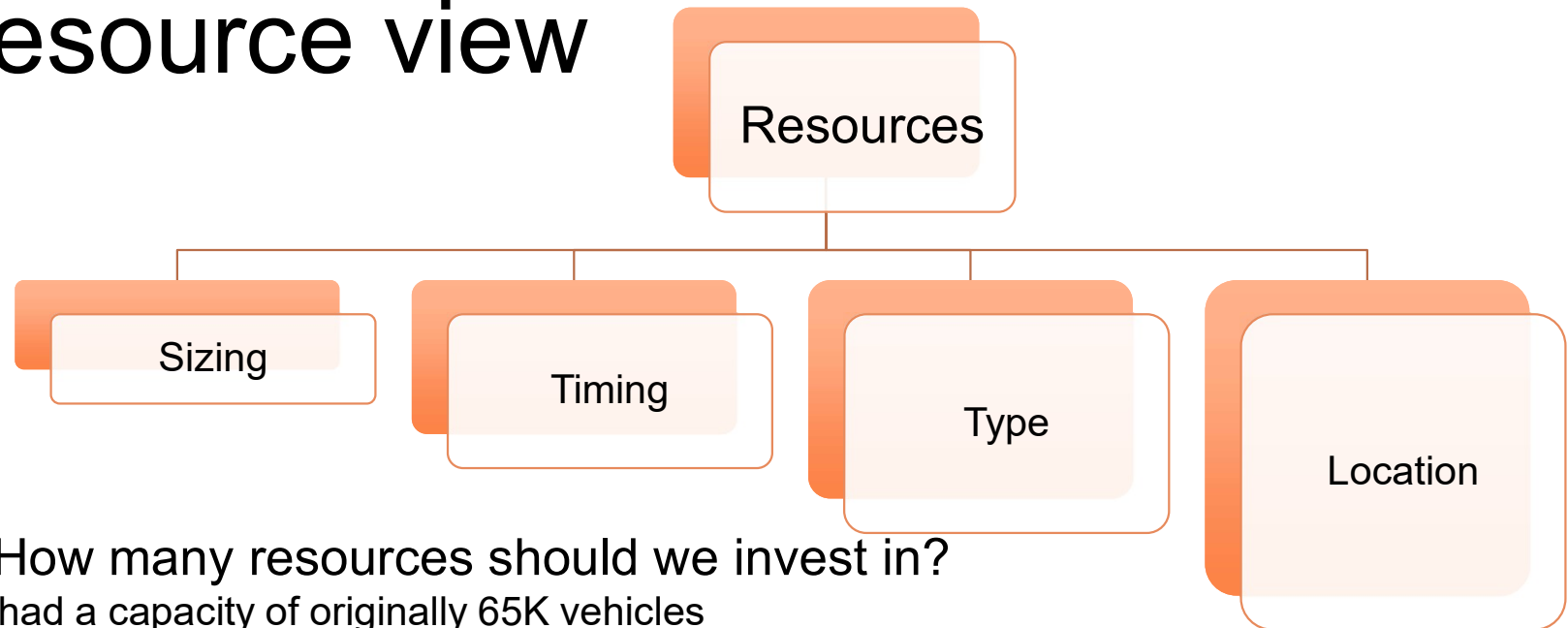
1. **Sizing**: How many resources should we invest in?
   Mercedes had a capacity of originally 65K vehicles

2. **Timing**: When should we increase or decrease resources?
   Mercedes capacity expanded to 80K in 1999 and 160K in 2004

3. **Type**: What kinds of resources are best?
   How is Mercedes capacity split into capacity for the M-class and the R-class?
   Are the assts specialized or flexible?

4. **Location**: Where should resources be located?
   Mercedes plant is located in Alabama. In the car industry, connections with suppliers are organized in a tree format.

