



IMA 11th Business Case Competition

—Fun Sports: The Inventory Management Practice of an E-commerce Company

Case Analysis

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CONTENTS

- 1 Case review and summary of our work
- 2 Optimization of procurement scheme
- 3 Advantages and disadvantages of outsourcing
- 4 Solutions to improve outsourcing

Seize market opportunities

Save on purchasing costs

Guarantee product quality



Case review and summary of our work

A large green triangle pointing right, containing a white number '1'. It is surrounded by several smaller, hollow green triangles of various sizes and orientations, some pointing towards the center and others away from it.

1

Macro analysis

Micro analysis

Model analysis

Review and mind map

Online shopping

Online shopping has become a common consumption habit with the rise of the Internet.



Leading Company

There is a lack of leading enterprises. The market share of a single enterprise is low, and most of them are export-oriented.



Birth Policy

With the continuous liberalization of the national fertility policy, market demand for toys will continue to expand.



Entry Barriers

There are some relatively strong competitors in the segmented market and most companies have relatively low registered capital.



Online Sales

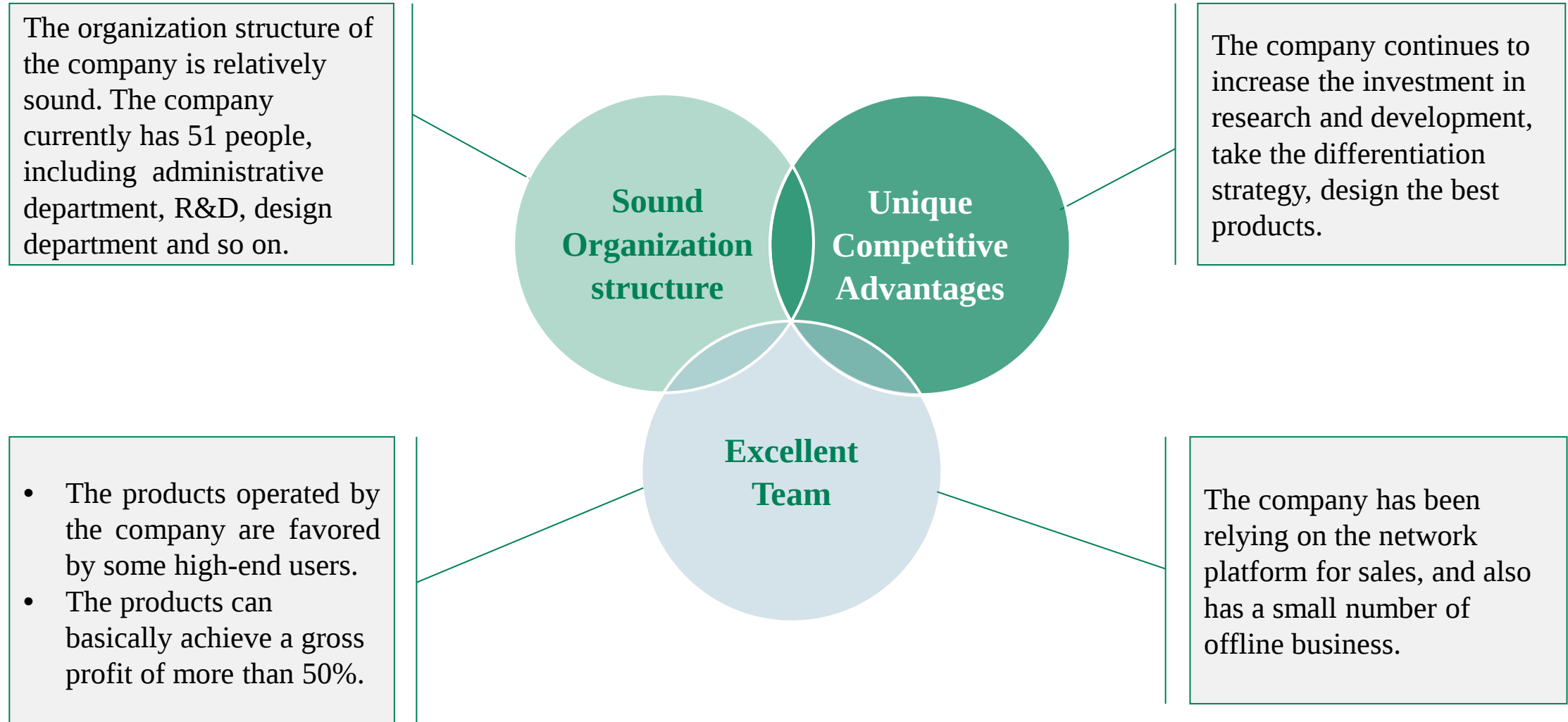
Most toy online stores mainly focus on distribution (wholesale sales or distribution).



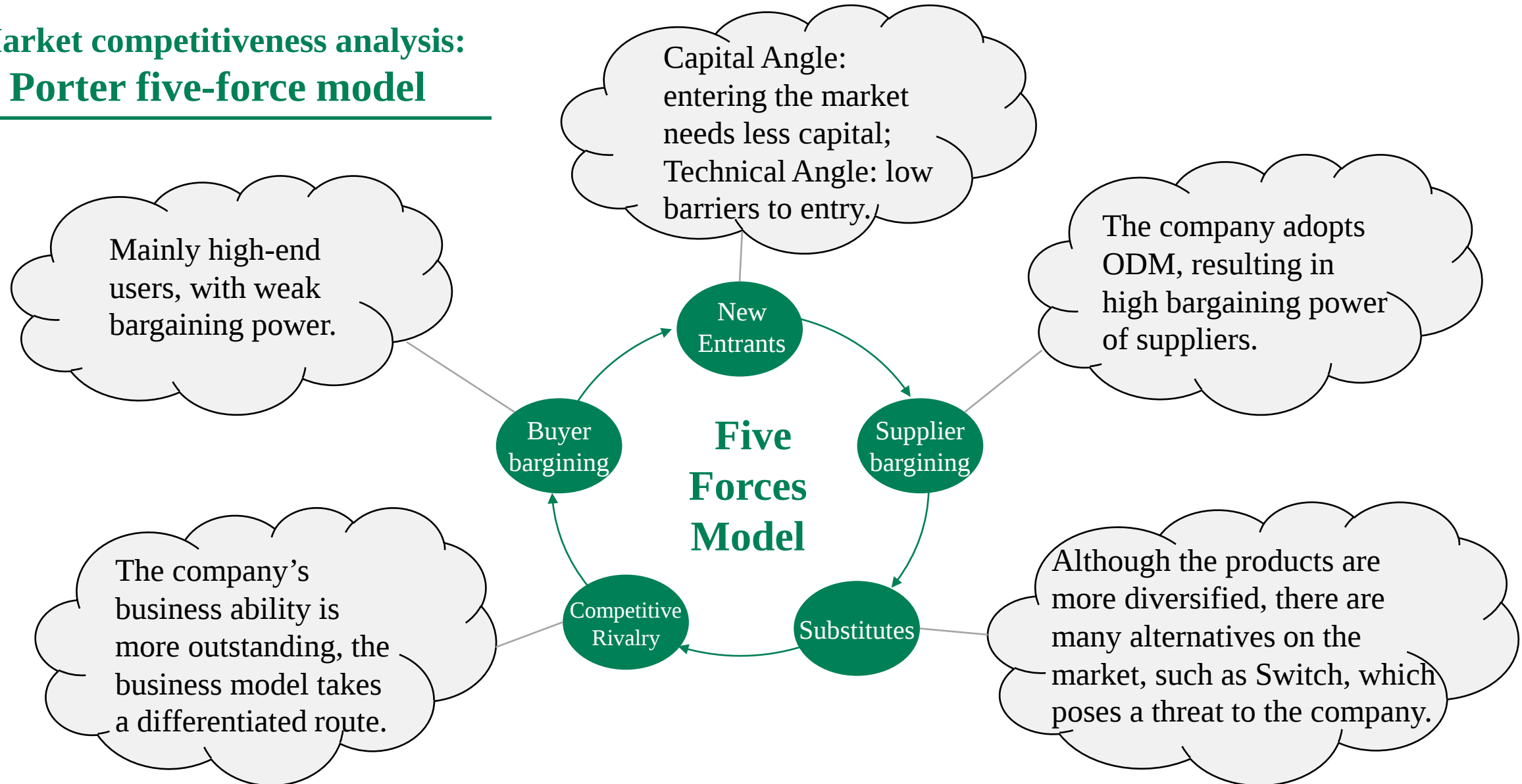
Industrial Model

The Original Equipment Manufacturer (OEM) model or the Original Design Manufacturer (ODM) model is more common. Some companies develop the Own Branding & Manufacturing (OBM) model.





