Setting Up Businesses

Topic 4. Technical viability

Ladislao Luna Sotorrío
Elisa Baraibar Diez
Ignacio Llorente García
María Dolores Odriozola Zamanillo

Organisation of Business and Work, Administration and Human Resource Management

4.1. Role of production in the creation of a company.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management.

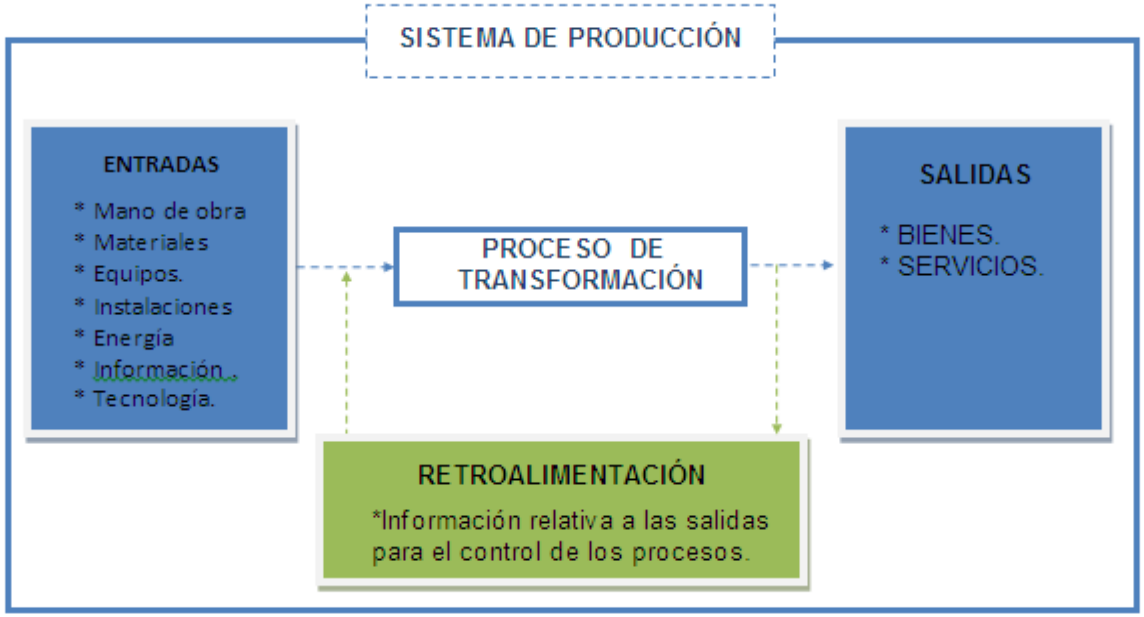
4.3. Capital budget.

4.4. Estimation of fixed and variable costs.

4.5. Quantification of the operating range (INTERVALO OPERATIVO).

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.1. Role of production in the creation of a company



- **Inputs (industrial companies):** diverse raw material, labor, energy, equipment, facilities, information and technology.

- **Inputs (service companies):** mainly labor.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

1. Location.
2. Investment in fixed assets.
3. Description of production process.
4. Plant layout.
5. Productivity.
6. Standardization.
7. Quality control.
8. Human resources.
9. Current assets management.
10. Cost of warranty.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

1. Location:

Decision based on:

- Capacity needs: size, building, etc.
- Manufacture or production strategy: plant layout.
- Future requirements of the manufacturing process.

You have to analyze different possibilities, bearing in mind that location is NOT flexible enough to proceed to correction without incurring serious consequences.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

1. Location:

- Closeness to marketplace.
- Easy availability of raw materials.
- Infrastructure and communications.
- Work restrictions.
- Industrial resources in the area.
- Planning legislation.
- Economic and fiscal grants.
- Price.
- Competitors.
- Other factors (weather, community attitudes, etc.).

Example. Location: which is the best location?

An entrepreneur has to decide between two alternative locations for the company. Three factors are considered:

Factor	Weighting
Infrastructure and communications in the area	10
Competition	6
Economic and fiscal grants	4

A value is assigned to each factor for each alternative (1 to 5):

Alternative 1: F1 = 5; F2 = 1; F3 = 2

Alternative 2: F1 = 3; F2 = 5; F3 = 1

Which alternative is selected

Example. Location: which is the best location?

$$I = \frac{\sum_{i=i}^{N} P_i \cdot F_i}{N} = \frac{(P_1 \cdot F_1) + (P_2 \cdot F_2) + \cdots + (P_N \cdot F_N)}{N}$$

Factor	P_i Weighting
Infrastructure and communications in the area	10
Competition	6
Economic and fiscal grants	4

A value is assigned to each factor for each alternative (1 to 5):

F_i

Alternative 1: F1 = 5; F2 = 1; F3 = 2 → $I_1 = \frac{(10 \cdot 5) + (6 \cdot 1) + (4 \cdot 2)}{3} = 21,33$

Alternative 2: F1 = 3; F2 = 5; F3 = 1 → $I_2 = \frac{(10 \cdot 3) + (6 \cdot 5) + (4 \cdot 1)}{3} = 18$

That's interesting… you should take a look!

Local bien ubicado, negocio asegurado

- Quién es tu cliente y dónde esta. Cuáles son sus hábitos de compra.
- Isocronas.

Las claves para elegir un local comercial

- ¿Junto a los competidores?
- Accesibilidad (planes urbanísticos).
- Sentido de la marcha del tráfico.

Cómo seleccionar la calle y el local perfecto

- Movimiento comercial.
- Zona soleada (depende del producto).
- Locales en esquina.
- Mobiliario urbano.
- Amplitud.

