JACOBS UNIVERSITY

INDUSTRIAL ENGINEERING

Prof. Dr. Dr.-Ing. Yilmaz Uygun

Chapter 02

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Chapter 02

STRATEGIC PLANNING

OUTLINE

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1	General Production Types (w/ exercise)
2	Location Selection (w/ exercise)
3	Location Prioritization (w/ exercise)

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PRODUCTION TYPES

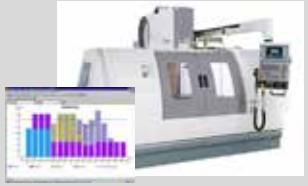
KEY METRICS OF PRODUCTION

Inventory

Lead time

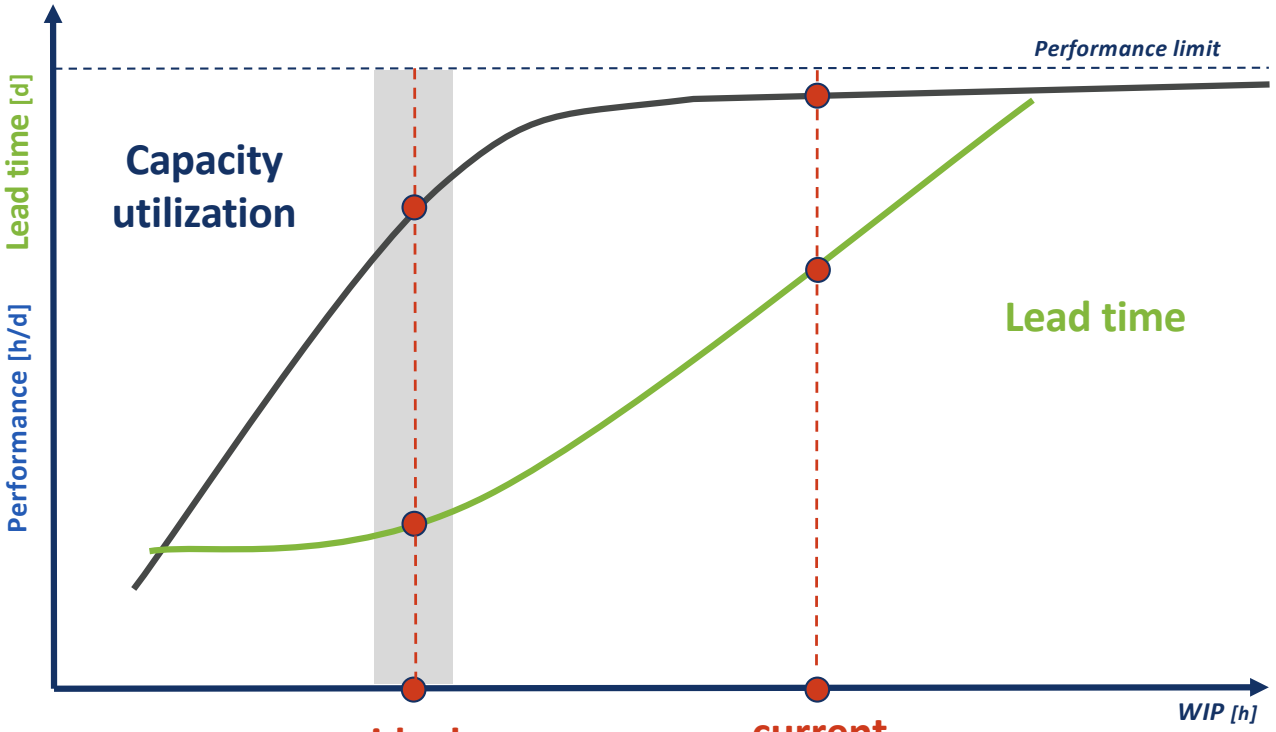
Due date reliability

Market-related



Capacity utilization

Company-related



MORPHOLOGY OF PRODUCTION TYPES

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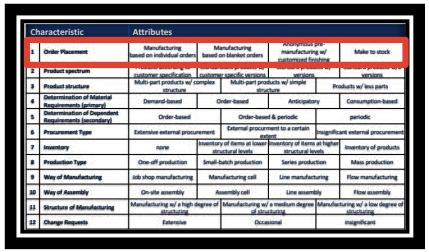
Characteristic		Attributes			
1	**Order Placement**	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2	**Product spectrum**	Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
3	**Product structure**	Multi-part products w/ complex structure	Multi-part products w/ simple structure	Products w/ less parts	
4	**Determination of Material Requirements (primary)**	Demand-based	Order-based	Anticipatory	Consumption-based
5	**Determination of Dependent Requirements (secondary)**	Order-based	Order-based & periodic	periodic	
6	**Procurement Type**	Extensive external procurement	External procurment to a certain extent	Insignificant external procurement	
7	**Inventory**	none	Inventory of items at lower structural levels	Inventory of items at higher structural levels	Inventory of products
8	**Production Type**	One-off production	Small-batch production	Series production	Mass production
9	**Way of Manufacturing**	Job shop manufacturing	Manufacturing cell	Line manufacturing	Flow manufacturing
10	**Way of Assembly**	On-site assembly	Assembly cell	Line assembly	Flow assembly
11	**Structure of Manufacturing**	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring	Manufacturing w/ a low degree of structuring	
12	**Change Requests**	Extensive	Occasional	insignificant	

1 - ORDER PLACEMENT



Characteristic	Attributes			
1 Order Placement	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2 Product spectrum	customer specification	customer-specific versions	[illegible] versions	versions
3 Product structure	Multi-part products w/ complex structure	Multi-part products w/ simple structure		Products w/ less parts
4 Determination of Material Requirements (primary)	Demand-based	Order-based	Anticipatory	Consumption-based
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12 Change Requests	Extensive	Occasional		insignificant

Manufacturing based on individual orders

Manufacturing based on blanket orders

Anonymous pre-manufacturing w/ customized finishing

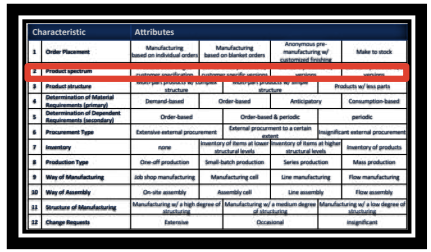
Make to stock

Known ⟷ Unknown

Type, time & quantity of the order

Charac-teristics	Manufacturing will only start after an order is received	Framework purchase order w/ total quantity (per period) exists & specific orders are placed freely thourghout the planning period	Modular componets are manufactured w/o direct purchase orders & finished products are manufactured after an order is received	Manufacturing starts w/o any specific order and finished goods are stored in warehouses
Pro	• Safe & solid planning possible • Less inventory • Less administrative costs	• For customer: •favorable purchase price •Less inventory • For supplier: •stable demand & solid planning •High capacity utilization • Less administrative costs	• Safe & solid planning for the components • Relatively high capacity utilization • Short finishing of final products	• Safe & solid planning • Short delivery time • High capacity utilization
Con	• Long manufacturing lead times • Low capacity utilization of resources	• Random placement of purchase orders possible	• Product modularity necessary • Demand for final products may fluctuate	• High inventory costs

2 - PRODUCT SPECTRUM



Characteristic	Attributes			
1 Order Placement	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2 Product spectrum	customer-specific design	customer-specific versions	versions	versions
3 Product structure	Multi-part products w/ complex structure	Multi-part products w/ simple structure		Products w/ less parts
4 Determination of Material Requirements (primary)	Demand-based	Order-based	Anticipatory	Consumption-based
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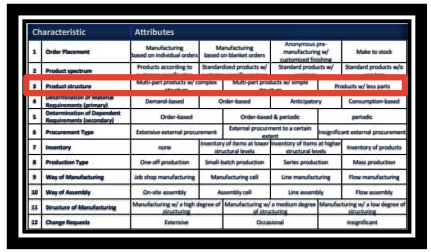
12 Change Requests	Extensive	Occasional		insignificant

Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
Highly specified			*Non-specified*
Product specification by the customer			

Charac-teristics	Products are designed based on customer´s desires and requirements	There is a standard product that may be adapted to customer´s desires & requirements	There are only standard products w/ well-defined versions	There is only one standard product
Pro	• Unique products • Less inventory costs	• Customer satisfaction thanks to customer-specific products • Stable planning • High capacity utilization	• Safe & solid planning for the components • Relatively high capacity utilization • Short delivery time	• Safe & solid planning • Short delivery time • High capacity utilization • Less inventory costs
Con	• Long manufacturing lead times • Low capacity utilization of resources	• Higher inventory costs	• Demand for final products may fluctuate	• No customer-specific products

3 - PRODUCT STRUCTURE



Characteristic		Attributes			
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2	Product spectrum	Products according to	Standardized products w/	Standard products w/	Standard products w/o
3	Product structure	Multi-part products w/ complex	Multi-part products w/ simple	Products w/ less parts	
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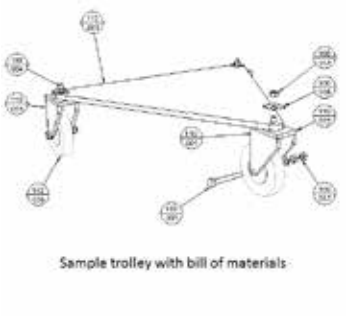
12	Change Requests	Extensive	Occasional	insignificant	

# of hierarchical steps in BOM

>5	*3-5*	*<3*
Multi-part products w/ complex structure	Multi-part products w/ simple structure	(Simple) products w/ less parts
>500	*25-500*	*<25*

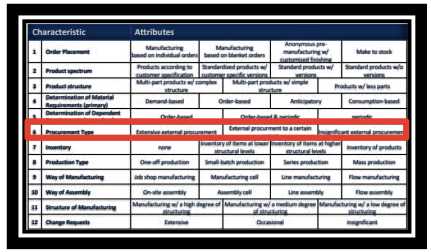
# of BOM positions



Sample trolley with bill of materials

Bill of Materials

6 - PROCUREMENT TYPE



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12	Change Requests	Extensive	Occasional		insignificant

Criterion: share of outsourced parts

Extensive external procurement

- < 80%

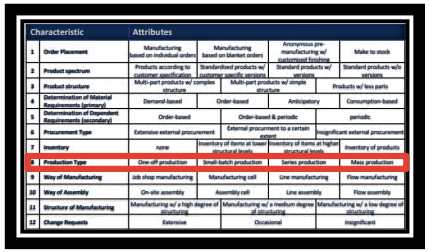
External procurement to a certain extent

- 10 - 80%

Insignificant external procurement

- > 10%

8 - PRODUCTION TYPE



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12 Change Requests	Extensive	Occasional		insignificant

# of products per manufacturing order

few *<50* *>50* *large*

One-off production	Small-batch production	Series production	Mass production

1 *<12* *<24* *continuous*

frequency of manufacturing orders p.a.

9 - WAY OF MANUFACTURING
JOB SHOP MANUFACTURING

Characteristic	Attributes			
1 Order Placement	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2 Product spectrum	customer specification	customer-specific versions	[illegible] versions	versions
3 Product structure	Multi-part products w/ complex structure	Multi-part products w/ simple structure	Products w/ less parts	
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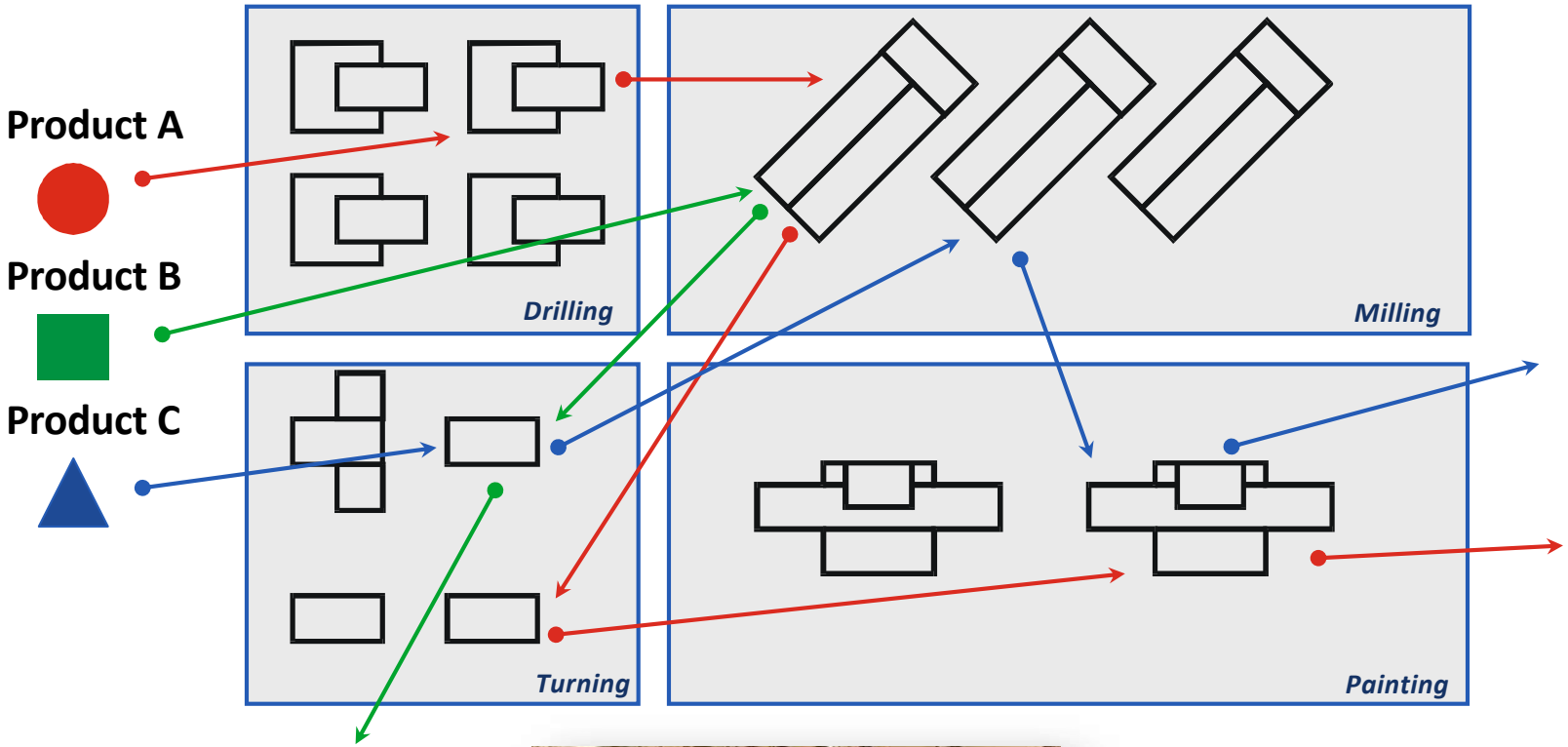
12 Change Requests	Extensive	Occasional	insignificant	