«You need three things for a successful business – locations, location, location.»
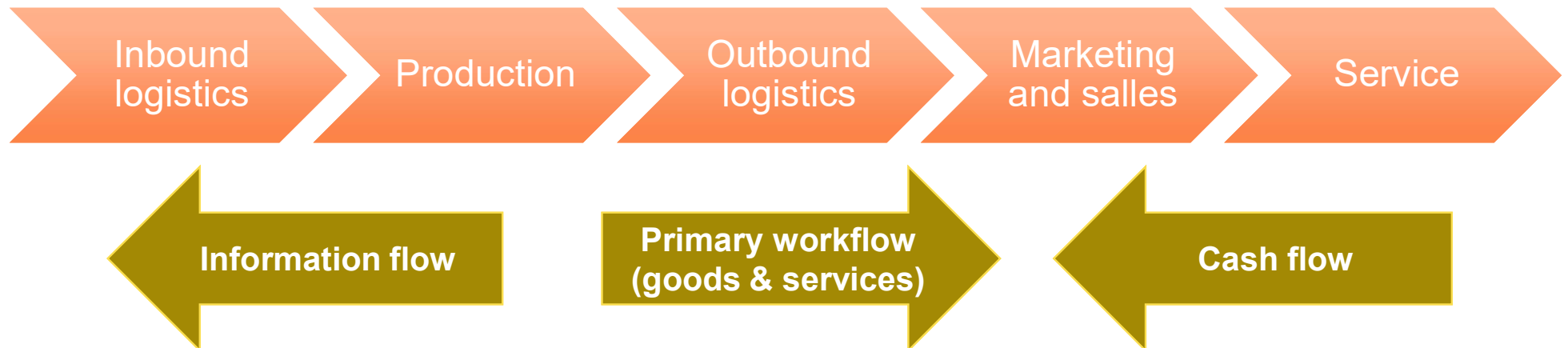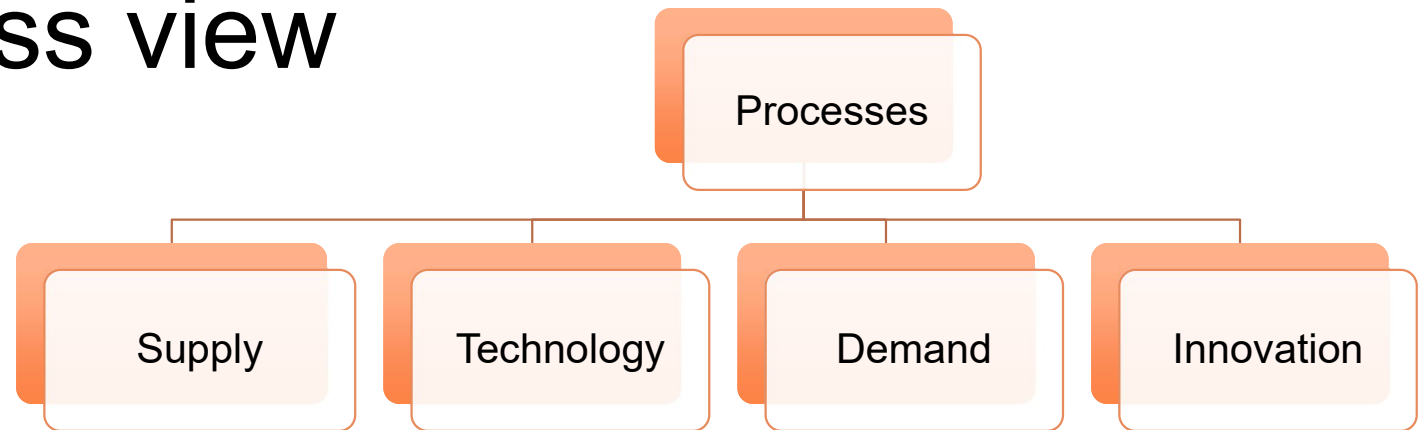Conrad Hilton

Different views of operations

The Process view

The Process view

- Purpose of resources is to work and generate value

  The process view highlights how resources perform activities and add value

- Processes
  - structured, recurrent activities that transform inputs into outputs; network of activities with specific precedence relationships among the activities
  - Detailed tasks: billing a customer, implementing and engineering change order
  - Aggregate tasks: new product development, customer service

| Inbound logistics | Production | Outbound logistics | Marketing and salles | Service |

| Information flow | Primary workflow (goods & services) | Cash flow |

The Process view

Processes

- Supply
- Technology
- Demand
- Innovation

1. **Supply**: When to outsource and how to manage suppliers?
   Mercedes owns engine plants, but outsources seat manufacturing

2. **Technology**: Which technologies do our processes need?

   - **Coordination and information**: Mercedes has centralized coordination for componentes/parts

   - **Product**: Is M-class designed in modules or as a single integral system?

   - **Process**: Processes organized by activity or by product-line?

   - **Transportation**: Which componentes are transported by truck, train, ship, airplane?

3. **Demand**: How do we match demand to available supply?
   Mercedes systematically undesrestimated demand of M-class.

4. **Innovation**: How and when do we improve and innovate?
   7 years after introducing M-class, Mercedes introduced R-class, and, in 2014, C-class.

Different views of operations

The Competencies view

The Competencies view

- A third factor: values
  - Standards by which employees set priorities
  - Examples: judging whether na order or customer is attractive or not, whether a suggestion to improve a product or process is attractive or marginal, and whether na investment is worth making or not
  - As organizations become more complex, consistente values are powerful mechanisms for employees to make independente but consistent decisions about priorities.

- Competencies
  - What the organization's resources, processes and values allow to do (its abilities)
  - Determine the set of outputs, products, and services that the operation will be particularly good at providing
  - Where competencies reside changes over time: they start in resources, gradually migrate to processes, and eventually reside in values.