Emprendedores.es

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

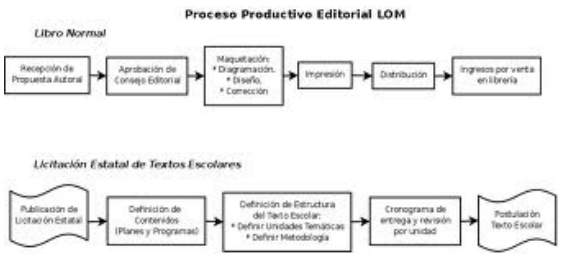
2. Investment in fixed assets:

- Great importance in industrial companies.
- In other companies it will also be necessary to establish needs as regards establishments, furniture and facilities.
- Define the industrial process in detail.
- The acquisition value represents the cost of the equipment once installed and ready to run, including the cost of transportation and installation, as well as expenses concerning project definition (study, training, etc.).
- The acquisition of fixed assets generates a cost to the company (depreciation).
- An alternative to the acquisition of fixed assets is leasing or renting.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

3. Description of production process:

- Set of activities that constitute the process of transformation taking place within the company.
- It is the creation of products (good and/or services) from productive factors (raw materials, capital, labor, energy, information…).
- It is a technical matter, that requires the collaboration of experts.
- The entrepreneur has to know how technological processes are carried out to offer products or services.



4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

4. Plant layout:

- **Definition:** arrangement of the spaces and facilities of a factory, in order to achieve the best possible coordination between the basic production activities, so that processes are conducted in the most rational and economical way.

- **Benefits of a good plant layout:**
  - Movement of materials is reduced.
  - Manufacturing process is facilitated.
  - Capacity of production is increased.
  - Saving space.
  - Utilization of materials is improved.
  - Provides comfort and security to staff.

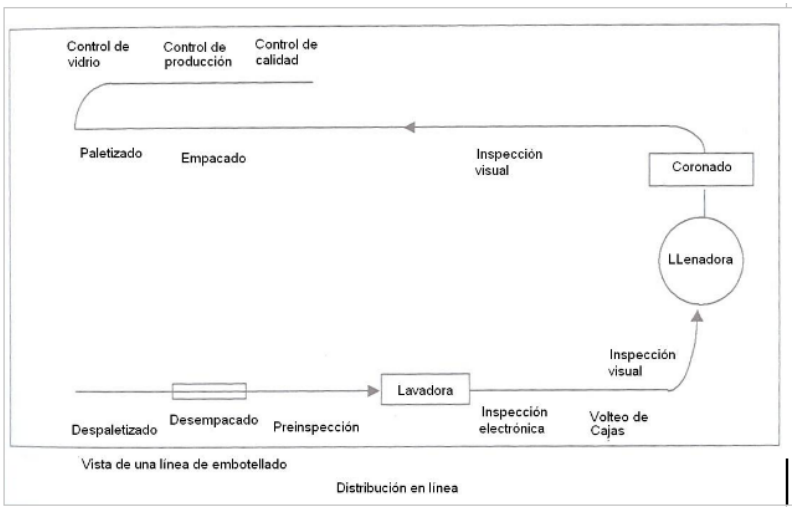
Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

4. Plant layout:

- **Principles:** full integration of the basic elements of production (human resources, equipment, materials), minimum and continuous movement of materials and in-process materials, use of space in three dimensions, safety and satisfaction in every position, flexibility.

- **Types:**
  - Product or line layout.

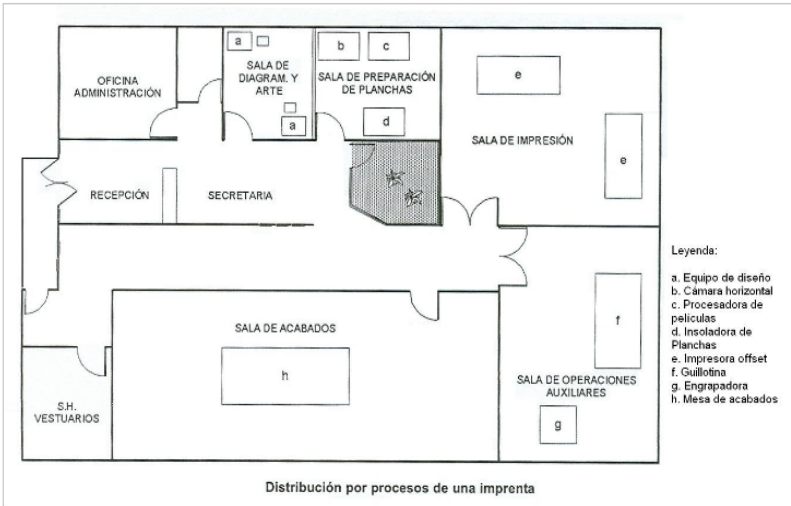


4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

4. Plant layout:

- **Principles:** full integration of the basic elements of production (human resources, equipment, materials), minimum and continuous movement of materials and in-process materials, use of space in three dimensions, safety and satisfaction in every position, flexibility.

- **Types:**
  - Product or line layout.
  - Process or functional layout.



Distribución por procesos de una imprenta

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

4. Plant layout:

- **Principles:** full integration of the basic elements of production (human resources, equipment, materials), minimum and continuous movement of materials and in-process materials, use of space in three dimensions, safety and satisfaction in every position, flexibility.