Market competitiveness analysis: Porter five-force model



Status of production **outsourcing**

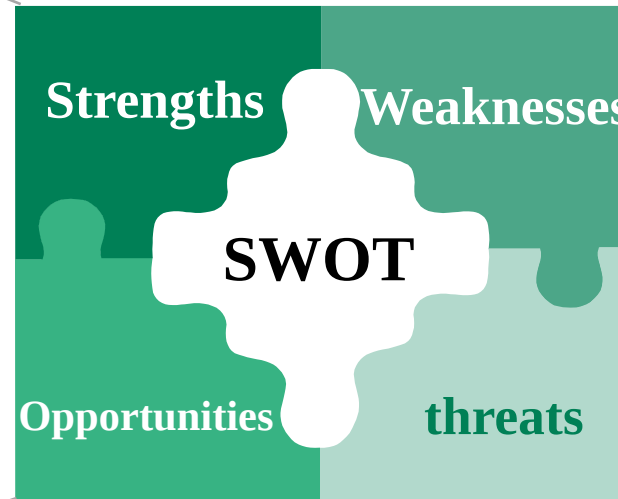
SWOT model

- ✓ The EOQ model reduce the production cost.
- ✓ Reduce the cost of self-built production line, reduce storage costs.
- ✓ The organization structure can adapt to the future industrial model reform.

- Funding is limited, with no self-built production line.
- Low bargaining power with the OEM factory.
- Product quality assurance is low.

- ✓ Internet development provides opportunities for the digital and intelligent management of inventory.
- ✓ Strengthen strategic cooperation with suppliers

- OEM problems may take the opportunity to increase production costs.
- Industrial mode is diversified, coming from the threat of competition of independent design, procurement and production (OBM) management mode.



Summary

From the perspective of market competition, the status quo is optimistic,

From an outsourcing perspective, the situation is **not very optimistic!**

Problem 1



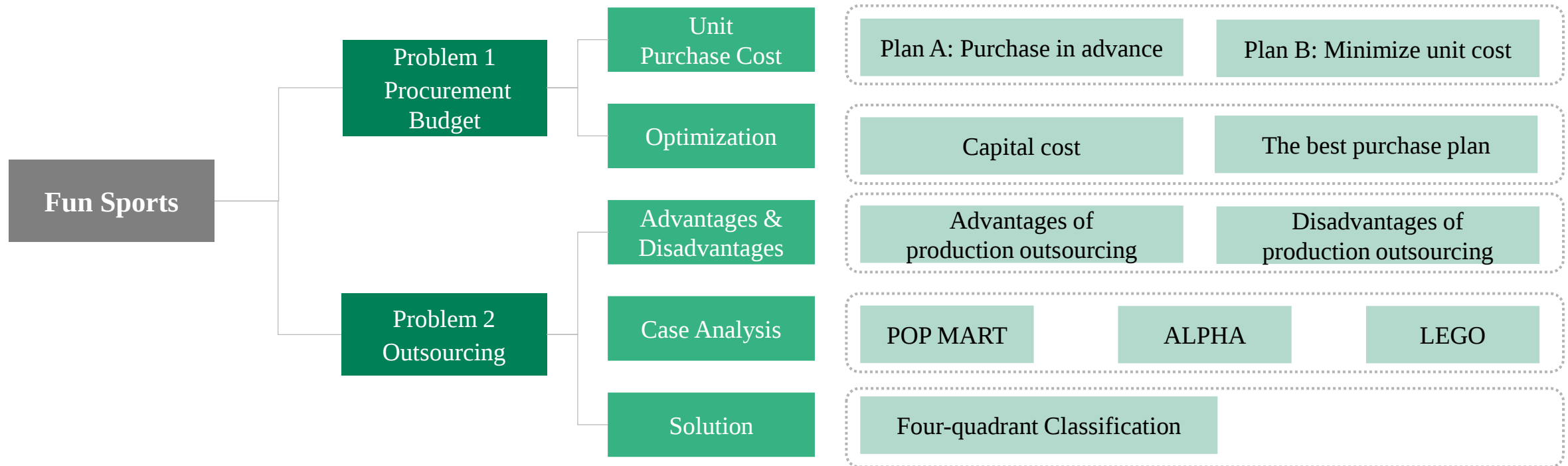
The unit purchase cost of the detachable large-size slide increases significantly during the peak sales season. Could you please explain why the unit purchase cost will increase in May and October? Zhang Ying said, “It might be more beneficial to the company if these orders exceeding the normal purchase volume can be produced in advance,” do you think she is right? Please re-compile the purchase budget according to her ideas, and then calculate the increased revenue for the company according to the re-compiled procurement budget. (Assuming that the company’s capital cost is 10%, the unit product cost under normal circumstances is RMB1,628).

Problem 2



According to your experience and the information in this case, please analyze the advantages and disadvantages of production outsourcing. If the company still chooses production outsourcing, please use the case data or collect successful cases from other companies to help FS propose a plan to improve the issues in production outsourcing.

Summary of our work





Optimization of procurement scheme

2

Unit purchase cost

Plan A: Purchase in advance

Plan B: Minimize unit cost

The best purchase plan

The rule of purchase cost:

- RMB **1628**/piece (including materials and parts) for normal order under **400** pieces per month.
- If the order exceeds the normal capacity, an extra cost of RMB **200**/piece will be required.

Marginal purchase cost:

n is monthly purchase quantity

$$MC = \begin{cases} 1628, & n \leq 400, \\ 1828, & n > 400. \end{cases}$$



Purchase amount:

$$C = \begin{cases} 1628n, & n \leq 400, \\ 1828n - 80000, & n > 400. \end{cases}$$

Unit purchase cost:

$$c = C/n$$

$$c = \begin{cases} 1628, & n \leq 400, \\ 1828 - \frac{80000}{n}, & n > 400. \end{cases}$$

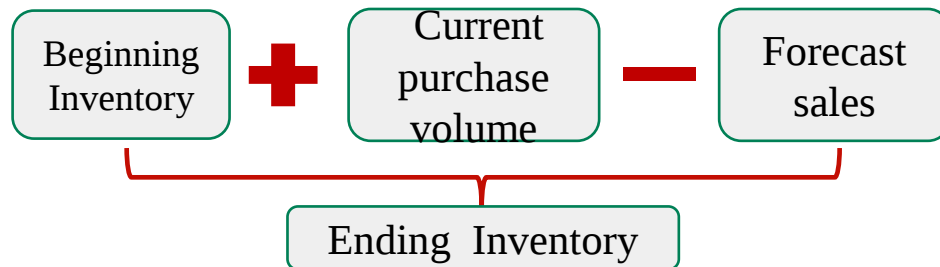
$$400 \times 1628 + (n - 400) \times 1828$$