The Competencies view
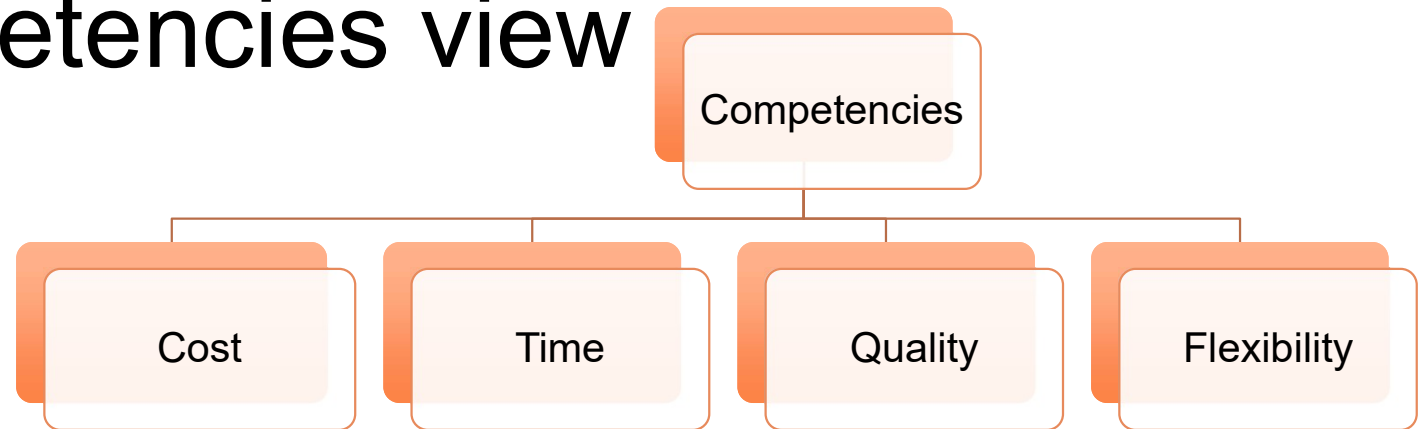
1. **Cost**: What is the total cost of operating?
   For Mercedes, the cost is not particularly important, since it does not operate in commodities markets or as a low margin business.

2. **Time**: What is the total time needed to transform inputs into outputs (lead time)?
   For Mercedes, time is moderately important

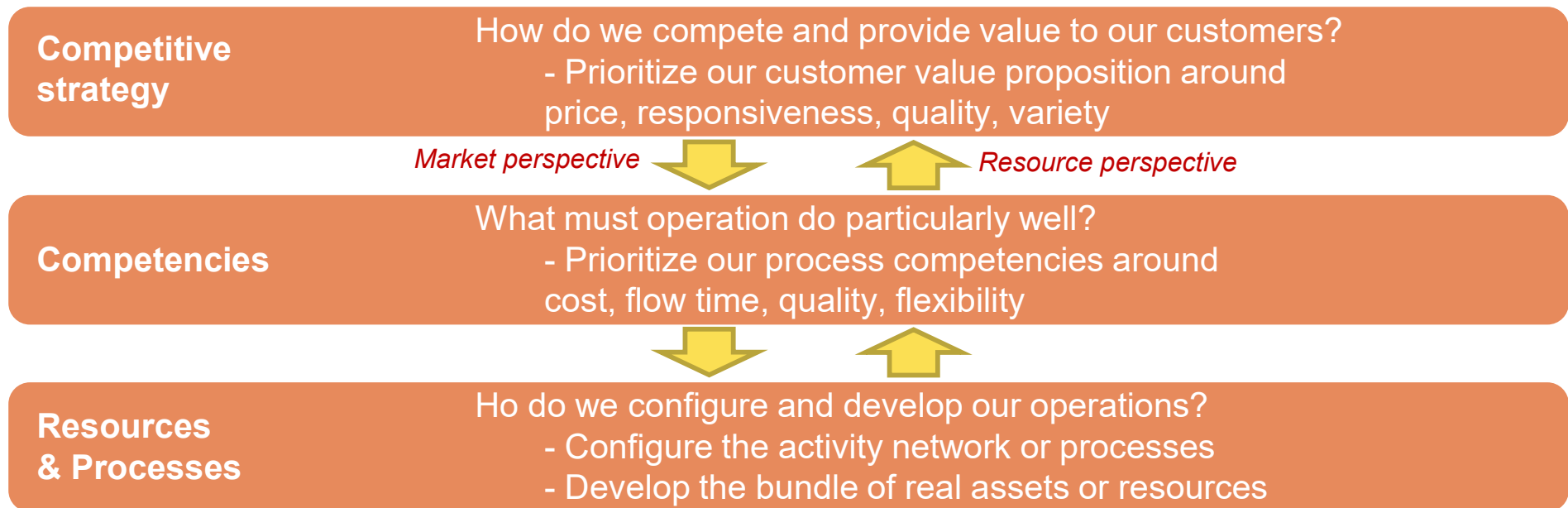3. **Quality**: What is the ability to deliver quality products?
   For Mercedes, quality is essential – and it is a key differentiator in luxury and high precision businesses.