- **Types:**
  - Product or line layout.
  - Process or functional layout.
  - Fixed position or location layout.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

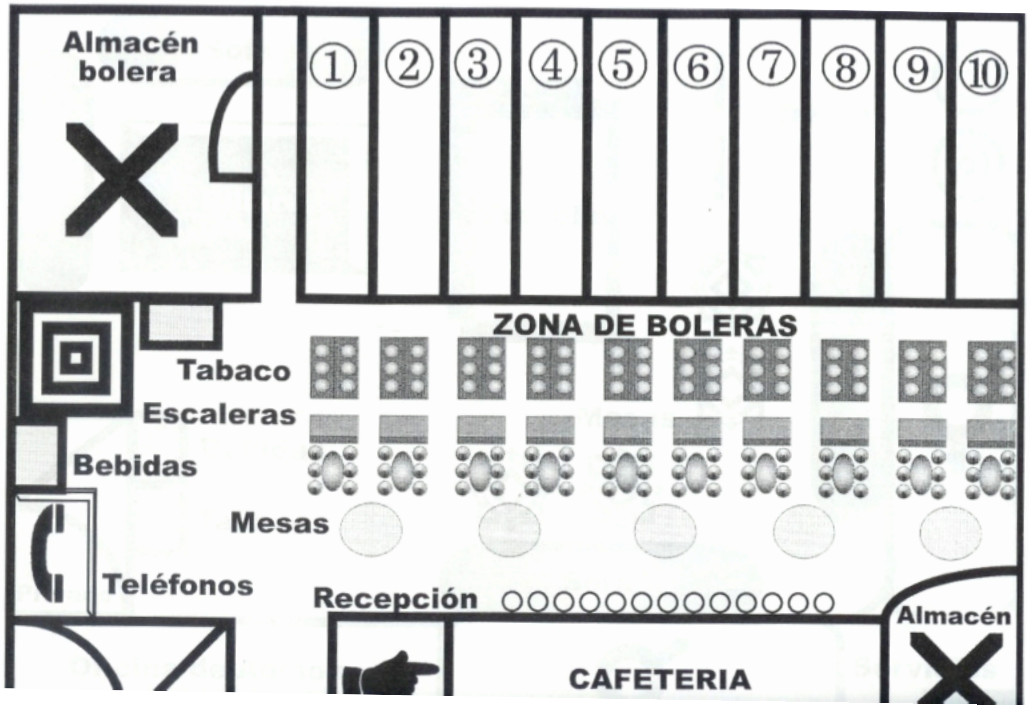
4. Plant layout:

- **Principles:** full integration of the basic elements of production (human resources, equipment, materials), minimum and continuous movement of materials and in-process materials, use of space in three dimensions, safety and satisfaction in every position, flexibility.

- **Types:**
  - Product or line layout.
  - Process or functional layout.
  - Fixed position or location layout.
  - Combined or group layout.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

4. Plant layout → Shop plan or floor plan

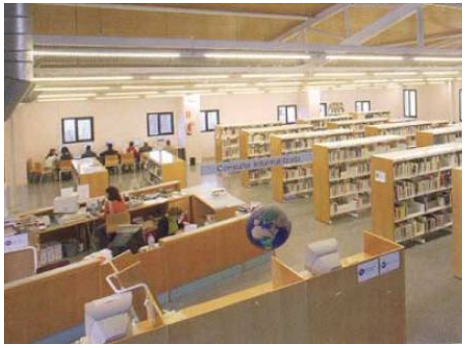


4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

4. Plant layout → Shop plan or floor plan

http://www.mas.es/noticia/hosteleria-interiorismo.aspx

Nuevo Café Vecchio (A Coruña). *«La distribución en planta ha sido estudiada escrupulosamente para dotar al local de la máxima funcionalidad. Así, hemos optado por una distribución equilibrada que configura un local llamativamente versátil, con espacios adaptados a cada tipo de público. El nuevo Vecchio se articula entorno a cuatro zonas claramente diferenciadas por la iluminación y el mobiliario con el objetivo de atender a los diferentes tipos de público».*



4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

5. Productivity:

- **Definition:** a measure that allows us to assess the efficiency of the processes and factors that influence production.

- **Ratio:**

$$\text{Productivity} = \frac{\text{Output}}{\text{What is required to produce output (input)}}$$

- **Factors most often considered:**
  - Capital or machines involved in the production process.
  - Raw materials used.
  - Human resources directly involved.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

Example. Productivity

A company with a capital of 500 million euros uses two furnaces to produce 1,000 tons/day of steel, melting 80 tons/day of scrap with a staff of 50 workers. Calculate the productivity of the company.

Capital productivity 

Machine productivity 

Labor productivity 

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

Example. Productivity

A company with a capital of 500 million euros uses two furnaces to produce 1,000 tons/day of steel, melting 80 tons/day of scrap with a staff of 50 workers. Calculate the productivity of the company.

Capital productivity $= \dfrac{1.000 \text{ tons/day}}{500 \text{ million euros}} = 2 \text{ tons/day per million euros.}$

Machine productivity $= \dfrac{1.000 \text{ tons/day}}{2 \text{ furnaces}} = 500 \text{ tons/day per furnace.}$

Labor productivity $= \dfrac{1.000 \text{ tons/day}}{50 \text{ workers}} = 20 \text{ tons/day per worker.}$

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

5. Productivity:

- In order to achieve an increase in productivity, several improvements can be made:

  - Improvements in products:
    · Quality control.

  - Improvements in aspects of production:
    · Machinery layout and operators.
    · Health and safety at work.
    · Staff training.
    · Incentives.
    · Communication.

  - Improvements in production:
    · Production planning and control.
    · Cost control.
    · Production control.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

6. Standardization:

- **Definition:** process that regulates the way in which a task is performed.