2020 Procurement Budget of DK-008 Detachable Large Slide: Case

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Beginning inventory (b/d)	208	208	248	256	240	720	256	288	296	224	726	216	3,886
Current purchase volume	220	300	318	304	780	256	352	368	298	782	216	270	4,464
Less: Forecast sales	220	260	310	320	300	720	320	360	370	280	726	270	4,456
Ending inventory (c/d)	208	248	256	240	720	256	288	296	224	726	216	216	3,894
Purchase amount (RMB) ①	358,160	488,400	517,704	494,912	1,345,840	416,768	573,056	599,104	485,144	1,349,496	351,648	439,560	7,419,792
Current purchase volume ②	220	300	318	304	780	256	352	368	298	782	216	270	4,464
Unit cost (RMB) ①/②	1,628	1,628	1,628	1,628	1,725.44	1,628	1,628	1,628	1,628	1,725.70	1,628	1,628	1,662.14

How to calculate the numbers?

Rule: Ending inventory (c/d) of each month is forecasted as **80%** of the sales volume in next month. In May and October will become **100%** of the forecasted sales in next month.



Beginning inventory (b/d) = Ending inventory (c/d) in last month

Ending inventory (c/d) = $\begin{cases} 80\% \times \text{Forecast sales in next month} & \text{(except May and Oct.)} \\ 100\% \times \text{Forecast sales in next month} & \text{(May and Oct.)} \end{cases}$

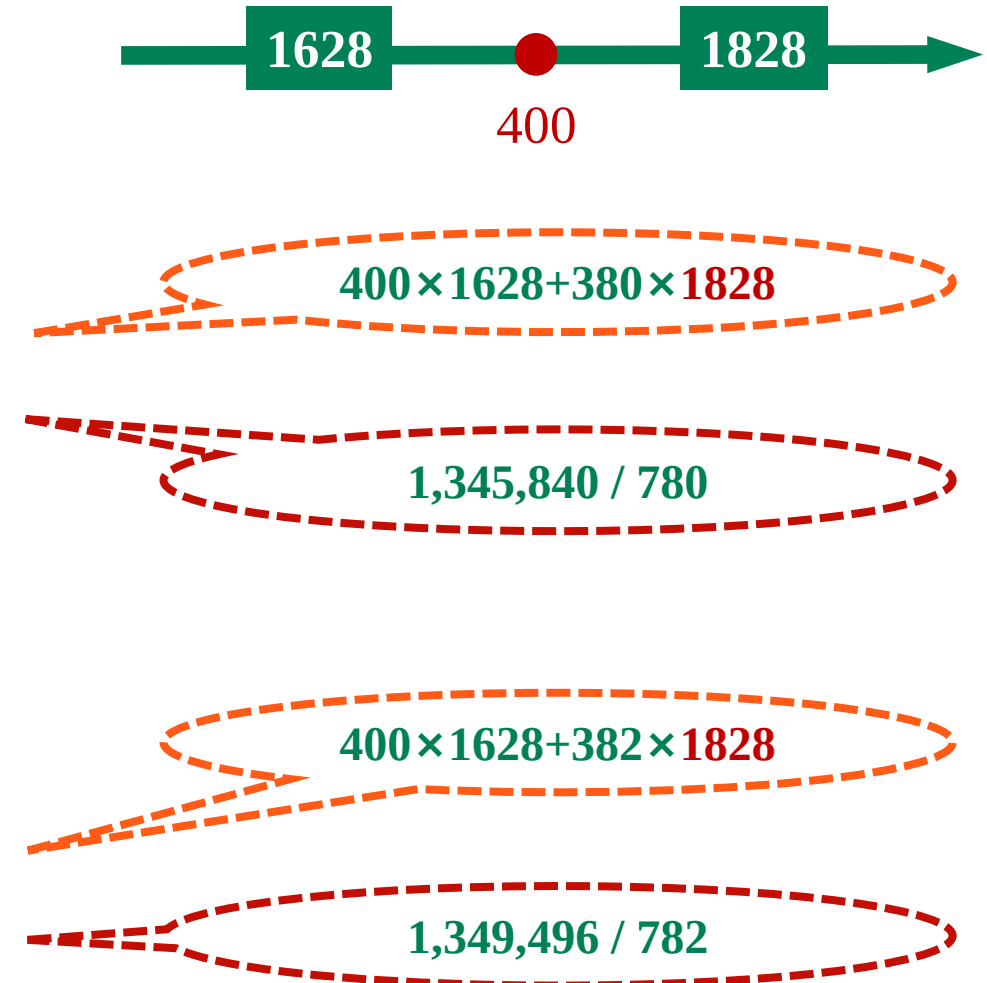
Unit cost = Purchase amount / Current purchase volume

Month	Jan.	Feb.	Mar.
Beginning inventory (b/d)	208	208	248
Current purchase volume ②	220	300	318
Less: Forecast sales	220	260	310
Ending inventory (c/d)	208	248	256
Unit cost (RMB) ①/②	1,628	1,628	1,628
Purchase amount (RMB) ①	358,160	488,400	517,704

Why do the unit purchase costs increase in May and October?

Month	Jan.	Feb.	Mar.	Apr.	May
Beginning inventory (b/d)	208	208	248	256	240
Current purchase volume (2)	220	300	318	304	780
Less: Forecast sales	220	260	310	320	300
Ending inventory (c/d)	208	248	256	240	720
Purchase amount (RMB) (1)	358,160	488,400	517,704	494,912	1,345,840
Unit cost (RMB) (1)/(2)	1,628	1,628	1,628	1,628	1,725.44

Month	Jun.	Jul.	Aug.	Sept.	Oct.
Beginning inventory (b/d)	720	256	288	296	224
Current purchase volume (2)	256	352	368	298	782
Less: Forecast sales	720	320	360	370	280
Ending inventory (c/d)	256	288	296	224	726
Purchase amount (RMB) (1)	416,768	573,056	599,104	485,144	1,349,496
Unit cost (RMB) (1)/(2)	1,628	1,628	1,628	1,628	1,725.70



Total procurement cost: Case

Total purchase cost

=

Purchase amount

+

Storage cost

+

~~Capital cost~~

Storage cost: If entrusted products are not sold out in the month,
we have to pay them extra storage fee of RMB **30**/piece/month.

Note

We do not consider **capital cost** (10% per year) here.
In the end, we will analyze the capital cost.

How to reduce the total procurement cost?