4. **Flexibility**: What is the operation' flexibility to change inputs, activities, volumes, or outputs?
   Concerning M-class, Mercedes would benefits from volumes flexibility (at a capacity expansion level), once demand is not easily estimated
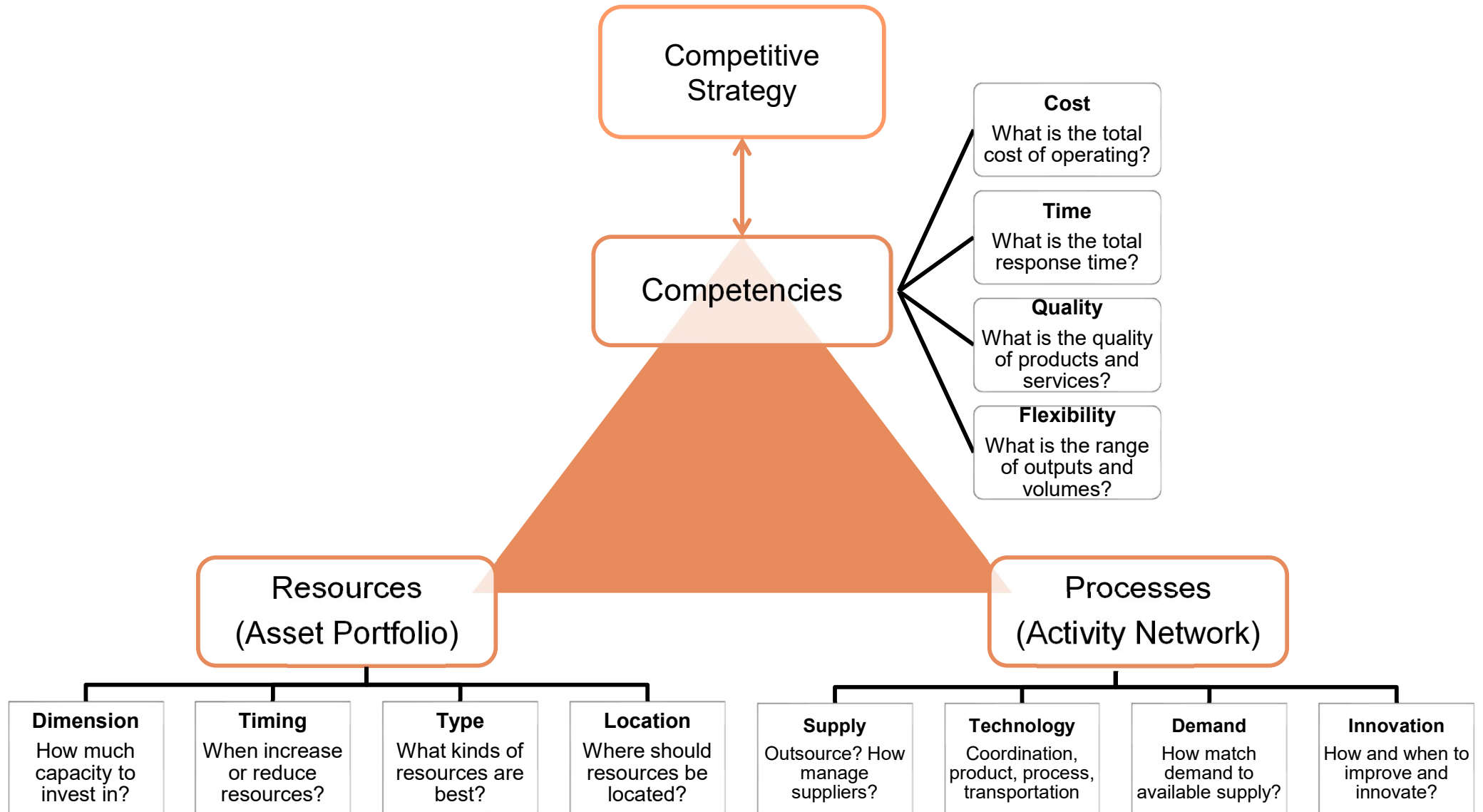
Principle of alignment

- Operations strategy should develop resources and configure processes such that the resulting competencies are aligned with (adap adapt to) the competitive position that the firm seeks over time

Competitive strategy	How do we compete and provide value to our customers? - Prioritize our customer value proposition around price, responsiveness, quality, variety

Market perspective ⬇ ⬆ *Resource perspective*

Competencies	What must operation do particularly well? - Prioritize our process competencies around cost, flow time, quality, flexibility

⬇ ⬆

Resources & Processes	Ho do we configure and develop our operations? - Configure the activity network or processes - Develop the bundle of real assets or resources

- It may be relevant to answer these questions in diferente orders…
  - In order to satisfy a new customer need, the firm may need to build new competencies, processes, and resources.
  - Those processes and resources may later be used to invent new products and services that may drive, if not create, new markets.