- **Advantages:**

  - For the manufacturer:
    - Simplification → Reduced costs of the production process.
    - Marketing benefits both in domestic and international markets.
    - Possible to compare.

  - For the consumer:
    - Guaranteed quality, regularity, safety and interchangeability.
    - Quick replacement of damaged, broken or defective pieces.
    - Reduced lead time.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

6. Standardization:

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

6. Standardization:

- **Industry standards:**

  - Mandatory:
    - Basic building regulations.
    - Technical regulations.
    - Ordenanza General de Seguridad e Higiene en el Trabajo.
    - Collective agreements.
    - Ordenanzas municipales.

  - Non-mandatory:
    - UNE-CEN (AENOR) standards.
    - Sectoral technology standards.
    - ISO standards.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

7. Quality control:

- Quality control prevents failures or malfunctions which may occur in a product, process or service when quality requirements are not applied.
- Do the right thing but also constantly improve.
- Steps to be followed:
  - Obtain feedback from customers to find out if the product meets their needs.
  - Technical engineering transforms the client's wishes into drawings.
  - Various production processes and business services are carried out to obtain the desired products.
  - Delivery under the most ideal conditions.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

7. Quality control:

- Implementation throughout the entire production process is required: balance between three qualities: default (technical), manufacturing (obtained) and required (customer).

- Compare the value of quality to the cost of quality. There is no sense making products with a higher quality than expected in the market because improving quality is very expensive.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

8. Human resources:

- Having defined the activity, the facilities and the technical means, promoters should consider:
  - How many people will be needed
  - How they are going to be hired
  - What qualifications they should have
  - Salary
  - How to make the selection
  - Category
  - What responsibilities they will have
  - Training
  - Etc.

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

9. Current assets management:

- An initial amount of cash is proposed around 20% of current liabilities.
- Regarding inventories…
- Cost to the company to maintain a level of stocks in relation to its value.

$$Ia = \frac{\text{Total storage costs for a year}}{\text{Value of programmed stock}} \cdot 100$$

Total cost of inventories

$$C_T = D_T \cdot p + \frac{D_T}{Q} \cdot C_{lp} + \frac{Q}{2} \cdot \left(p + \frac{C_{lp}}{Q}\right) \cdot I_a$$

- $D_T \cdot p$: Value of annually consumed parts (Number · Price)
- $\frac{D_T}{Q} \cdot C_{lp}$: Number of orders · Cost of each order
- $\frac{Q}{2} \cdot \left(p + \frac{C_{lp}}{Q}\right) \cdot I_a$: Stock average · Value of every piece in stock · Storage costs

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

9. Current assets management:

- An initial amount of cash is proposed around 20% of current liabilities.
- Regarding inventories…

$$\frac{\partial C_T}{\partial Q} = 0 = \frac{-D_T \cdot C_{lp}}{Q^2} + \frac{p \cdot I_a}{2} = 0$$

Economic order quantity

$$Q_e = \sqrt{\frac{2 \cdot D_T \cdot C_{lp}}{I_a \cdot p}}$$

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

Example. Current assets management

A commercial company estimates that the annual demand for the “Popi Puppet” toy will be 20,000 units. The company buys the product from the supplier at a price of 100 €/unit. The carrier has given a quote for freight costs of 1,000 €/order. Storage costs (renting, theft insurance, employee costs, storage losses and financing costs) per year are 50 €/unit. Give the:

1. Purchase amount for each order.

2. Frequency of orders.

3. Total cost of storage.

Example. Current assets management

A commercial company estimates that the annual demand for the “Popi Puppet” toy will be 20,000 units. The company buys the product from the supplier at a price of 100 €/unit. The carrier has given a quote for freight costs of 1,000 €/order. Storage costs (renting, theft insurance, employee costs, storage losses and financing costs) per year are 50 €/unit.

Storage costs per year		50 €/ud
Value of pieces in storage		100 €/ud
Ia		
Number of pieces	DT	20,000.00
Price	p	100.00
Freight cost	Cp	1,000.00

Example. Current assets management

A commercial company estimates that the annual demand for the “Popi Puppet” toy will be 20,000 units. The company buys the product from the supplier at a price of 100 €/unit. The carrier has given a quote for freight costs of 1,000 €/order. Storage costs (renting, theft insurance, employee costs, storage losses and financing costs) per year are 50 €/unit.

Storage costs per year		50 €/ud
Value of pieces in storage		100 €/ud
Ia		**50%**
Number of pieces	DT	20,000.00
Price	p	100.00
Freight cost	Cp	1,000.00

Example. Current assets management

A commercial company estimates that the annual demand for the "Popi Puppet" toy will be 20,000 units. The company buys the product from the supplier at a price of 100 €/unit. The carrier has given a quote for freight costs of 1,000 €/order. Storage costs (renting, theft insurance, employee costs, storage losses and financing costs) per year are 50 €/unit. Give the:

Purchase amount for each order

$$Q_e = \sqrt{\frac{2 \cdot D_T \cdot C_{lp}}{I_a \cdot p}} = \sqrt{\frac{2 \cdot 20000 \cdot 1000}{50\% \cdot 100}} = 894$$

Number of orders = DT / Qe = 20.000 / 894 = 22,36 orders.

Frequency of orders = 365 / Number of orders = 365 / 22,36 = 16,32 days.