Operation-oriented



9 - WAY OF MANUFACTURING / ASSEMBLY
MANUFACTURING / ASSEMBLY CELL

	Characteristic	Attributes			
1	Order Placement	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2	Product spectrum	Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
3	Product structure	Multi-part products w/ complex structure	Multi-part products w/ simple structure		Products w/ less parts
4	Determination of Material Requirements (primary)	Demand-based	Order-based	Anticipatory	Consumption-based
5	Determination of Dependent Requirements (secondary)	Order-based	Order-based & periodic		periodic
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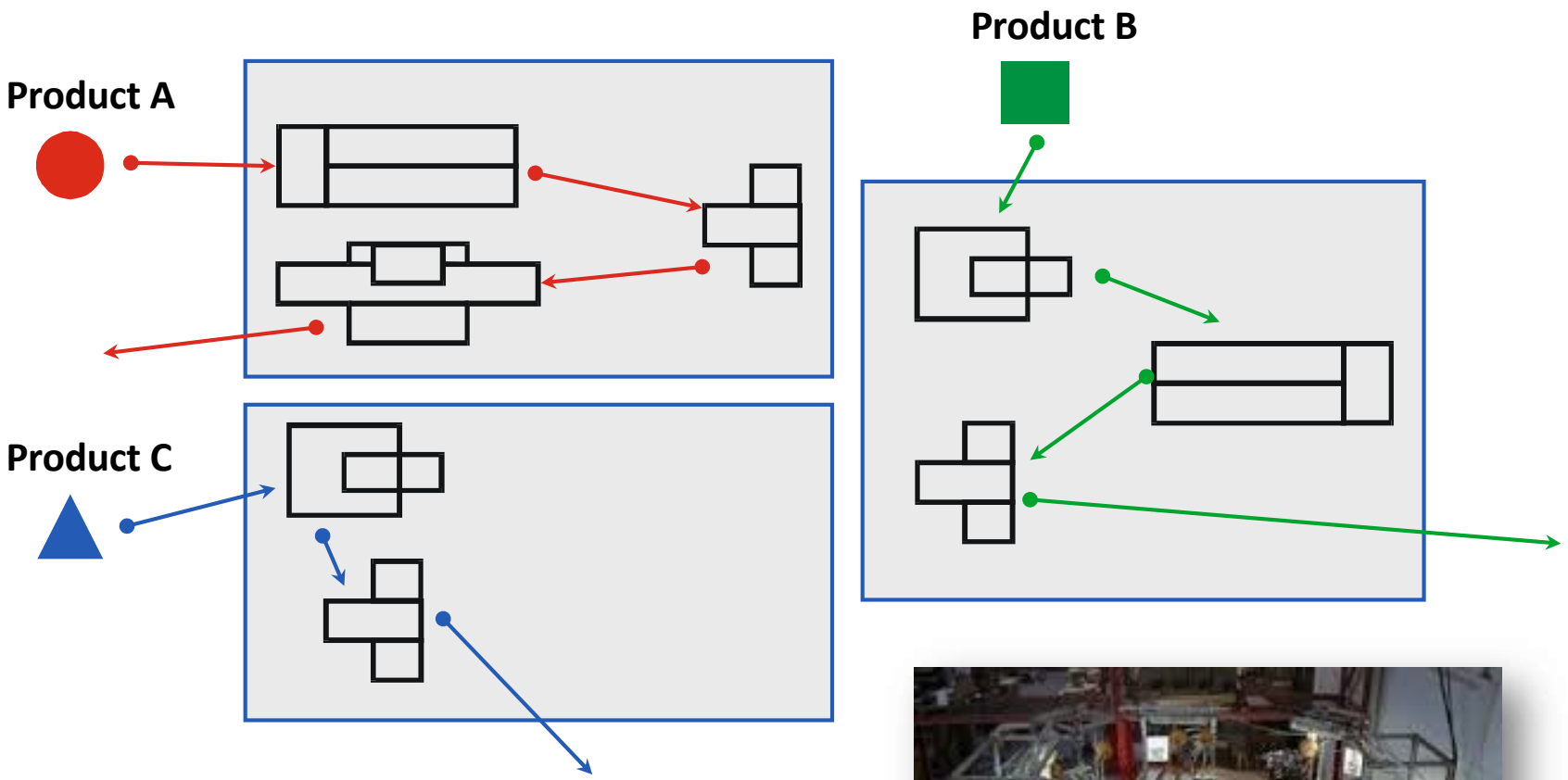
12	Change Requests	Extensive	Occasional		insignificant



9 - WAY OF MANUFACTURING / ASSEMBLY LINE MANUFACTURING / ASSEMBLY

	Characteristic	Attributes			
1	Order Placement	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2	Product spectrum	Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
3	Product structure	Multi-part products w/ complex structure	Multi-part products w/ simple structure		Products w/ less parts
4	Determination of Material Requirements (primary)	Demand-based	Order-based	Anticipatory	Consumption-based
5	Determination of Dependent Requirements (secondary)	Order-based	Order-based & periodic		periodic
6	Procurement Type	Extensive external procurement	External procurement to a certain extent		Insignificant external procurement
7	Inventory	none	Inventory of items at lower structural levels	Inventory of items at higher structural levels	Inventory of products
8	Production Type	One-off production	Small-batch production	Series production	Mass production
9	Way of Manufacturing	Job shop manufacturing	Manufacturing cell	Line manufacturing	Flow manufacturing
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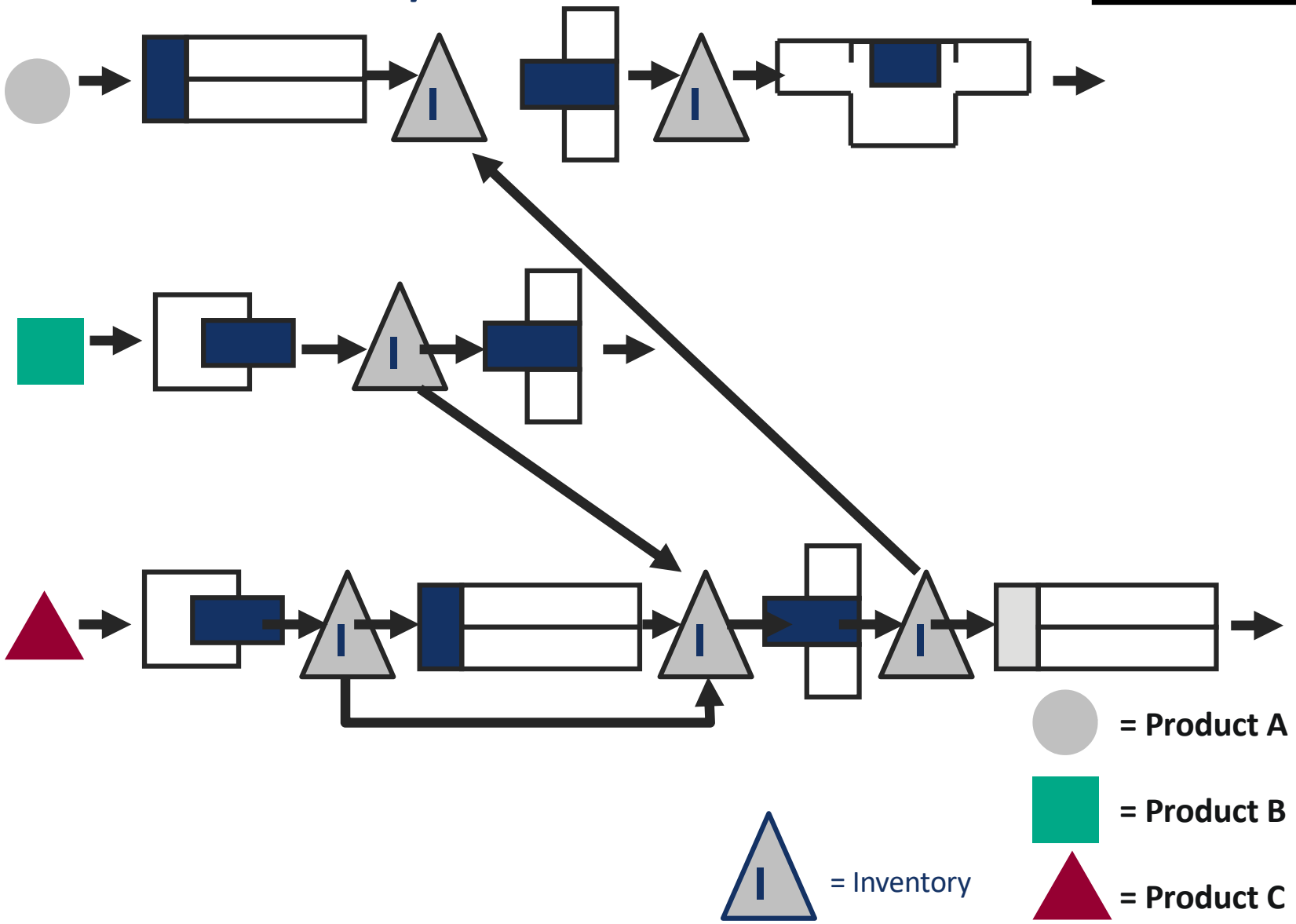
11	Structure of Manufacturing	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring		Manufacturing w/ a low degree of structuring
12	Change Requests	Extensive	Occasional		insignificant