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Framework for operations strategy

Competitive Strategy

Competencies

Cost
What is the total cost of operating?

Time
What is the total response time?

Quality
What is the quality of products and services?

Flexibility
What is the range of outputs and volumes?

Resources (Asset Portfolio)

Processes (Activity Network)

Dimension
How much capacity to invest in?

Timing
When increase or reduce resources?

Type
What kinds of resources are best?

Location
Where should resources be located?

Supply
Outsource? How manage suppliers?

Technology
Coordination, product, process, transportation

Demand
How match demand to available supply?

Innovation
How and when to improve and innovate?

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The case of Zara

and Inditex Group

Zara and Inditex Group

Designer, manufacturer, distributor and retailer of fashion clothing.

- The first Zara shop opened its doors in 1975 in La Coruña

- In 2001, Inditex's IPO (Initial Public Offering) revealed its impressive financial performance: 16% earnings before interests and taxes, 39% return on capital employed, 24% revenue growth

- In 2003 had net sales of 3320 million Euros

- In 2005 had 724 stores, in more than 400 cities in 54 countries throughout Europe, the Americas, Asia, and Africa.

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- And today…
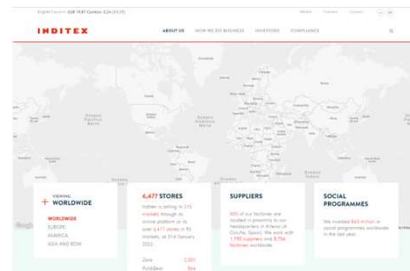
INDITEX

ABOUT US   HOW WE DO BUSINESS   INVESTORS   COMPLIANCE

Media   Careers   Contact

VIEWING

+ WORLDWIDE

WORLDWIDE
EUROPE
AMERICA
ASIA AND ROW

6,477 STORES

Inditex is selling in 215 markets through its online platform or its over 6,477 stores in 95 markets, at 31st January 2022.

Zara	2,007
Pull&Bear	864
Massimo Dutti	642
Bershka	971
Stradivarius	915
Oysho	556
Zara Home	482
Uterqüe	40

SUPPLIERS

50% of our factories are located in proximity to our headquarters in Arteixo (A Coruña, Spain). We work with 1,790 suppliers and 8,756 factories worldwide.

SOCIAL PROGRAMMES

We invested €63 million in social programmes worldwide in the last year.

Retrieved on May 2, 2022

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Zara and Inditex Group

- Differentiation: fast fashion – provide timely fashion to the masses – offers the lattest trends in international fashion, with a design closely related to the concerns and demands of the public

- Has the capability of designing more than 11000 new Styles per year with a design-to-rack time that can be as short as three weeks.

Competitive Strategy

- Differentiation in the eyes of the consumer
  - "fast fashion"
  - "cheap chic"

- Competencies prioritized
  - Speed and selection are *order winners*
  - Cost and quality are necessary qualifiers to be in the game

- Operations must be specially good at
  - Bring many new styles quickly from design to retail shelves
  - 11000 new styles per year
  - Three week design-to-rack time

Resource view

- Short design-to-rack times require short conversion time and immense coordination among major activities

- Tight coordination requires high vertical integration

- Capacity Portfolio
    - Design center with over 200 professionals (creative teams), with a design capacity of 11000 new Styles per year
    - Some manufacturing facilities (together with some local outsourcing of manufacturing)
    - Two central and big warehouses, both in Spain. The more recente, distribution center in Zaragoza, with 123000 m^2 has a distribution capacity of 80000 garments per hour, has direct access to the highway and railroad network, and is close to Zaragoza's airport, which favors fast handling of international deliveries
    - Controls 90% of the retail network (only 10% of stores are franchised)

Process view

- Supply
  - Supply network concentrated in Spain – physical proximity ensures receiving inputs quickly
  - Local facilities produce the trendy products with most demand uncertainty, while basic products with more predictable demand are manufactured offshore – local capacity is focused on the most time-sensitive production.

- Technology
  - Process technology can postpone the deying of fabric
  - Local manufacturing processes have short setup times and run in small batches, while offshore manufacturing has longer lead times
  - Distribution is highly centralized to reduce the number of stocking points and the associated handling time and so that one store's upide demand fluctuations can offset another's downside
  - Delivery system uses the most appropriate transportation mode, according to the time-sensitivity of the product
  - Frequent deliveries and short lead times
  - Information technology enables the daily information flow between store managers, requesting products and providing customer preference feedback, and design and production sharing information on upcoming products.