Total cost of storage

$$C_T = 20.000 \cdot 100 + \frac{20.000}{894} \cdot 1.000 + \frac{894}{2} \cdot \left(100 + \frac{1.000}{894}\right) \cdot 50\% = 2.044.971{,}36\ €$$

Example. Liquid assets budget

After studying existing terms, customers in your market pay in thirty, sixty and ninety days. That is, for every 1,000 euros of sales you are going to collect 333 euros the first month, 333 the second month and 333 the third month.

As for your suppliers, you are required to pay half at the time of purchase and half 30 days later.

The liquid assets budget (no other charges applied), considering that the activity began in September, could be calculated with a template like this.

Example. Liquid assets budget

	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
1.- OPENING BALANCE					
Sales	15,000	18,000	20,000	24,000	77,000
Sales already paid					
Other income					
2.- TOTAL REVENUE	**0**	**5,000**	**11,000**	**17,667**	**30,667**
Purchases	5,000	6,000	6,666	8,000	25,666
Paid purchases					
Staff					
Overheads					
Marketing					
Management					
Taxes					
Other expenses					
3.- TOTAL EXPENDITURE					
4.- NET BALANCE(2-3)					
CLOSING BALANCE (1-4)					

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

Example. Liquid assets budget

	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
1.- OPENING BALANCE	**0**	**-2,500**	**-3,000**	**1,667**	
Sales	15,000	18,000	20,000	24,000	77,000
Sales already paid		5,000	5,000 + 6,000	5,000 + 6,000 + 6,666	33,667
Other income					
2,- TOTAL REVENUE	**0**	**5,000**	**11,000**	**17,666**	**30,667**
Purchases	5,000	6,000	6,666	8,000	25,666
Paid purchases	2,500	2,500 + 3,000	3,000 + 3,333	3,333 + 4,000	21,666
Staff					
Overheads					
Marketing					
Management					
Taxes					
Other expenses					
3,- TOTAL EXPENDITURE	**2,500**	**5,500**	**6,333**	**7,333**	**2,1666**
4,- NET BALANCE(2-3)	**-2,500**	**-500**	**4,667**	**10,334**	**12,001**
CLOSING BALANCE (1-4)	**-2,500**	**-3,000**	**1,667**	**12,001**	

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.2. Key technical aspects in the creation of a company: location, production process, human resources and current assets management

10. Human resources:

- When a company starts, it may encounter problems when selling its products because it lacks a reputation that guarantees the quality and reliability of supply.
- The cost of warranty depends on the reliability of the product: the probability that a given product will satisfactorily perform the specific mission for which it was designed, **for a certain period** and under a given set of conditions.

Catastrophic failures

Degradation failures

$$\textbf{Reliability} = \frac{\text{Number of units without failures in a period of time}}{\text{Total number of units}}$$

$$\text{Cost of warranty} = (1 - \text{Reliability}) \cdot \text{Cost of product} \cdot \text{Number of units.}$$

- With this cost of warranty, a strategy for post-sale service can be defined.

4.3. The capital budget

- Once the entrepreneur has examined…
  - Location.
  - Infrastructure and equipment.
  - The way production is organized.
  - Staffing.
  - Inventory needs.

- Capital budget must be **QUANTIFIED**.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.3. The capital budget

Quantify technical aspects to search for sources of funding

CONCEPT	AMOUNT
Tangible assets	
Intangible assets	
Financial assets	
Capital assets	
Stocks	
Realizable assets	
Available / cash	
Current assets / Liquid assets	
TOTAL CAPITAL BUDGET	

Be realistic, rigorous and objective.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

CONCEPT	AMOUNT
Tangible assets	
Land Buildings Machinery / Transport Facilities Furniture	
Intangible assets	
Patents, logos, trademarks Goodwill	
Financial assets	
Capital assets	
Stocks	
Goods Finished products Products in process Waste / Ancillary products Raw material Packaging	
Realizable assets	
Customers / Debtors / Bills receivable Advances to staff / Advances to suppliers Speculative financial investment	
Available / cash	
Cash / Banks	
Current assents / Liquid assets	
TOTAL CAPITAL BUDGET	

4.3. The capital budget

- Capital budget depends on the dimension that we decided to give the new company, which in turn is limited by the expected demand and technological and financial constraints.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

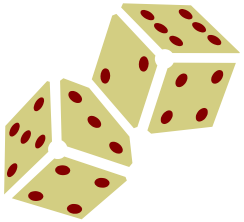
4.3. The capital budget

- Total costs and unit costs of the company.
- Forecasting the benefits (along with the revenue estimate).
- Enables quantifying its gross margin.
- Enables identifying break-even point (punto muerto).

$$\text{Beneficio} = P_V \cdot N_V - (C_F + C_V \cdot N_V) \qquad P_M = \frac{C_F}{P_V - C_V}$$

- Enables finding out the operating range of production.

Let's solve a quiz!



Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

FIXED COSTS	AMOUNT
DEPRECIATION OF INFRASTRUCTURE	
Start-up expenses Computer software and computers Buildings Technical facilities Machinery Tools Transport elements	
FIXED PART OF REMUNERATION	
FIXED PART OF CONTRACTS	
Leasing Services received Other contractual obligations	
FIXED FINANCIAL BURDEN	
FIXED PART OF OVERHEADS	
Advertising Cleaning Provisions Cost of storage Maintenance Average cost of financing current assets (stocks, customers) Others	
FIXED PART OF TAXES	
INSURANCE	
TOTAL	

VARIABLE COSTS	AMOUNT
CONSUMPTION OF PACKAGING	
CONSUMPTION OF RAW MATERIAL	
CONSUMPTION OF SEMI-FINISHED PRODUCTS	
CONSUMPTION OF OTHER SUPPLIES	
VARIABLE PART OF THE REMUNERATION	
VARIABLE PART OF CONTRACTS	
Leasing Services received Other contractual obligations	
VARIABLE PART OF FINANCIAL BURDEN	
VARIABLE PART OF TAXES	
VARIABLE PART OF OVERHEADS	
Advertising Cost of storage Maintenance Average cost of financing current assets (stocks, customers) Others	
TOTAL	

4.5. Quantification of the operating range

- **OPERATING RANGE (INTERVALO OPERATIVO):** graphical and quantified representation of the range of sales for which the company makes profits. This range starts at the break-even point and ends at the point of maximum production.