9 - WAY OF MANUFACTURING / ASSEMBLY
FLOW MANUFACTURING / ASSEMBLY

	Characteristic	Attributes			
1	Order Placement	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2	Product spectrum	Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
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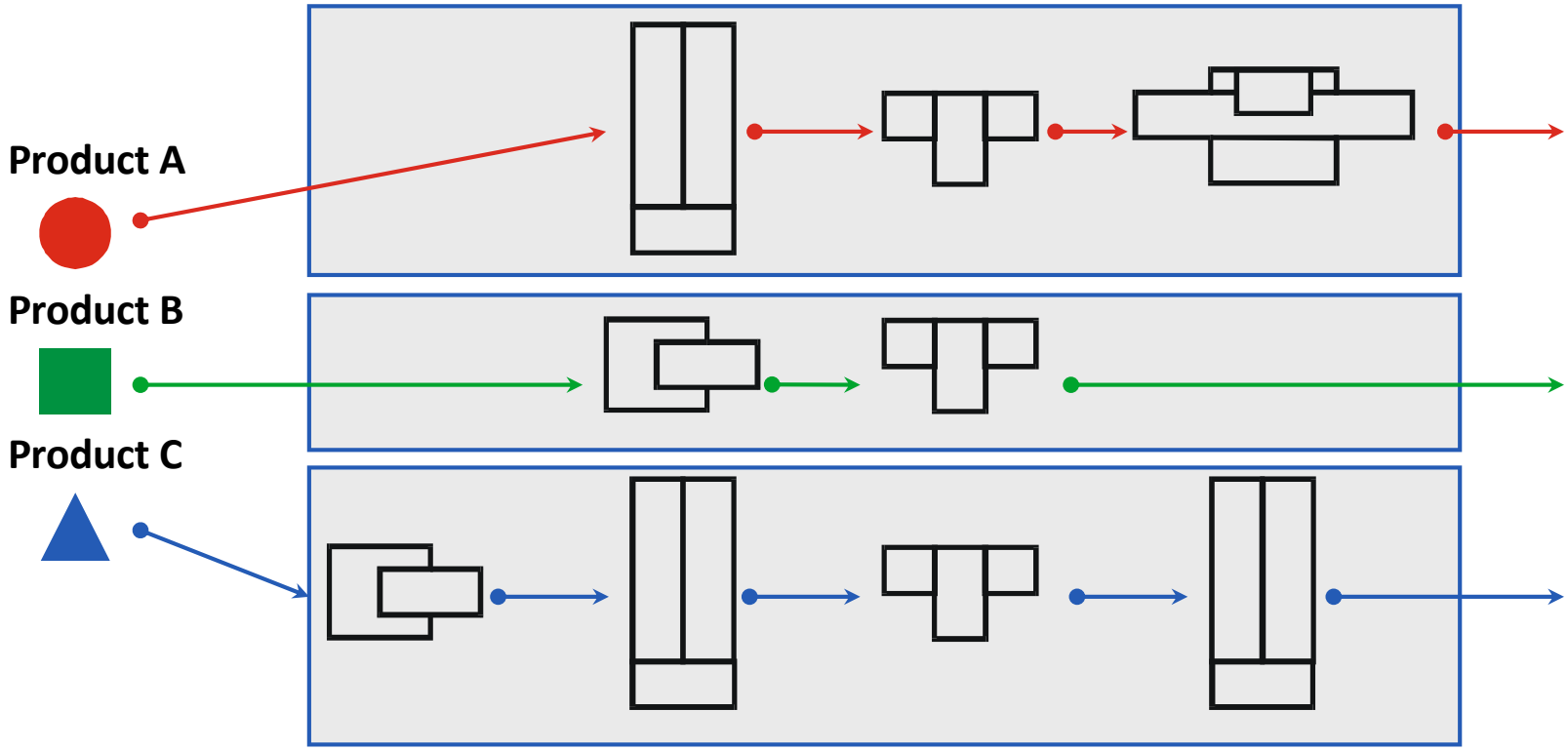
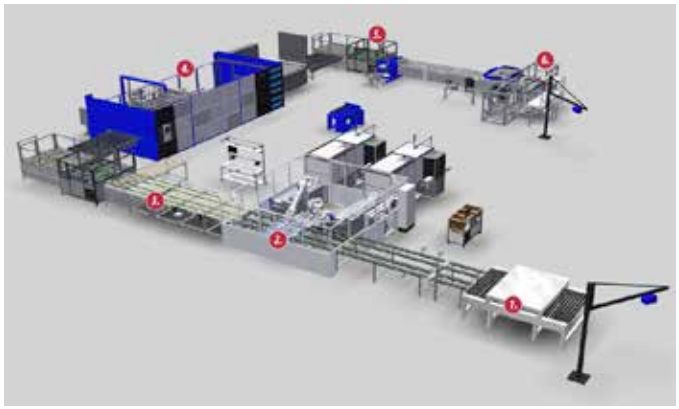
9	Way of Manufacturing	Job shop manufacturing	Manufacturing cell	Line manufacturing	Flow manufacturing
10	Way of Assembly	On-site assembly	Assembly cell	Line assembly	Flow assembly
11	Structure of Manufacturing	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring		Manufacturing w/ a low degree of structuring
12	Change Requests	Extensive	Occasional		insignificant