Pain Point: **Unit cost**

Solution: Purchase in advance



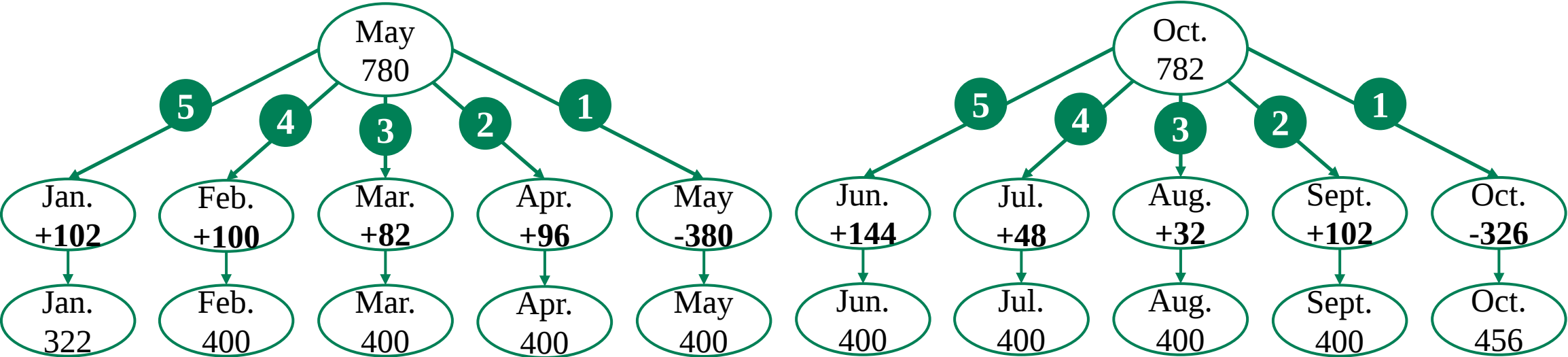
Storage cost

Capital cost

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Current purchase volume (Case)	220	300	318	304	780	256	352	368	298	782	216	270	4464
Range of current purchase volume can increase	180	100	82	96	-	144	48	32	102	-	184	130	-
Current purchase volume (Plan A)	322	400	400	400	400	400	400	400	400	456	216	270	4464
Current purchase volume (Plan B)	378	400	400	400	400	400	400	400	400	400	216	270	4464

Plan A: Purchase in advance

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Current purchase volume (Case)	220	300	318	304	780	256	352	368	298	782	216	270	4464
Range of current purchase volume can increase	180	100	82	96	-	144	48	32	102	-	184	130	-
Current purchase volume (Plan A)	322	400	400	400	400	400	400	400	400	456	216	270	4464
Difference	+102	+100	+82	+96	-380	+144	+48	+32	+102	-326	0	0	0



Total procurement cost: Case VS. Plan A

Plan A	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Beginning inventory (b/d)	208	310	450	540	620	720	400	480	520	550	726	216	5,740
Current purchase volume	322	400	400	400	400	400	400	400	400	456	216	270	4,464
Less: Forecast sales	220	260	310	320	300	720	320	360	370	280	726	270	4,456
Ending inventory (c/d)	310	450	540	620	720	400	480	520	550	726	216	216	5,748
Storage cost (RMB)	9,300	13,500	16,200	18,600	21,600	12,000	14,400	15,600	16,500	21,780	6,480	6,480	172,440
Unit cost (RMB)	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,652.56	1,628	1,628	1,630.51
Purchase amount (RMB)	524,216	651,200	651,200	651,200	651,200	651,200	651,200	651,200	651,200	753,568	351,648	439,560	7,278,592
Total purchase cost (RMB)	533,516	664,700	667,400	669,800	672,800	663,200	665,600	666,800	667,700	775,348	358,128	446,040	7,451,032

Case	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Storage cost (RMB)	6,240	7,440	7,680	7,200	21,600	7,680	8,640	8,880	6,720	21,780	6,480	6,480	116,820
Purchase amount (RMB)	358,160	488,400	517,704	494,912	1,345,840	416,768	573,056	599,104	485,144	1,349,496	351,648	439,560	7,419,792
Total purchase cost (RMB)	364,400	495,840	525,384	502,112	1,367,440	424,448	581,696	607,984	491,864	1,371,276	358,128	446,040	7,536,612

Storage cost 
+55,620

Purchase amount 
-141,200

Total cost 
-85,580

Total procurement cost: **Case VS. Plan A**

Note

We do not consider **capital cost** (10% per year) here.
In the end, we will analyze the capital cost.

Storage cost 
+55,620

Purchase amount 
-141,200

Total cost 
-85,580

Plan B: Minimize unit cost

In Plan A, current purchase volume of Oct. is **456**, higher than 400, the unit cost is not the lowest.

If we can increase current purchase volume of Jan. by 56, then the current purchase volume of Oct. will be **400**, then the **unit cost** and **purchase amount** will be the **lowest**.

Plan B
Unit cost
1628
(Minimum)

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Current purchase volume (Case)	220	300	318	304	780	256	352	368	298	782	216	270	4464
Current purchase volume (Plan A)	322	400	400	400	400	400	400	400	400	456	216	270	4464
Current purchase volume (Plan B)	378	400	400	400	400	400	400	400	400	400	216	270	4464

Total procurement cost: Plan A VS. Plan B

Plan A	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Storage cost (RMB)	9,300	13,500	16,200	18,600	21,600	12,000	14,400	15,600	16,500	21,780	6,480	6,480	172,440
Purchase amount (RMB)	524,216	651,200	651,200	651,200	651,200	651,200	651,200	651,200	651,200	753,568	351,648	439,560	7,278,592
Total purchase cost (RMB)	533,516	664,700	667,400	669,800	672,800	663,200	665,600	666,800	667,700	775,348	358,128	446,040	7,451,032

Plan B	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Beginning inventory (b/d)	208	366	506	596	676	776	456	536	576	606	726	216	6,244
Current purchase volume	378	400	400	400	400	400	400	400	400	400	216	270	4,464
Less: Forecast sales	220	260	310	320	300	720	320	360	370	280	726	270	4,456
Ending inventory (c/d)	366	506	596	676	776	456	536	576	606	726	216	216	6,252
Storage cost (RMB)	10,980	15,180	17,880	20,280	23,280	13,680	16,080	17,280	18,180	21,780	6,480	6,480	187,560
Unit cost (RMB)	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,628	1,628
Purchase amount (RMB)	615,384	651,200	651,200	651,200	651,200	651,200	651,200	651,200	651,200	651,200	351,648	439,560	7,267,392
Total purchase cost (RMB)	626,364	666,380	669,080	671,480	674,480	664,880	667,280	668,480	669,380	672,980	358,128	446,040	7,454,952

Storage cost
+15,120



Purchase amount
-11,200



Total cost
+3,920



Total procurement cost: **Plan A VS. Plan B**

Note

We do not consider **capital cost** (10% per year) here.
In the end, we will analyze the capital cost.

Storage cost 
+15,120

Purchase amount 
-11,200

Total cost 
+3,920

Case VS. Plan A VS. Plan B

	Case	Plan A	Plan B
Storage cost	116,820	172,440	187,560
Purchase amount	7,419,792	7,278,592	7,267,392
Total cost	7,536,612	7,451,032	7,454,952

$$7,536,612 - 7,451,032 = 85,580$$

If we do **not** consider **capital cost**, we should choose **Plan A**.

Total cost will reduce **85,580** RMB.

The increased revenue for the company is **85,580** RMB.

Case VS. Plan A VS. Plan B

Now we take **capital cost** (10% per year) into consideration.

Marginal analysis

Purchase in advance

Unit cost

Storage cost

Capital cost

Example: If the purchase of **one** product in **May** is advanced to **April**...

Item	Amount (RMB)
Purchase cost	1,628
Purchase cost reduce by	200
Storage cost	30
Capital cost	13.82
Total cost reduce by	156.18

$$1828 - 1628$$

$$(1628 + 30) \times (10\% / 12)$$

$$200 - 30 - 13.82$$

Purchase in advance	Storage cost per month (including capital cost)	Purchase cost (including capital cost)	Total cost (including capital cost)	Save cost (1828 - Total cost)
1 month	30.25	1,641.57	1,671.82	156.18
2 months	30.50	1,655.25	1,716.00	112.00
3 months	30.76	1,669.04	1,760.55	67.45
4 months	31.01	1,682.95	1,805.47	22.53
5 months	31.27	1,696.97	1,850.77	-22.77
6 months	31.53	1,711.11	1,896.44	-68.44
7 months	31.79	1,725.37	1,942.49	-114.49
8 months	32.06	1,739.75	1,988.93	-160.93
9 months	32.33	1,754.25	2,035.75	-207.75

The results may be affected by reserved decimals.