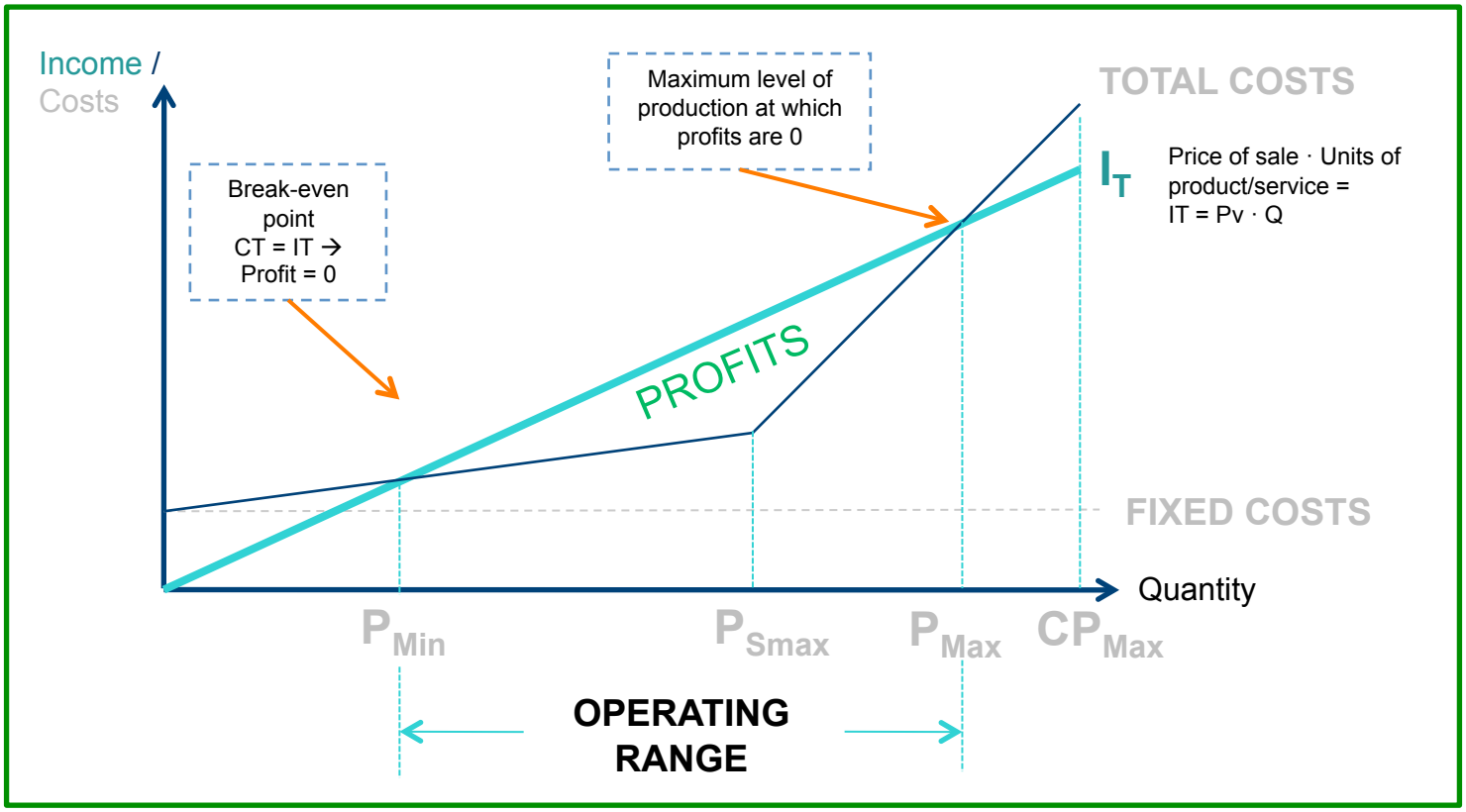
- **MINIMUM PRODUCTION (PRODUCCIÓN MÍNIMA):** break-even point. Below this level of sales, the company makes losses.

- **STANDARD MAXIMUM PRODUCTION (PRODUCCIÓN ESTÁNDAR MÁXIMA):** this is that level of production that the company can reach at a normal pace of work, that is, without forcing production through overtime, extra shifts, etc.

- **MAXIMUM PROFITABLE PRODUCTION (PRODUCCIÓN MÁXIMA RENTABLE):** this is where the total cost curve, forcing production, cuts the total revenue curve again.

- **MAXIMUM PRODUCTION CAPACITY (CAPACIDAD DE PRODUCCIÓN MÁXIMA):** maximum capacity of production in the company.