10 - WAY OF ASSEMBLY
ON-SITE ASSEMBLY

Characteristic		Attributes			
1	Order Placement	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2	Product spectrum	Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
3	Product structure	Multi-part products w/ complex structure	Multi-part products w/ simple structure		Products w/ less parts
4	Determination of Material Requirements (primary)	Demand-based	Order-based	Anticipatory	Consumption-based
5	Determination of Dependent Requirements (secondary)	Order-based	Order-based & periodic		periodic
6	Procurement Type	Extensive external procurement	External procurement to a certain extent		Insignificant external procurement
7	Inventory	none	Inventory of items at lower structural levels	Inventory of items at higher structural levels	Inventory of products
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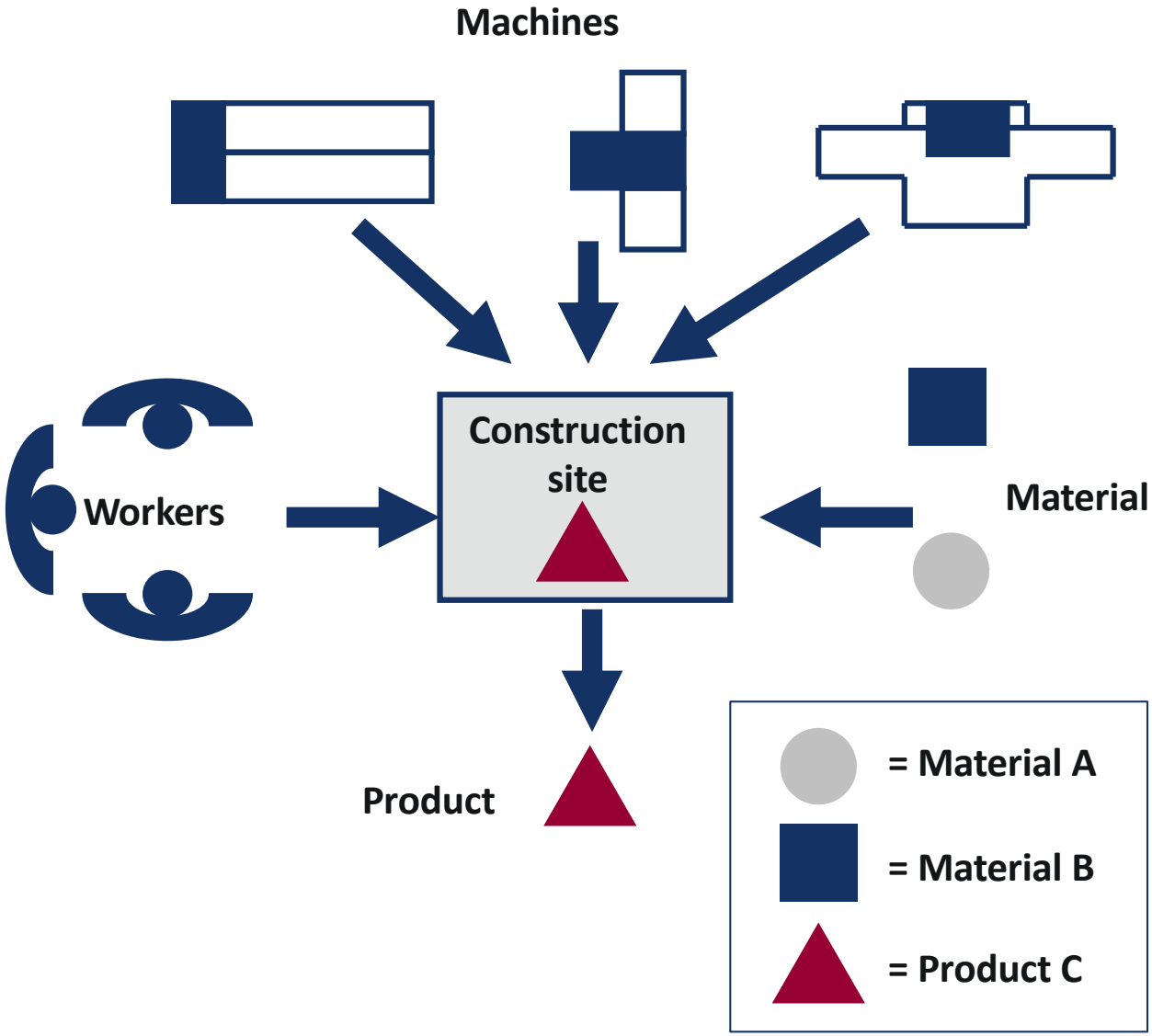
9	Way of Manufacturing	Job shop manufacturing	Manufacturing cell	Line manufacturing	Flow manufacturing
10	Way of Assembly	On-site assembly	Assembly cell	Line assembly	Flow assembly
11	Structure of Manufacturing	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring		Manufacturing w/ a low degree of structuring
12	Change Requests	Extensive	Occasional		Insignificant



11 - STRUCTURE OF MANUFACTURING

Characteristic	Attributes			
1 Order Placement	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2 Product spectrum	Products according to customer specification	Standardized products w/ customer-specific versions	Standard products w/ versions	Standard products w/o versions
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11 Structure of Manufacturing	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring	Manufacturing w/ a low degree of structuring	
12 Change Requests	Extensive	Occasional	insignificant	

Manufacturing w/ a high degree of structuring — *>20*

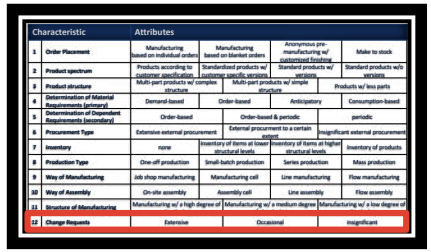
Manufacturing w/ a medium degree of structuring — *10-20*

Manufacturing w/ a low degree of structuring — *<10*

# of subsequent tasks in the route sheet

Route Sheet						
Part	**Spacer sleeve**					
Material	**brass**					
#	**Operation**	**Tool**	**rpm**	**vc**	**Specified size**	**Remarks**
01	Insert part					
02	Punching	Punching chisel PC01	832	40	15.3 mm	
03	Clamping					
04	Turning	Turning chisel TC01	4390	200		Both sides
05	Flip part					
06	Turning	Turning chisel TC01	4390	200	14.5 mm	
07	Centering	NC Tapping device CTD01	2496	40		
08	Drilling	Drill D01	2496	40	5.1 mm	
09	Break edges					

12 – CHANGE REQUESTS



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12	Change Requests	Extensive	Occasional		Insignificant

Criterion: share of orders/order specs being changed after start of production

Extensive

- 100 - 25%

Occasional

- 25 - 0%

Insignificant

- 0%

EXERCISE 2.1

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- Consider a manufacturing company you are familiar with
- Fill out the morphology matrix in spreadsheet S01 by checking the corresponding attributes

MAKE-TO-ORDER MANUFACTURER

Characteristic		Attributes			
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9	**Way of Manufacturing**	Jobshop manufacturing	Work-cell manufacturing	Line manufacturing	Flow manufacturing
10	**Way of Assembly**	On-site assembly	Work-cell assembly	Line assembly	Flow assembly
11	**Structure of Manufacturing**	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring	Manufacturing w/ a low degree of structuring	
12	**Change Requests**	Extensively	Occasionally	insignificant	

ORIGINAL-EQUIPMENT MANUFACTURER

Characteristic		Attributes			
1	**Order Placement**	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2	**Product spectrum**	Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
3	**Product structure**	Multi-part products w/ complex structure	Multi-part products w/ simple structure	Products w/ less parts	
4	**Determination of Material Requirements**	Demand-based	Order-based	Anticipatory	Consumption-based
5	**Determination of Dependent Requirements**	Order-based	Order-based & periodic	periodic	
6	**Procurement Type**	Extensive external procurement	External procurment to a greater extent	Insignificant external procurement	
7	**Inventory**	none	Inventory of items at lower structural levels	Inventory of items at higher structural levels	Inventory of products
8	**Production Type**	One-off production	Small-batch production	Series production	Mass production
9	**Way of Manufacturing**	Jobshop manufacturing	Work-cell manufacturing	Line manufacturing	Flow manufacturing
10	**Way of Assembly**	On-site assembly	Work-cell assembly	Line assembly	Flow assembly
11	**Structure of Manufacturing**	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring	Manufacturing w/ a low degree of structuring	
12	**Change Requests**	Extensively	Occasionally	insignificant	

BLANKET-ORDER MANUFACTURER

Characteristic		Attributes			
1	**Order Placement**	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2	**Product spectrum**	Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
3	**Product structure**	Multi-part products w/ complex structure	Multi-part products w/ simple structure	Products w/ less parts	
4	**Determination of Material Requirements**	Demand-based	Order-based	Anticipatory	Consumption-based
5	**Determination of Dependent Requirements**	Order-based	Order-based & periodic	periodic	
6	**Procurement Type**	Extensive external procurement	External procurment to a greater extent	Insignificant external procurement	
7	**Inventory**	none	Inventory of items at lower structural levels	Inventory of items at higher structural levels	Inventory of products
8	**Production Type**	One-off production	Small-batch production	Series production	Mass production
9	**Way of Manufacturing**	Jobshop manufacturing	Work-cell manufacturing	Line manufacturing	Flow manufacturing
10	**Way of Assembly**	On-site assembly	Work-cell assembly	Line assembly	Flow assembly
11	**Structure of Manufacturing**	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring	Manufacturing w/ a low degree of structuring	
12	**Change Requests**	Extensively	Occasionally	insignificant	