Example: If we purchase one product **three months in advance**....

- **Total storage cost** = $30 \times (1 + 10\%/12) + 30 \times (1 + 10\%/12)^2 + 30 \times (1 + 10\%/12)^3$
 $= 30.25 + 30.50 + 30.76 = 91.51$
- **Purchase cost** = $1,628 \times (1 + 10\%/12)^3 = 1,669.04$
- **Total cost** = $91.51 + 1,669.04 = 1,760.55$
- **Save cost** = $1,828 - 1,760.55 = 67.45$

**Plan A
is better
than Plan B**

Unit purchase cost

Plan A: Purchase in advance

Plan B: Minimize unit cost

The best purchase plan

Purchase in advance	Storage cost per month (including capital cost)				Purchase cost (including capital cost)				Total cost (including capital cost)				Save cost (1828 - Total cost)
1 month	30.25				1,641.57				1,671.82				156.18
2 months	30.50				1,655.25				1,716.00				112.00
3 months	30.76				1,669.04				1,760.55				67.45
4 months	31.01				1,682.95				1,805.47				22.53

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum
Current purchase volume (Case)	220	300	318	304	780	256	352	368	298	782	216	270	4464
Current purchase volume (Plan A)	322	400	400	400	400	400	400	400	400	456	216	270	4464
Difference ①	+102	+100	+82	+96	-380	+144	+48	+32	+102	-326	-	-	-
Purchase in advance (month)	4	3	2	1	-	4	3	2	1	-	-	-	-
Unit save cost ②	22.53	67.45	112.00	156.18	-	22.53	67.45	112.00	156.18	-	-	-	-
Total save cost ①×②	2,298.06	6,745	9,184	14,993.28	-	3,244.32	3,237.6	3,584	15,930.36	-	-	-	59,216.62

If we consider **capital cost**, we still should choose **Plan A**.

Total cost will reduce **59,216.62** RMB.

The increased revenue for the company is **59,216.62** RMB.

The results may be affected by reserved decimals.



Advantages and disadvantages of outsourcing

3

Production outsourcing

Advantage of production outsourcing

Disadvantage of production outsourcing

Overall analysis framework

Reason

Fierce
Competitors

Limited Funds
and technology

Brand effect

Strong R&D
Capabilities

Production outsourcing

Vertical integration($\times$)

Horizontal integration($\checkmark$)

Outcome

Advantages:

1. An efficient way to run the company
2. Focus on the core competitiveness
3. Budget more accordingly

Disadvantages:

1. Weak bargaining power
2. Weak qualities control capabilities

Consideration

Financial

Liquidity

Profitability

Non-financial

Specialist skills

Short-term
&
long-term

An efficient way to run the company

Make (×)

OR

Buy (✓)

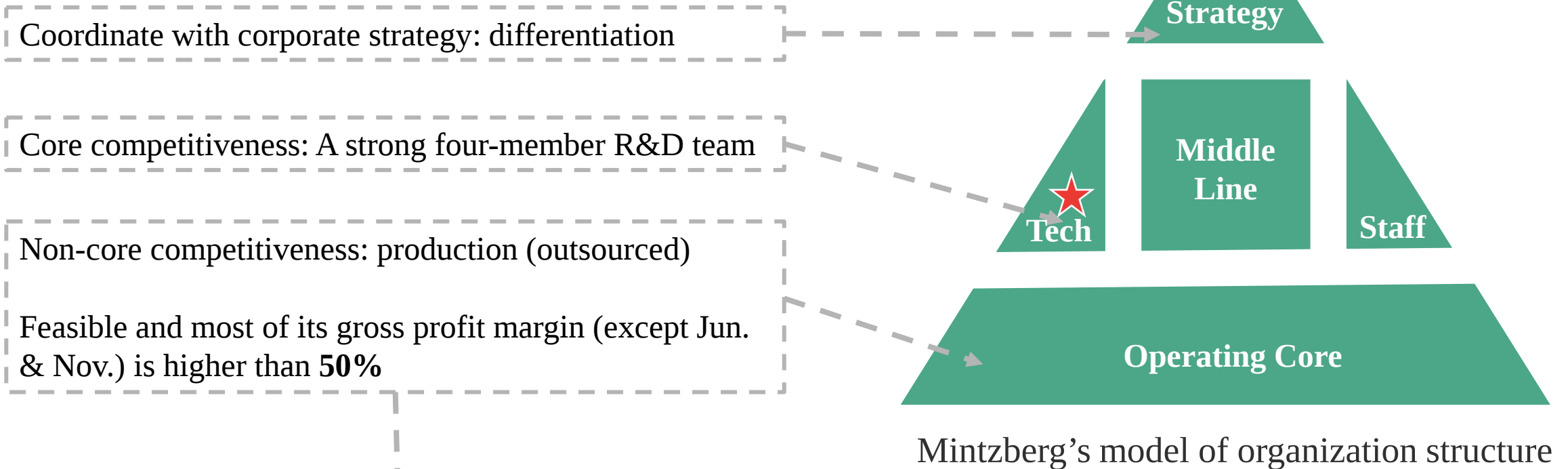
- High operational risk
-- lack of working capital
- Unpredictable return

- Asset-light strategy : low risk
--pay the debts and inventory reserve
- Saving fixed cost and so on

- Lack of experience
- Unfeasible
- Unpredictable but could be considered

- Flexibility: satisfied FS's demand
- Immediate solution
- Need to have a further consideration of the limited capacity

Focus on FS's core competitiveness: R&D and design



Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Gross profit margin	52.12%	52.23%	52.09%	52.32%	52.51%	35.05%	49.81%	51.38%	52.65%	53.08%	33.25%	49.12%

Weak bargaining power

For example:

Product	DK-008
Original cost	1,500
Revised cost	1,628
Variance	128A
Rate	8.35%

Reason:

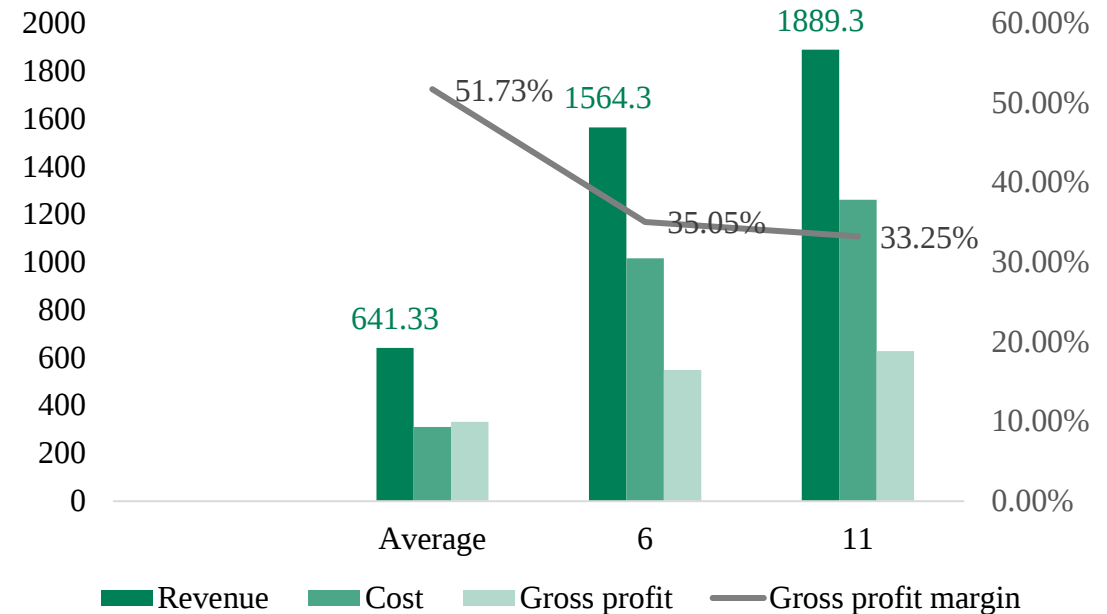
➤ For **large-sized** product:

Over reliance on the single manufacturer
→cost increase dramatically (especially in month Jun. & Nov.)