Process view

- Demand
  - Intentionally short cycle campaigns that are likely to run out of stock create a scarcity image
  - Customers visit stores frequently and are likely to buy what is available at that moment because that particular product may no longer be available next time
  - The combination of short campaigns and limited inventory reduces markdowns and leftovers

- Innovation
  - Fast new product design is a key enabler of Zara's strategy
  - Ideas inspired by urban hot spots, fashion shows, and store customer are trasmitted to the creative teams
  - Design style platforms are created ahead of the season and are modified just before production based on feedback from retailers to incorporate the "concerns and demands of the public"

Applicability of the model

- Should Zara's model be replicated by other industries? Should toy, cell phone, or car manufacturers copy this model?

- Main message: Great operations strategies are tailored to each company's competitive strategy

- A profitable application of the Zara model requires, at a minimum:
  - High customer willingness to pay for speed-to-market
  - Short product life cycles with high demand uncertainty
  - Low cost of excess capacity with low importance of scale economies
  - Low cost of stockouts and distribution relative to inventory holding

Exercise 1

Deciding to build or buy software
in a midsize company

Exercise 1 – Introduction

- Every company needs and uses software

  - For some, it is a significant driver of business success

- As small companies grow to midsize, software performance gaps emerge

  - New solutions can fix problems and inefficiencies or help develop innovative products or services

  - Midsize companies face a difficult choice: buy or build own software?

  - Sometimes buying software fails, and sometimes there is simply no software to address a business's unique problema

  - For small companies workarounds usually solve the problem, but midsize companies may lose a great deal of Money and stunt their growth due to inefficiencies of workarounds

  - For midsize companies workarounds may prevent them from seizing opportunities in a timely manner

  - Therefore, building own software may be an interesting option

Exercise 1 – Introduction

- Decision: Buy new software, or attempt to develop its own software?

- If the company can get what it needs from buying an existing solution, fantastic!

- Others try to outsource the problem to a software firm
  - Attention: Outsourcing successfully requires rigorous project management

- While deciding whether to buy, outsource or develop own software, opportunities might be lost…
  - Efficiencies that could be realized with software are not retrieved
  - Market opportunities are lost to competitors

- How can midsize business leaders determine when it makes sense to build their own software?

Exercise 1 – Introduction

- How can midsize business leaders determine when it makes sense to build their own software?

- It is inefficient to develop custom programs for core business functions where many options are already available:
    - Example: accounting, sales tax, inventory, customer relationship management (CRM), …

- But, if there is a high-value opportunity to seize or a significant efficiency to gain, and no software that does what is needed
    - There might be no choice but to develop…

- Example: BF&S Manufacturing
    - Contract manufacturer for complex, low-volume components for aerospace, military, medical and industrial verticals.