MAKE-TO-STOCK MANUFACTURER

Characteristic		Attributes			
1	**Order Placement**	Manufacturing based on individual orders	Manufacturing based on blanket orders	Anonymous pre-manufacturing w/ customized finishing	Make to stock
2	**Product spectrum**	Products according to customer specification	Standardized products w/ customer specific versions	Standard products w/ versions	Standard products w/o versions
3	**Product structure**	Multi-part products w/ complex structure	Multi-part products w/ simple structure	Products w/ less parts	
4	**Determination of Material Requirements**	Demand-based	Order-based	Anticipatory	Consumption-based
5	**Determination of Dependent Requirements**	Order-based	Order-based & periodic	periodic	
6	**Procurement Type**	Extensive external procurement	External procurment to a greater extent	Insignificant external procurement	
7	**Inventory**	none	Inventory of items at lower structural levels	Inventory of items at higher structural levels	Inventory of products
8	**Production Type**	One-off production	Small-batch production	Series production	Mass production
9	**Way of Manufacturing**	Jobshop manufacturing	Work-cell manufacturing	Line manufacturing	Flow manufacturing
10	**Way of Assembly**	On-site assembly	Work-cell assembly	Line assembly	Flow assembly
11	**Structure of Manufacturing**	Manufacturing w/ a high degree of structuring	Manufacturing w/ a medium degree of structuring	Manufacturing w/ a low degree of structuring	
12	**Change Requests**	Extensively	Occasionally	insignificant	

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LOCATION SELECTION

MOTIVATION FOR LOCATION PLANNING

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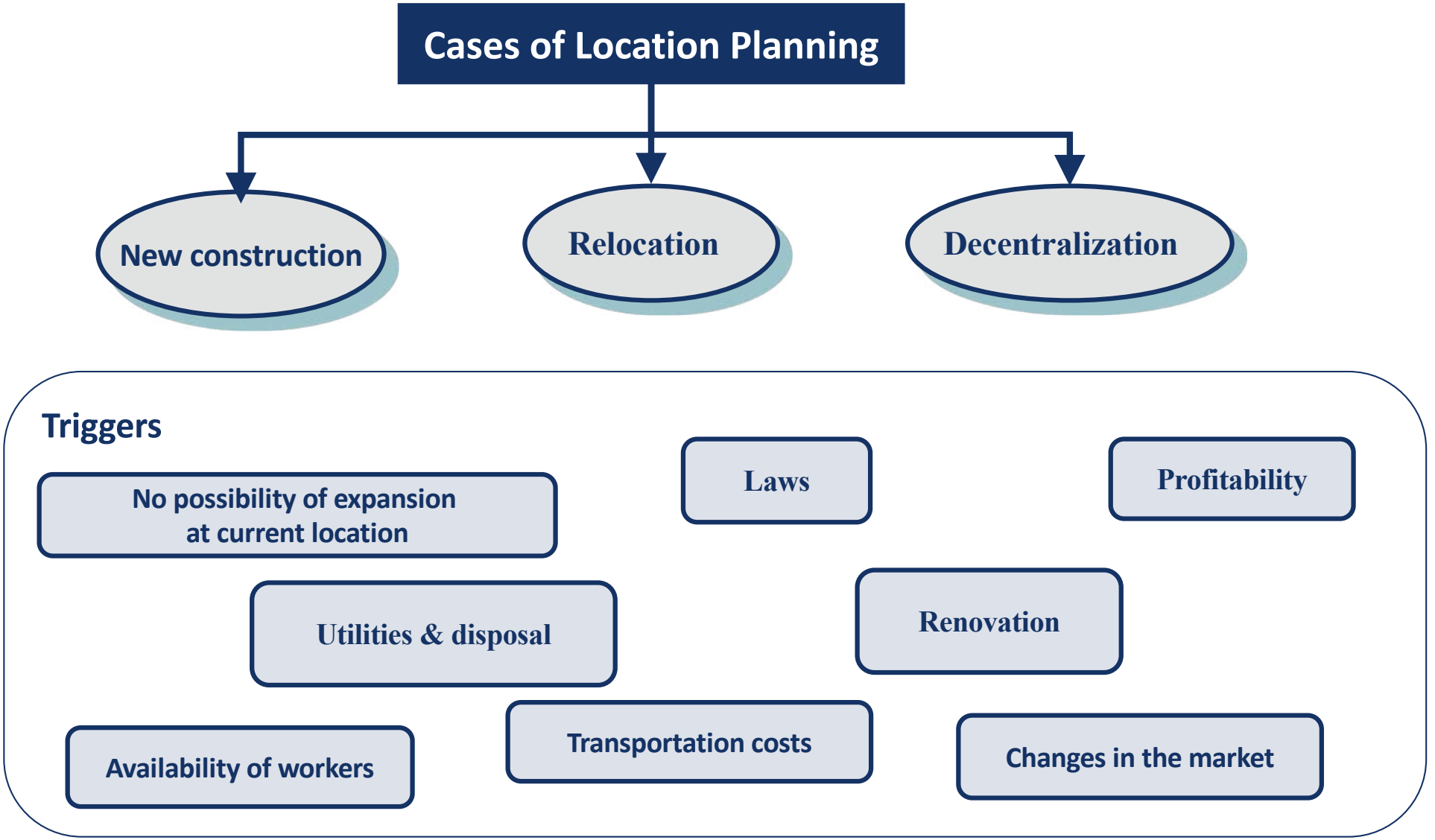

PROCEDURE OF LOCATION PLANNING – MULTI-CRITERIA DECISION ANALYSIS

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Corporate Goals

Description of Location Requirements

	Minimum-requirements > T*	Minimum-requirements <T*	Mandatory requir.
global			
regional			
local			

T* Threshold Value

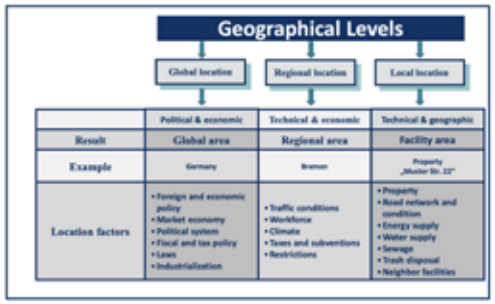
Classification System

Location Factors

Locations

Description of Locations

- Local location factors
- Regional location factors
- Global location factors



Final Selection

Evaluation Methods

Benefit-Value Analysis

W1	G1	E1	N1
W2	G2	E2	N2
W3	G3	E3	N3
W4	G4	E4	N4
W5	G5	E5	N5

Singular Methods

Optimization of transportation costs

Ranking

1	Location A	432 Pts.
2	Location B	408 Pts.
...	.....	.....

„optimal“ location

LOCATION FACTORS

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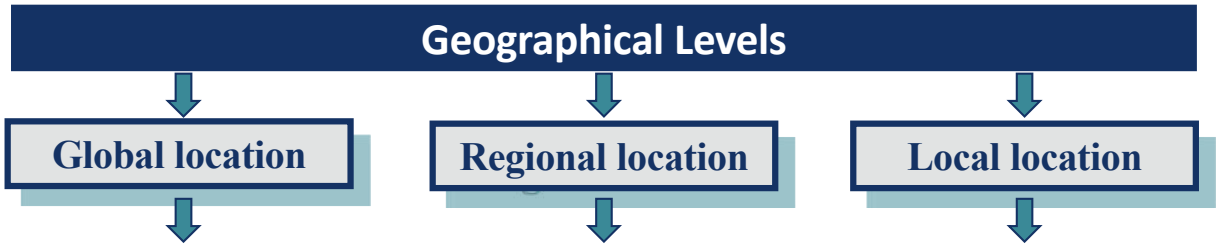