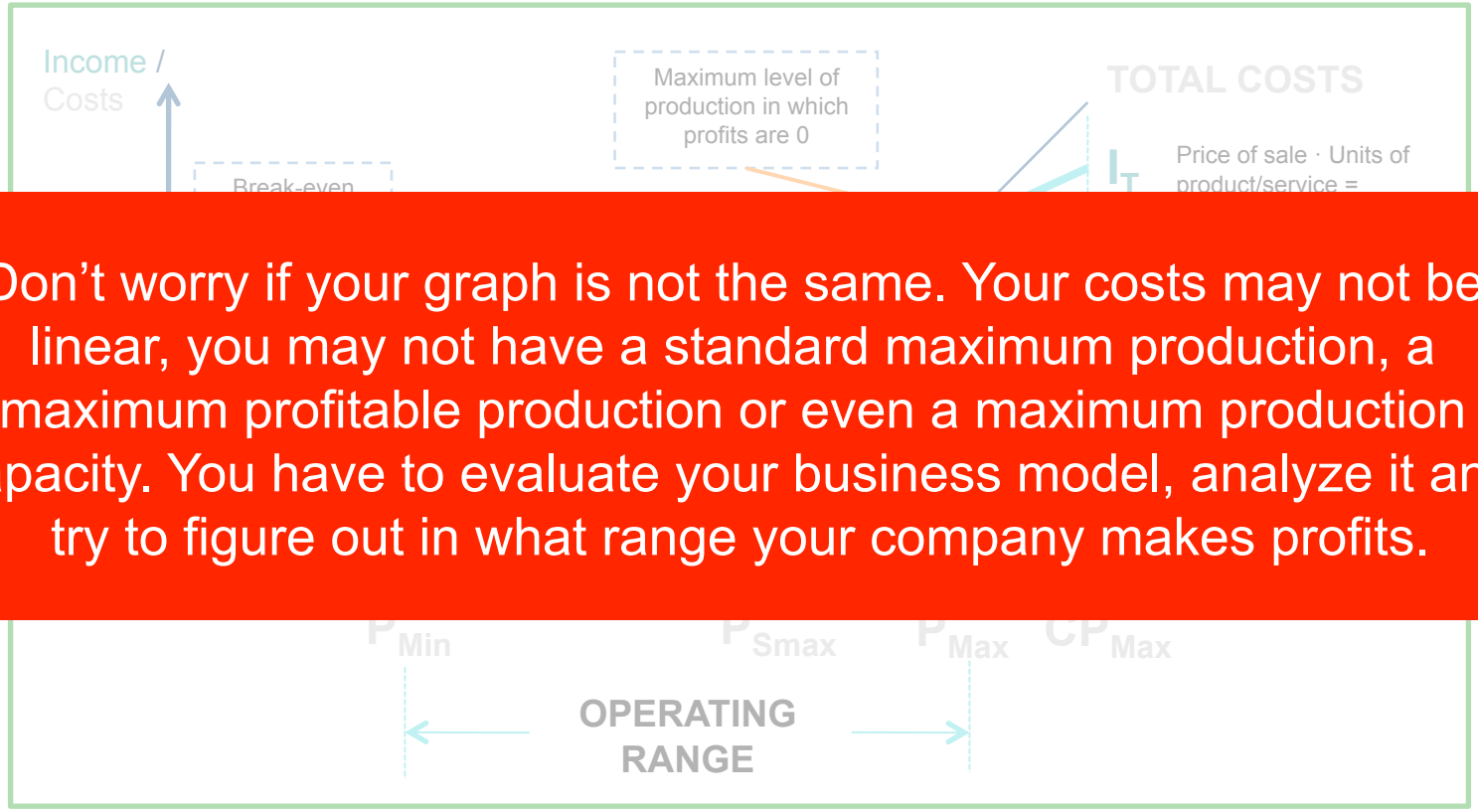
4.5. Quantification of the operating range



P_{Min} = Minimum amount sold for profit (break-even point).
P_{Smax} = Standard maximum production. Production level that the company can reach at a normal pace of work.
P_{Max} = Maximum profitable production.
CP_{Max} = Maximum production capacity.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.5. Quantification of the operating range



Don’t worry if your graph is not the same. Your costs may not be linear, you may not have a standard maximum production, a maximum profitable production or even a maximum production capacity. You have to evaluate your business model, analyze it and try to figure out in what range your company makes profits.

P_{Min} = Minimum amount sold for profit (break-even point).
P_{Smax} = Standard maximum production. Production level that the company can reach at a normal pace of work.
P_{Max} = Maximum profitable production.
CP_{Max} = Maximum production capacity.

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

4.6. Commercial viability test

What to do:
- Answer the questions (Yes = 1 / No = 0).
- Calculate the equation.
- Understand the result (identify improvements).

ECONOMIC VIABILITY TEST	YES	NO
I know the technology to be used in the production process of the product or service (functions, organization, equipment, etc.) NECESSARILY AFFIRMATIVE.	YES	
C1: I have determined the location of the company	25	0
C2: I know the number of workers I need	25	0
C3: I know the investment required in infrastructure and equipment	25	0
C4: I know the cost of land, renting or building	4	0
C5: I know where and at what cost to purchase raw materials and key components	4	0
C6: I know most pre start-up costs (advertising, electricity, water, telephone)	4	0
C7: I know the minimum stock level and its cost	4	0
C8: I know cash requirements (cash or banks) to face early days when there are only expenses	4	0
C9: I know the cost of supplies	4	0
C10: I know the cost of financing	1	0
C11: I know the cost of warranty	1	0
C12: I know costs related to legal regulations (health and safety, social security, local...)	1	0
C13: The product or service meets quality standards	1	0
C14: The production process meets environmental regulations	1	0

$$TVT = \frac{\sum_1^3 C_i \cdot 25 + \sum_4^9 C_i \cdot 4 + \sum_{10}^{14} C_i}{104} = \frac{Sum}{104}$$

RESULT	IDEA	VIABILITY
0-50%	Undeveloped idea	More development
50-80%	Idea with prospects	Some aspects should be concretized
80-100%	Well-defined idea	It could be viable (economic viability)

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

Conclusion of technical viability

- Determining the size of the company.
- Calculation of the capital budget, where financial needs are quantified and the application of funds studied.
- Estimation of total costs, fixed and variable.
- Quantification of the operating range in which the company makes profits.