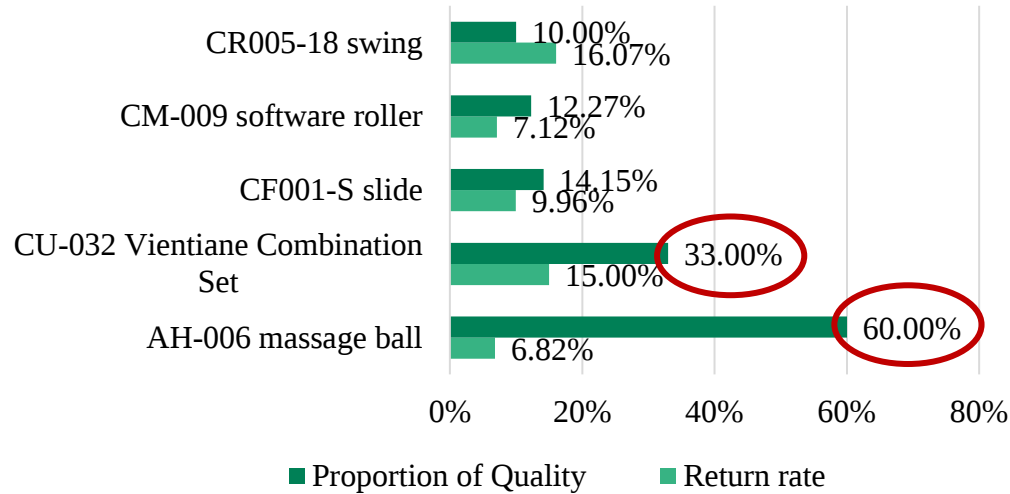
➤ For **small-sized** product:

Low cooperation frequency
→little discount, but stable demand

Outcome : Gross profit decrease dramatically



Month	Revenue (¥ 000')	Cost (¥ 000')	Gross profit (¥ 000')	Gross profit margin
Average	641.33	309.98	331.40	51.73%
Jun.	1,564.30	1,016.00	548.29	35.05%
Nov.	1,889.30	1,261.10	628.20	33.25%



Proportion of Quality higher than 10%:

Products	Return rate	Proportion of Quality	Rate caused by quality
AH-006 massage ball	6.82%	60.00%	4.09%
CU-032 Vientiane Combination Set	15.00%	33.00%	4.95%
CF001-S slide	9.96%	14.15%	1.41%
CM-009 software roller	7.12%	12.27%	0.87%
CR005-18 swing	16.07%	10.00%	1.61%

Weak qualities control capabilities

Unable to control the quality of production process in the whole process

The return reason include a significant proportion of quality.

Especially AH-006 and CU-032.

Loss of revenue and reduced profit

Impact the company's reputation

Loss of customer goodwill



Solutions to improve outsourcing

4

Case Analysis

Purchasing and Selling control flow

Four-quadrant Classification

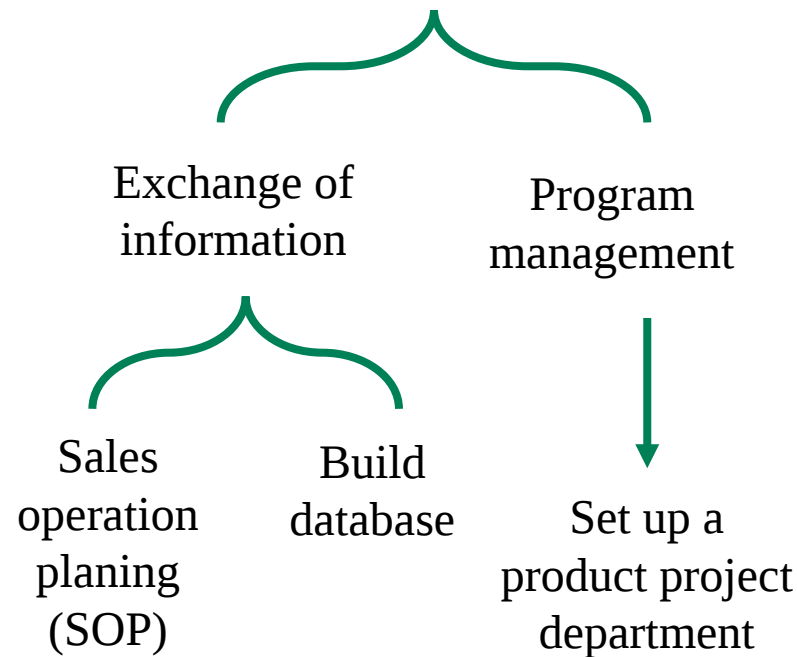
Case analysis (1): POP MART

POP
MART

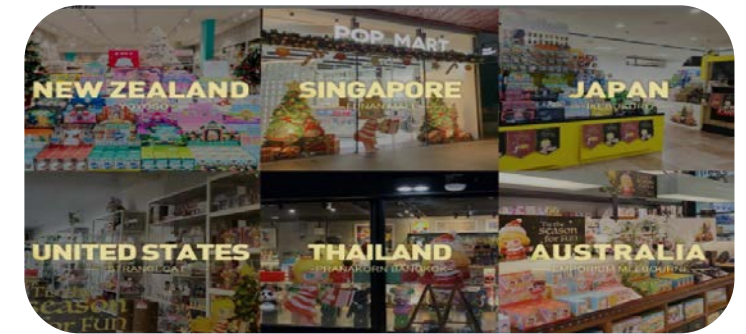
1 Stable link with factories

- Fixed factories
- Long-term cooperative relationship
- KPI assessment mechanism
- Rewards for good-performing factories and **punishes** for bad-performing factories.