	Political & economic	Technical & economic	Technical & geographic
Result	**Global area**	**Regional area**	**Facility area**
Example	Germany	Bremen	Property „Muster Str. 22“
Location factors	• Foreign and economic policy • Market economy • Political system • Fiscal and tax policy • Laws • Industrialization	• Traffic conditions • Workforce • Climate • Taxes and subventions • Restrictions	• Property • Road network and condition • Energy supply • Water supply • Sewage • Trash disposal • Neighbor facilities

Examples

Mandatory	• stable political system • free market economy • Free market interactions • Free flow of goods	• Road network • Railroad network • Availability of properties • Availability of skilled workforce on short notice	• Road connection • Position in industrial district • Water connection • sewage • Property size > 100.000 m^2
Minimum	• GDP-share of industry > 40% • Share of blue-collar workers > 10% • Working hours per year ≥ 1,550 hours • Avg. wage per month < 3,500 €	• Subventions > 15% • Share of blue-collar workers > 10% • Avg. wages of white-collar workers < 35 €/h • Avg. Wages of skill workers < 25 €/h • Ratio of skilled and unskilled workers > 1 • Property price < 40 €/m^2	• Property price < 40 €/m^2 • Ground water level > 4m • Property gradient < 1% • Electricity: voltage > 10kV • Power > 8 MW

EVALUATION METHOD: VALUE ANALYSIS

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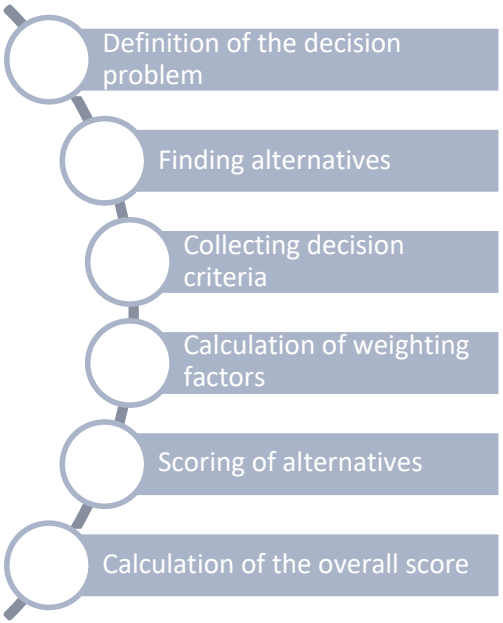
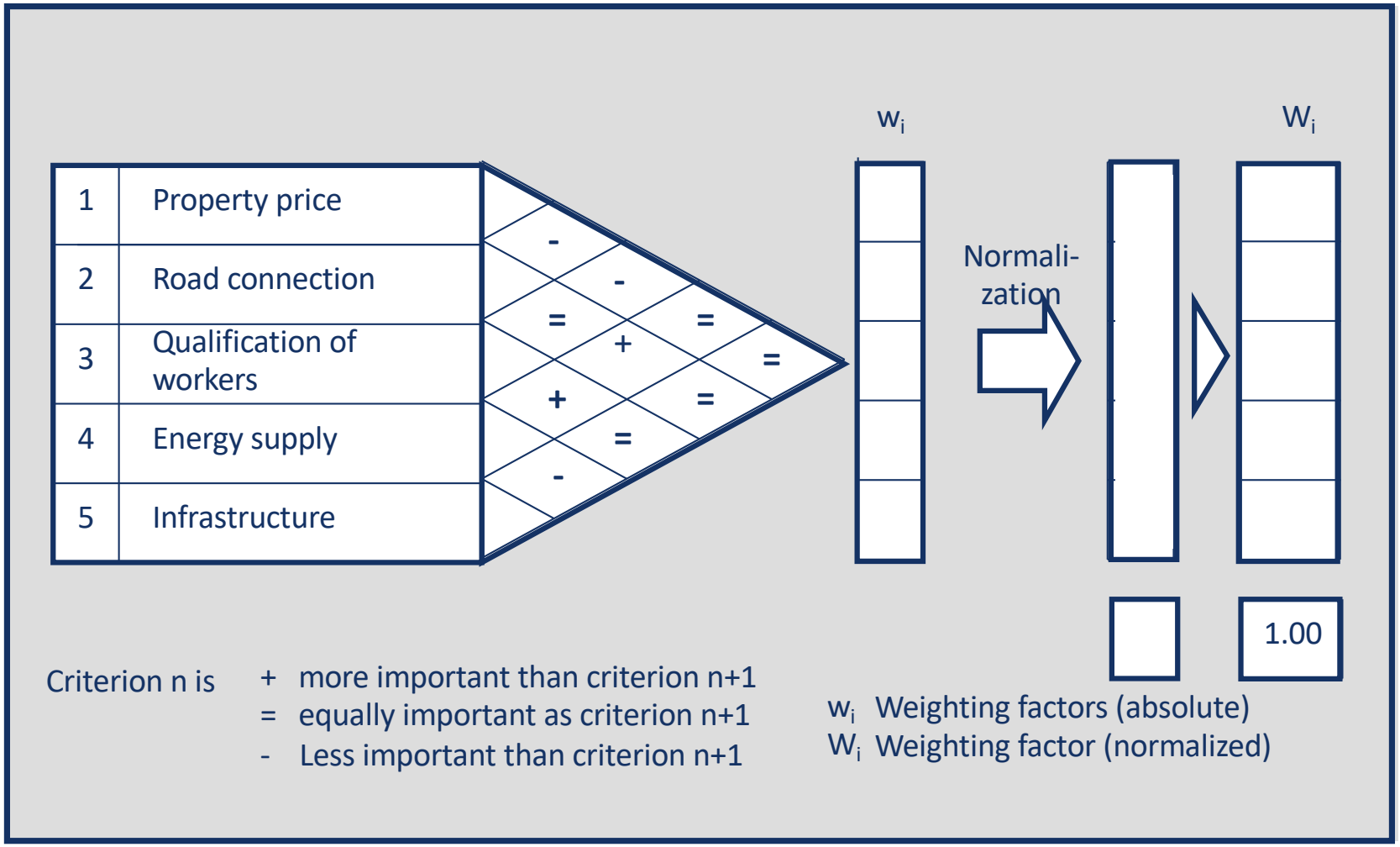