Keywords

Budget

Human resources

Location

Operating range

Plant layout

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

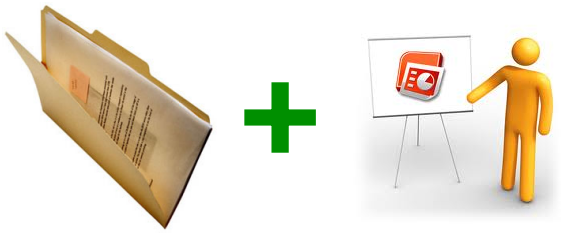
Tasks (Topic 4)

Find software packages that exist to help entrepreneurs draw up a business plan. Make a list of them. Which one do you think is the most usable? The easiest to understand? The best?

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

Project guiding notes – Basic outline

1. General description of the idea. *How did I come up with the idea (opportunity, failure, inefficiency).*
2. Economic viability.
3. Commercial viability.

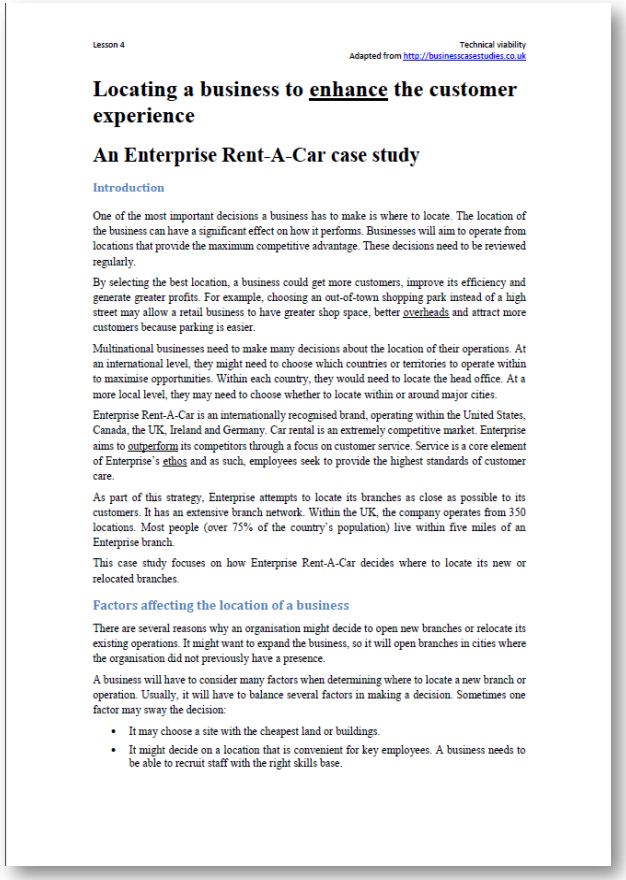


4. Technical viability.
   - **A.** Key technical elements.
   - **B.** Quantified capital budgeting and cost estimation. Operating range.
   - **C.** Is it technically viable? Identify potential improvements.

«I hear and I forget, I see and I remember, I do and I understand».
Confucius

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo

Case studies (Topic 4)



Lesson 4

Technical viability
Adapted from http://businesscasestudies.co.uk

Locating a business to enhance the customer experience

An Enterprise Rent-A-Car case study

Introduction

One of the most important decisions a business has to make is where to locate. The location of the business can have a significant effect on how it performs. Businesses will aim to operate from locations that provide the maximum competitive advantage. These decisions need to be reviewed regularly.

By selecting the best location, a business could get more customers, improve its efficiency and generate greater profits. For example, choosing an out-of-town shopping park instead of a high street may allow a retail business to have greater shop space, better overheads and attract more customers because parking is easier.

Multinational businesses need to make many decisions about the location of their operations. At an international level, they might need to choose which countries or territories to operate within to maximise opportunities. Within each country, they would need to locate the head office. At a more local level, they may need to choose whether to locate within or around major cities.

Enterprise Rent-A-Car is an internationally recognised brand, operating within the United States, Canada, the UK, Ireland and Germany. Car rental is an extremely competitive market. Enterprise aims to outperform its competitors through a focus on customer service. Service is a core element of Enterprise's ethos and as such, employees seek to provide the highest standards of customer care.

As part of this strategy, Enterprise attempts to locate its branches as close as possible to its customers. It has an extensive branch network. Within the UK, the company operates from 350 locations. Most people (over 75% of the country's population) live within five miles of an Enterprise branch.

This case study focuses on how Enterprise Rent-A-Car decides where to locate its new or relocated branches.

Factors affecting the location of a business

There are several reasons why an organisation might decide to open new branches or relocate its existing operations. It might want to expand the business, so it will open branches in cities where the organisation did not previously have a presence.

A business will have to consider many factors when determining where to locate a new branch or operation. Usually, it will have to balance several factors in making a decision. Sometimes one factor may sway the decision:

- It may choose a site with the cheapest land or buildings.
- It might decide on a location that is convenient for key employees. A business needs to be able to recruit staff with the right skills base.

Topic 4 – Technical viability.
Case Study 1 (PDF).

Ladislao Luna Sotorrío, Elisa Baraibar Diez, Ignacio Llorente García and María Dolores Odriozola Zamanillo