2 Flexible supply chain



3 Fine craftsmanship

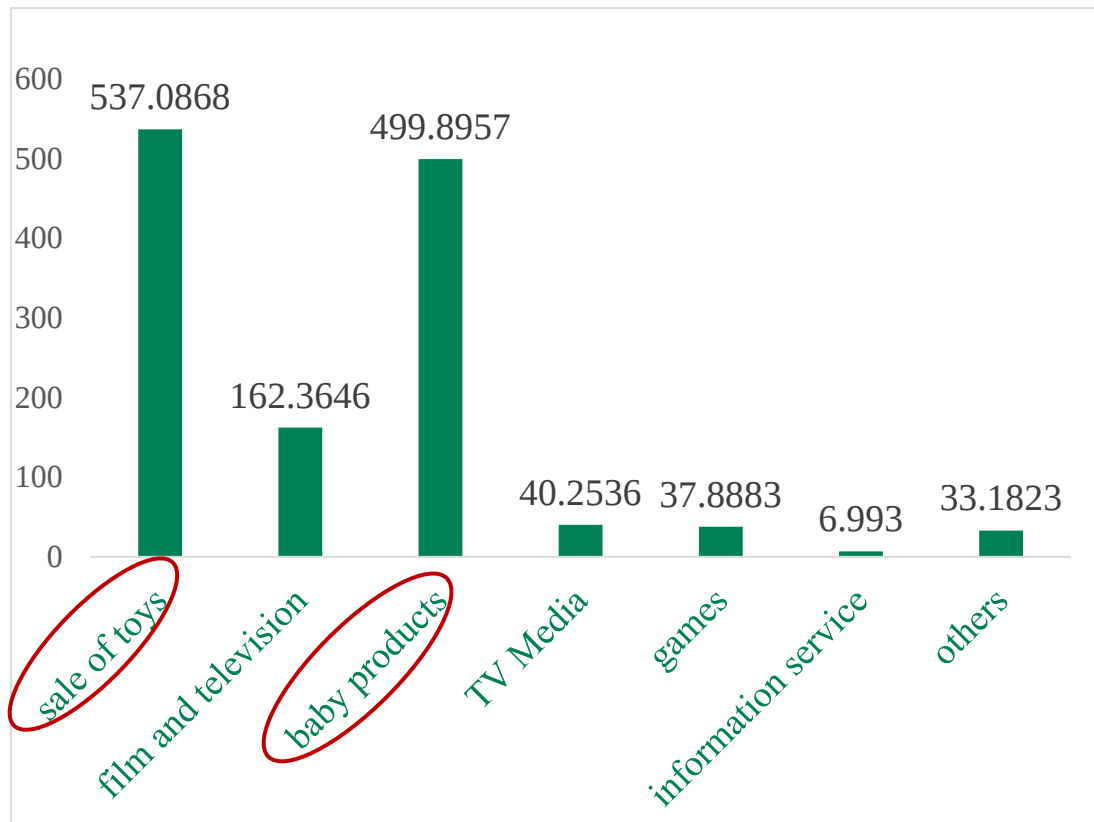


- **Replace:** environmentally friendly materials.
- **Attention:** innovation
new toy categories.
- **Capability:** the level of automation
a global satellite factory.

Case analysis (2): ALPHA



Main revenue in the first half of 2021
Unit: million yuan



Advantages

Optimizing the logistics process

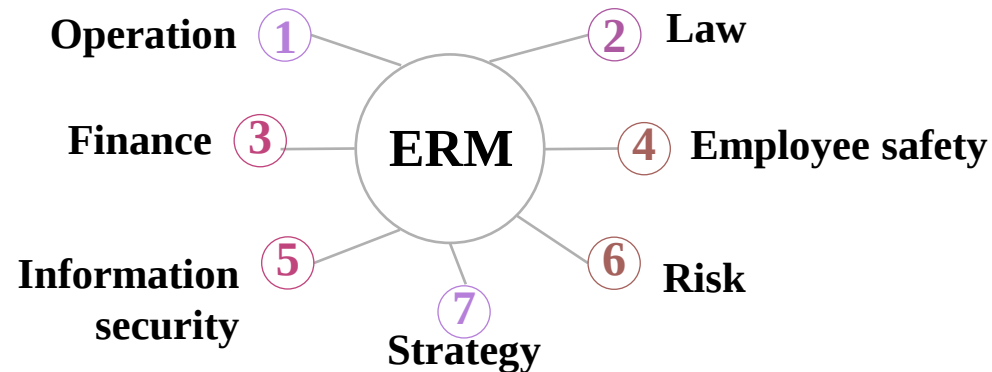
- Relying on the characteristics of industrialization, digitization and globalization of **Cainiao Logistics**, ALPHA can reduce losses and increase efficiency.
- After the goods are produced, they can be sent directly from the factory to the preferred warehouse, which reduces the circulation of packages under the traditional logistics path, and the merchants **do not need to build their own warehouses and operate warehouses.**