Exercise 1 – BF&S Manufacturing

- Read 1 page description of the case
- Characterize BF&S Manufacturing Operations Strategy according to our framework, focusing on the operations for software development
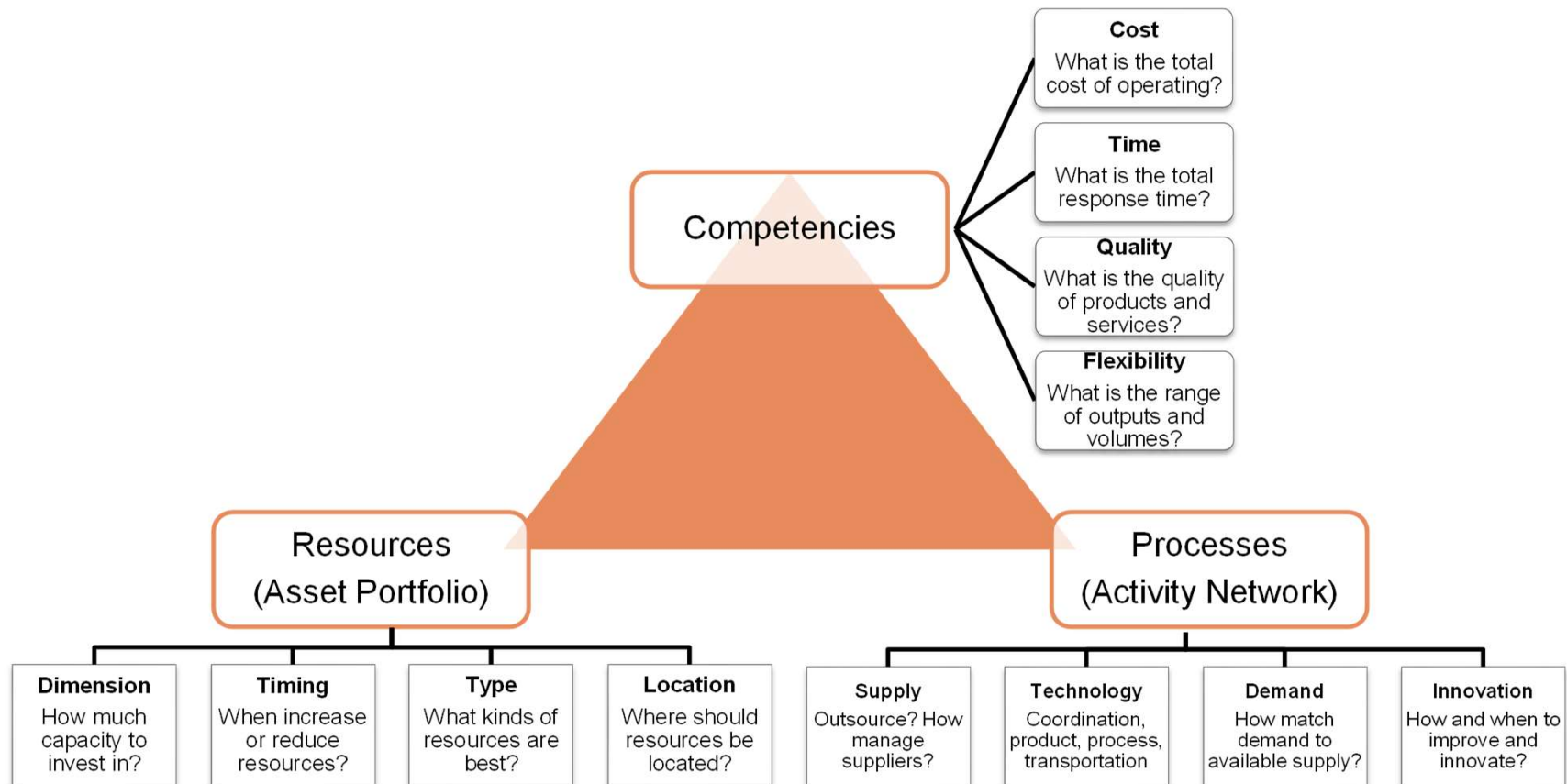
BF&S Manufacturing – Competencies view

- Overall competencies of BF&S Manufacturing
  - Flexibility and quality are winner competencies
  - Cost is qualifying competence (being cheaper than competitors)

- BF&S Manufacturing depends on close relationships with customers (must be good at this)

- Problems making relationships difficult: distance and boarder

- Solution: software to support relation based on data from core enterprise resource planning (ERP) system with a format that customers can use
  - 24/7 real-time data
  - Own development
  - Provide "transparency into and a measure of control over the production"

BF&S Manufacturing – Resource view

- Dimension
  - Started with the "computer guy"
  - Has grown to a software development team supporting 4 facilities (500 people)

- Timing
  - In 2007 (now!) – Fear of loosing customers to more closely based manufacturers, even if they charged more

- Type
  - Software developers
  - Engineers and operations leaders – They ensure understanding of company business and customers' needs

- Location
  - In company facilities

BF&S Manufacturing – Process view

- Supply
  - Information about company business and customers' needs provided by engineers and operations leaders

- Technology
  - Provide 24/7 real-time production data from ERP system in a format customers can use
  - Initially: Tool to track raw materials, work-in-progress, and finished goods inventories, providing visibility
  - Later extended to: video of the workstations, video of products' progress at each step, raw and finished good inventories, information about people working on the job, and data about all the product stories and specifications

- Demand
  - Customers wanted to oversee the work, software provides tools for that increasingly better

- Innovation
  - Develop own solution customized to specific problem
  - Keep improving the solution, with customizations based on feedback (internal and external)

Exercise 1 – Further interesting details

- Resources
  - Need to hire them (assess, interview…), train and on-board

  - Ensure digital environment for development and testing

  - May need Development Operations executive to supervise work if team surpasses 5 or 6 engineers

- Process
  - Manage the code development activities – Make sure they are productive

  - Organize processes for translating business opportunities and needs on features, functions and option wanted ahead
    (software roadmap to guide development work)

Exercise 1 – Concluding remarks

The three competencies needed to develop own software

Different cases require different amounts of these competencies, depending on how complex the custom code requirements are…

1. **Translate business needs into software products**

- A form of engineering where one leg stands in the business and the other in a thorough understanding of how current software systems work

- Can be held by one executive in a smaller midsize company, or by a team as organization grows

- Input: problem or opportunity
- Output: series of detailed steps to create and maintain solution
  – What data to be used
  – What logic or processes to produce solution