Bv Benefit value

$Bv_{ij} = W_i * F_i$ $F_i = [1...10]$

				Ideal Option		Option 1		Option 2		Option 3	
Criteria Group	Overall Weight	**Criterion C_i**	**Weight W_i**	F_i	Bv_{ij}	F_i	Bv_{ij}	F_i	Bv_{ij}	F_i	Bv_{ij}
Property size	3.5%	Property size	**3.5%**	7	24.5	5	17.5	4	14.0	2	7.0
Property price	10.9%	Property price	**10.9%**	7	76.3	6	65.4	5	54.5	5	54.5
Traffic conditions	12.6%	Canals	**5.1%**	7	35.7	6	30.6	5	25.5	3	15.3
		Railroads	**4.9%**	6	29.4	6	29.4	6	29.4	6	29.4
		Roads	**2.6%**	7	18.2	2	5.2	3	7.8	3	7.8
Quality of property	7.3%	Soil bearing capacity	**2.2%**	4	8.8	6	13.2	3	6.6	1	2.2
		Planarity	**2.3%**	4	9.2	5	11.5	7	16.1	7	16.1
		Form	**2.8%**	7	19.6	6	16.8	4	11.2	4	16.8
Energy and water supply	9.2%	Electricity	**4.0%**	5	20.0	5	20.0	5	20.0	3	15.0
		Gas	**2.0%**	6	12.0	3	6.0	5	10.0	5	10.0
		Other energy	**1.9%**	5	9.5	2	3.8	3	5.7	1	1.9
		Water	**1.3%**	7	9.1	6	7.8	6	7.8	7	9.1
Proximity to markets	17.4%	Sales market	**6.6%**	7	46.2	5	33.0	4	26.4	4	26.4
		Supply / Component market	**10.8%**	7	75.6	5	54.0	6	64.8	5	54.0
Workforce	19.0%	Job market condition	**8.0%**	7	56.0	5	40.0	1	8.0	1	8.0
		Housing	**4.8%**	4	19.2	6	28.8	2	9.6	2	9.6
		Training opportunities	**2.5%**	3	7.5	6	15.0	7	17.5	4	10.0
		Social conditions	**2.3%**	5	11.5	4	9.2	4	9.2	4	9.2
		Cultural richness	**1.4%**	4	5.6	2	1.8	2	1.8	3	3.2
Other costs	20.1%	Investments	**9.2%**	3	27.6	1	9.2	7	64.4	2	18.4
		Operating costs	**10.9%**	5	54.5	4	43.6	4	43.6	4	43.6
Sum	**100%**		**100%**	**572.0**		**461.8**		**453.9**		**358.4**	
Ranking				**1**		**2**		**3**		**4**	

PAIRWISE COMPARISON



EXERCISE 2.2

- Consider the location selection for a supplier of aircrafts components, i.e. wings
- Following cities are taken into consideration
  - Bremen
  - Berlin
  - Munich

- Conduct a value analysis to find the best location by using spreadsheet S02
  - Define 5-8 decision criteria
  - Calculate the weighting factors
  - Score the alternatives
  - Calculate the individual overall scores

EXERCISE 2.2 (CONT´D)

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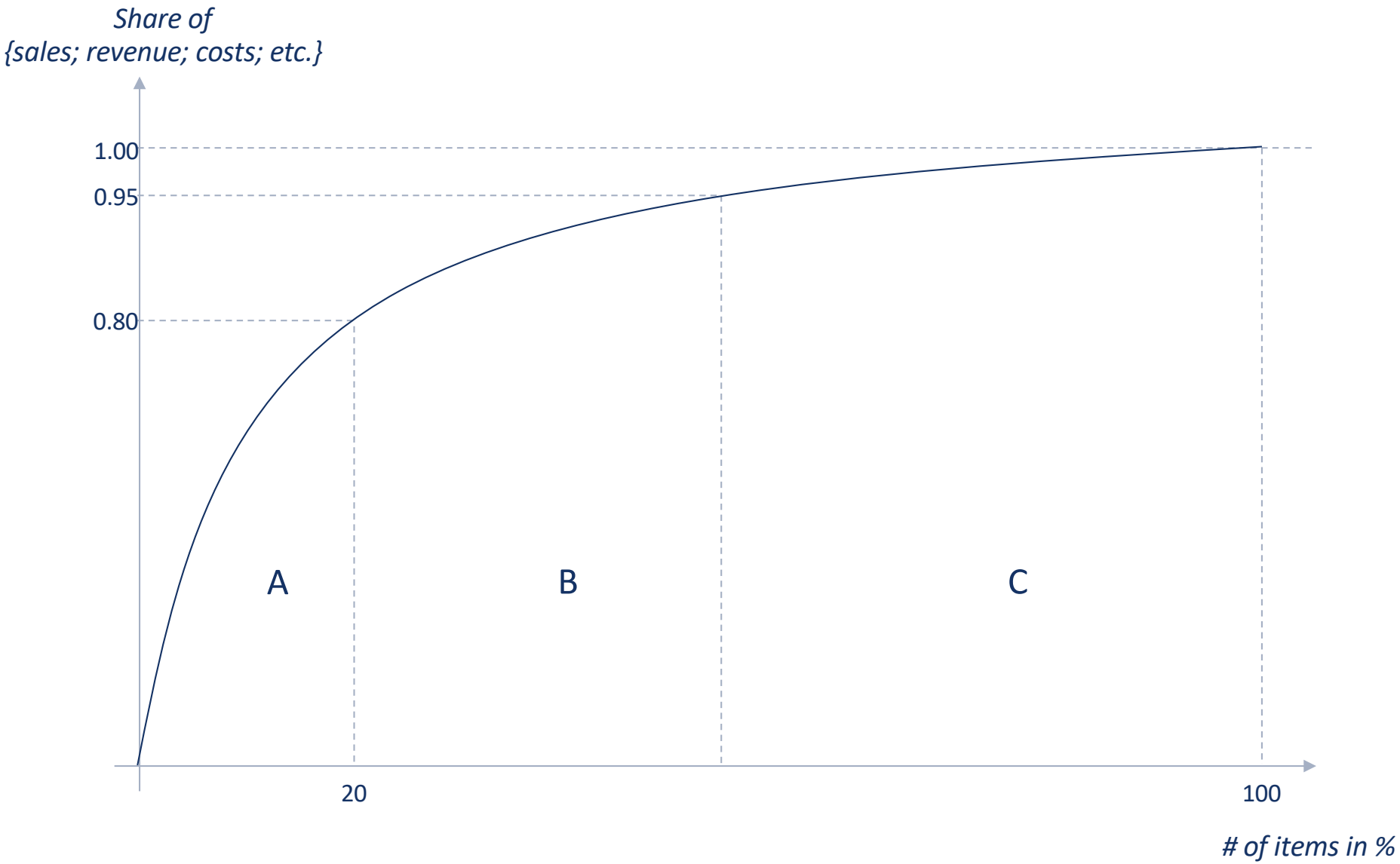
Following **information** were put together

- Traffics conditions:
  - All three cities have airports; Munich has the biggest one; new airport in Berlin is still in progress
  - Only Bremen has a convenient access to seaports
  - Bremen and Berlin have logistics centers ("Güterverkehrszentrum - GVZ"), Bremen GVZ is the biggest
  - Number of customers located in the cities are as follows: Bremen 5, Munich 5, and Berlin 5
- Workforce:
  - the Universities in Bremen and Munich have specialized aerospace engineering programs
  - Level of wages is the highest in Munich, followed by Berlin
  - Apartments are scarce and expensive in Munich, Bremen being the least expensive city
  - Cost of living is the highest in Munich, followed by Berlin
- Taxes & Subventions
  - The Economic Development Agency in Bremen has the most attractive financial support program for aerospace, followed by Munich
- Property
  - Property rental fees are as follows; Munich 8 €/m^2, Berlin 7 €/m^2 and Bremen 6 €/m^2
  - Ground water level in Bremen is the highest, followed by Berlin
- Energy supply
  - Berlin offers the most attractive electricity prices for industrial customers (4 Cents/kWh), followed by Bremen (4.5 Cents/kWh) and Munich (5 Cents/kWh)
- Neighbor facilities
  - Bremen has a dense cluster of aerospace companies and research institutions
  - Munich has prestigious research facilities and companies in the defense industry

LOCATION PRIORITIZATION

ABC ANALYSIS



ABC ANALYSIS: PROCEDURE

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Gather data on figures (sales; cost; etc.) for the items (product; location, etc.) to be analyzed

↓

Calculate the total value of the figure per item

↓

Calculate the share of each item among all other items

↓

Calculate the cumulative share of each item

↓

Sort from high to low

↓

Define the intervals (A; B; C)

EXERCISE 2.3

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- Conduct an ABC analysis based on the contribution margin of the individual locations using spreadsheet S03
- Create an appropriate diagram for this ABC analysis
- Interpret the results

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THANK YOU!