Case analysis (3): LEGO



Strategic Risk Management

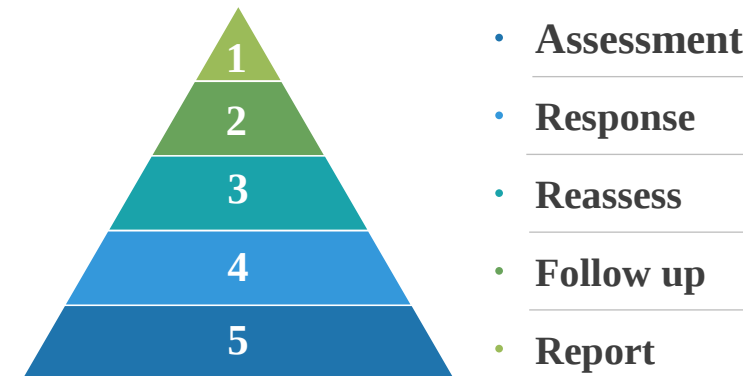
Step1: Total risk management



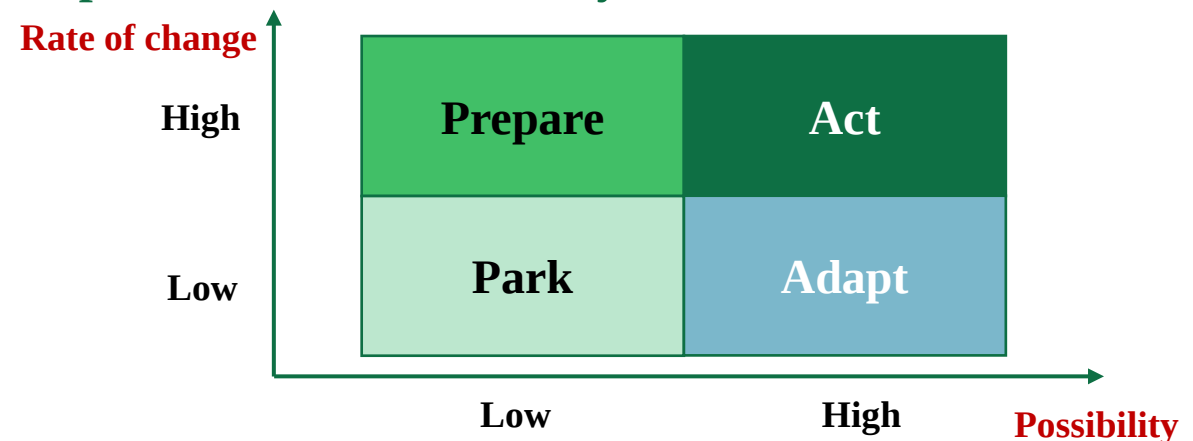
Step2: Monte Carlo simulation

- Budget simulation
- Credit risk portfolio
- Consolidated exposure

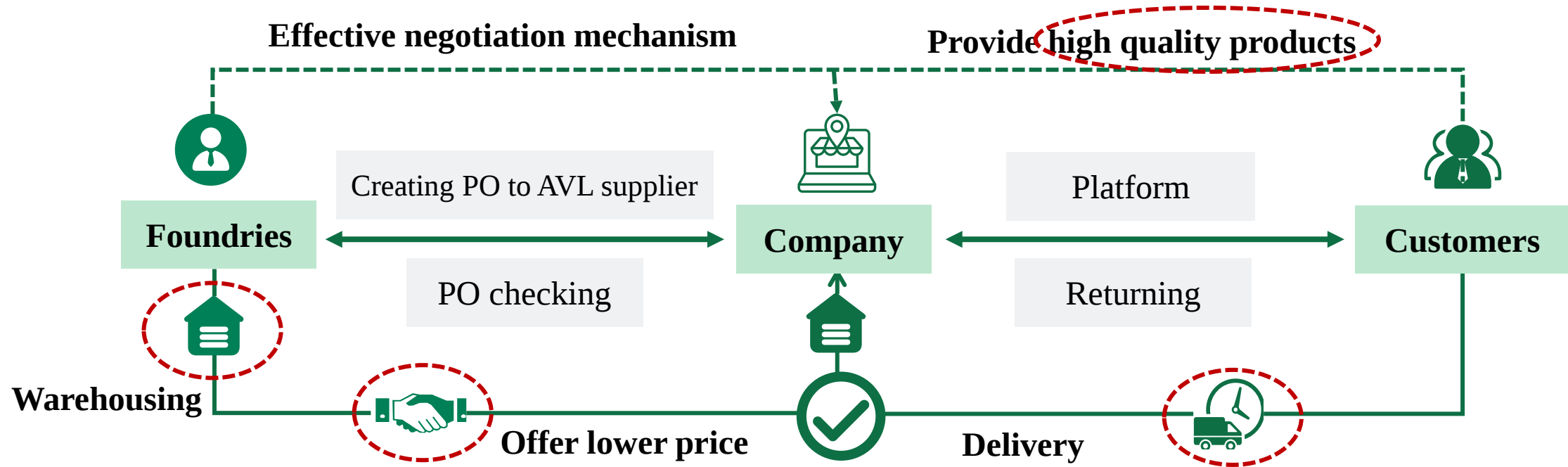
Step3: Positive risk assessment for commercial projects: AROP



Step4: Embrace uncertainty: PAPA

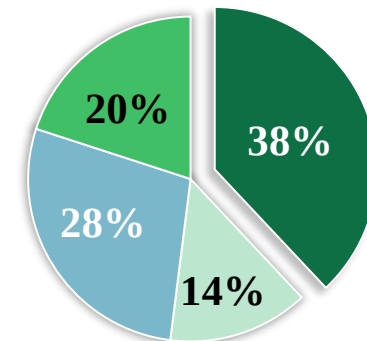


Purchasing and Selling control flow



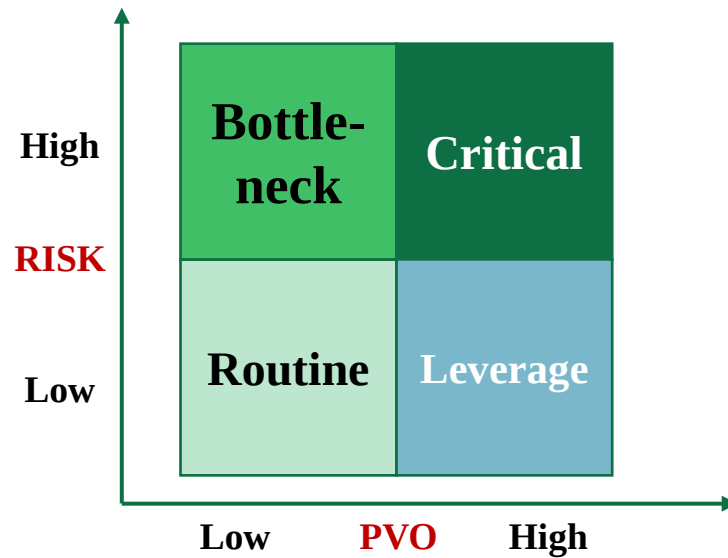
Returns usually occur in the following situations (12 products)

- Return in 7 days without any reason (38%)
- **Quality (28%)**
- Delivery is not timely (20%)
- Courier (14%)

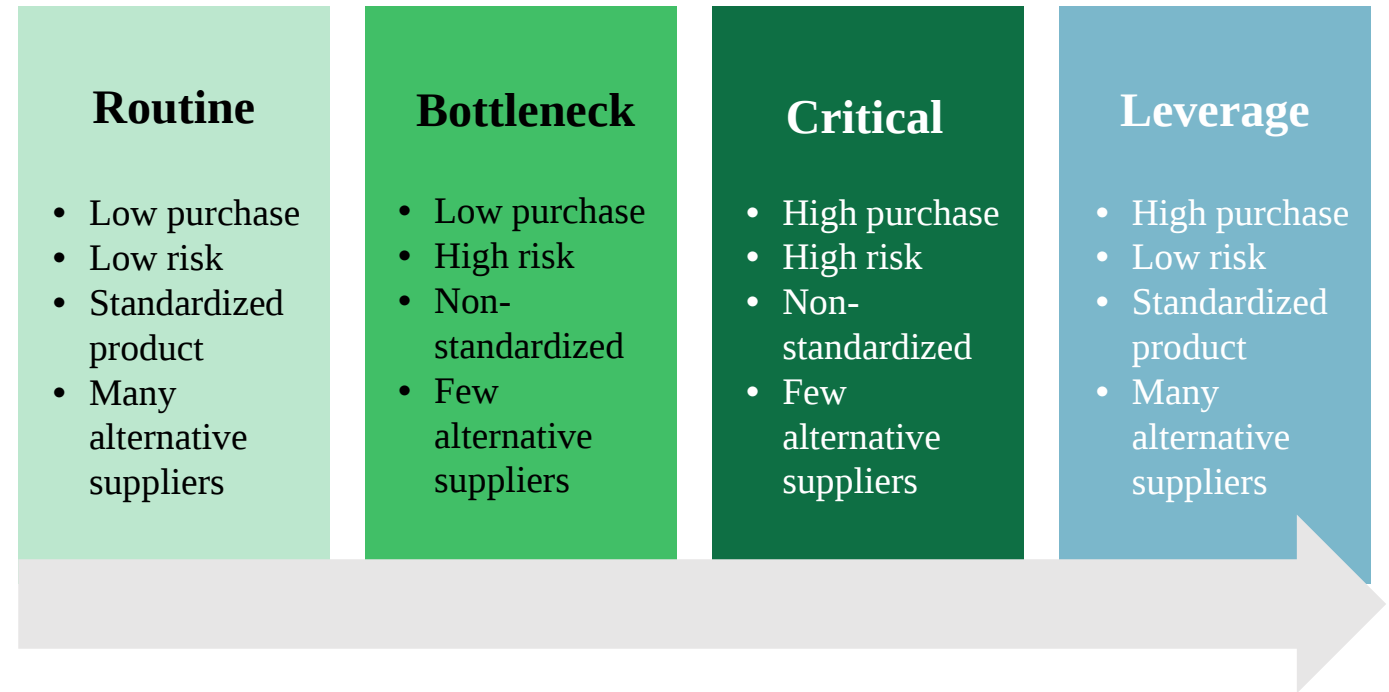


Four-quadrant classification: Item classification

1 Supply Positioning Model



2 Item Classification



Four-quadrant classification: Item classification

3 12 Products Classification

Routine**Bottleneck****Critical****Leverage**

BJ-balance
beam

AH-006 massage ball
BG-006 balance plate
CR005-18 swing
CF001-S slide
DH-007 Three-
dimensional play room

CM-009 software roller
CU-032 Vientiane
Combination Set
DP-007 soft climbing
combination
DK-008 detachable large
slide
ER-003 multifunctional
climbing frame

AH-001 tactile ball

Choose the right supplier

DEVELOP

——Bottleneck Products

- Backup supplier.
- Agree a fixed quantity with the supplier.
- Supply to reduce risk and sign long-term contracts with suppliers.

MARGINAL

——Routine Products

- Requires a preferred supplier.
- A long-term or permanent contract.
- Increasing attractiveness to suppliers.



Supplier Perception Model

CORE

——Critical Products

- Have compatible business strategy with the purchasers.
- Cannot establish similar cooperative relationship with the purchaser's competitors.

EXPLOIT

——Leverage Products

- Ideal suppliers should have cost advantages in the short and medium term.
- Focus on switching cost.



Thanks!