Exercise 1 – Concluding remarks

The three competencies needed to develop own software

2. **Code development**

- Depending on the circumstances (needs, opportunities…), a midsize company can have
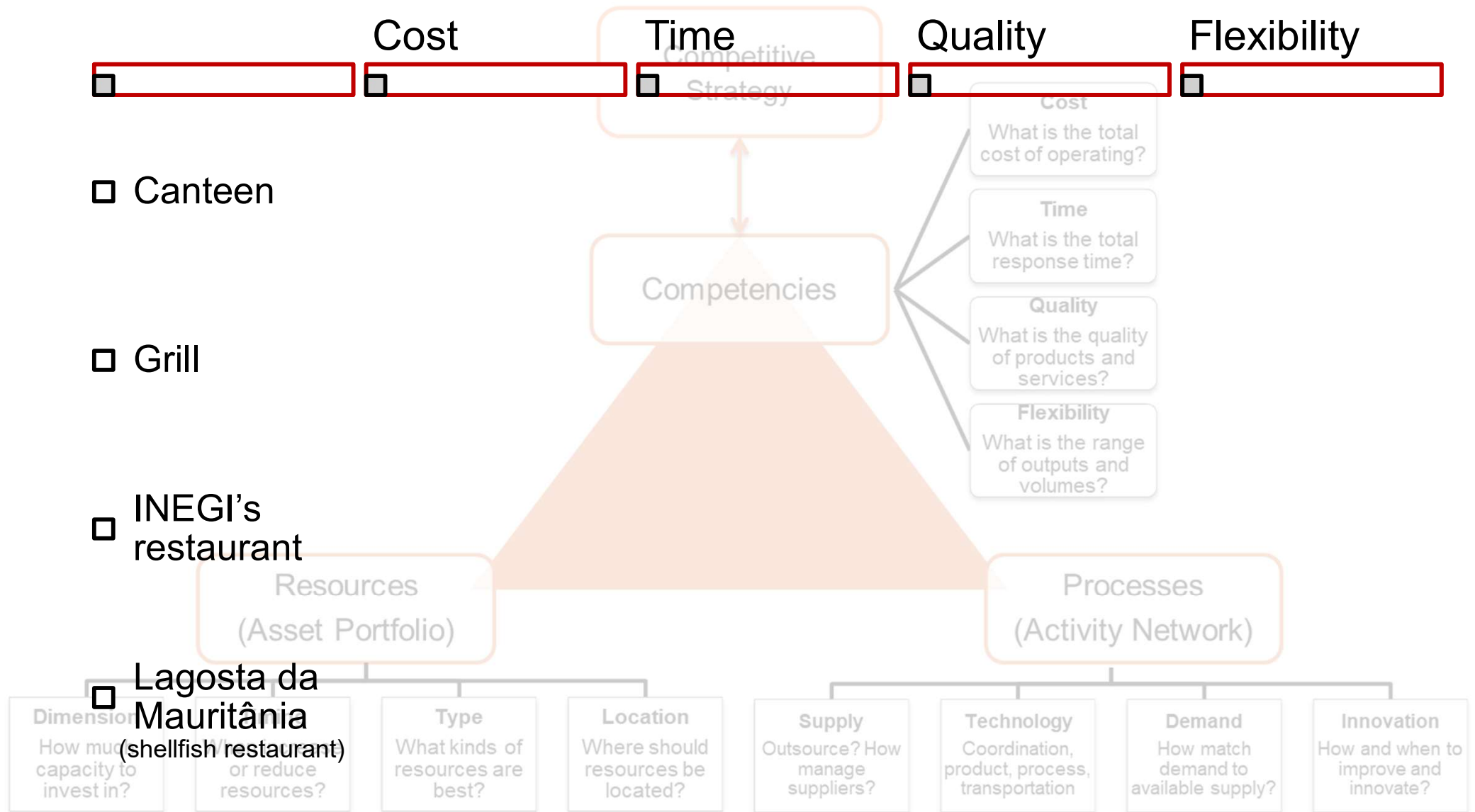 - 1 developer or
  - A full engineering department

3. **Software operations**

- Maintain the health of the custom software
- Make sure processes, people and tools are up-to-date
- May include:
  - User support / Help desks, Training, Security risk management, Bug fixing, Ongoing customization, …

Exercise 2

Canteen vs. Restaurant
operations

Framework for operations strategy

Cost **Time** **Quality** **Flexibility**

- Canteen

- Grill

- INEGI's restaurant

- Lagosta da Mauritânia (shellfish restaurant)

Competitive Strategy

Competencies

Cost
What is the total cost of operating?

Time
What is the total response time?

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What is the quality of products and services?

Flexibility
What is the range of outputs and volumes?

Resources
(Asset Portfolio)

Processes
(Activity Network)

Dimension
How much capacity to invest in?

Structure
What to acquire or reduce resources?

Type
What kinds of resources are best?

Location
Where should resources be located?

Supply
Outsource? How manage suppliers?

Technology
Coordination, product, process, transportation

Demand
How match demand to available supply?

Innovation
How and when to improve and innovate?

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