

IMA Case Report



Better & Smarter

Suggestions on sales forecasting, inventory management
& manufacture outsource

**JADE PASS
CONSULTING**



- 
- 1 Sales Forecasting**
 - 2 Inventory Management**
 - 3 Manufacture Outsource**

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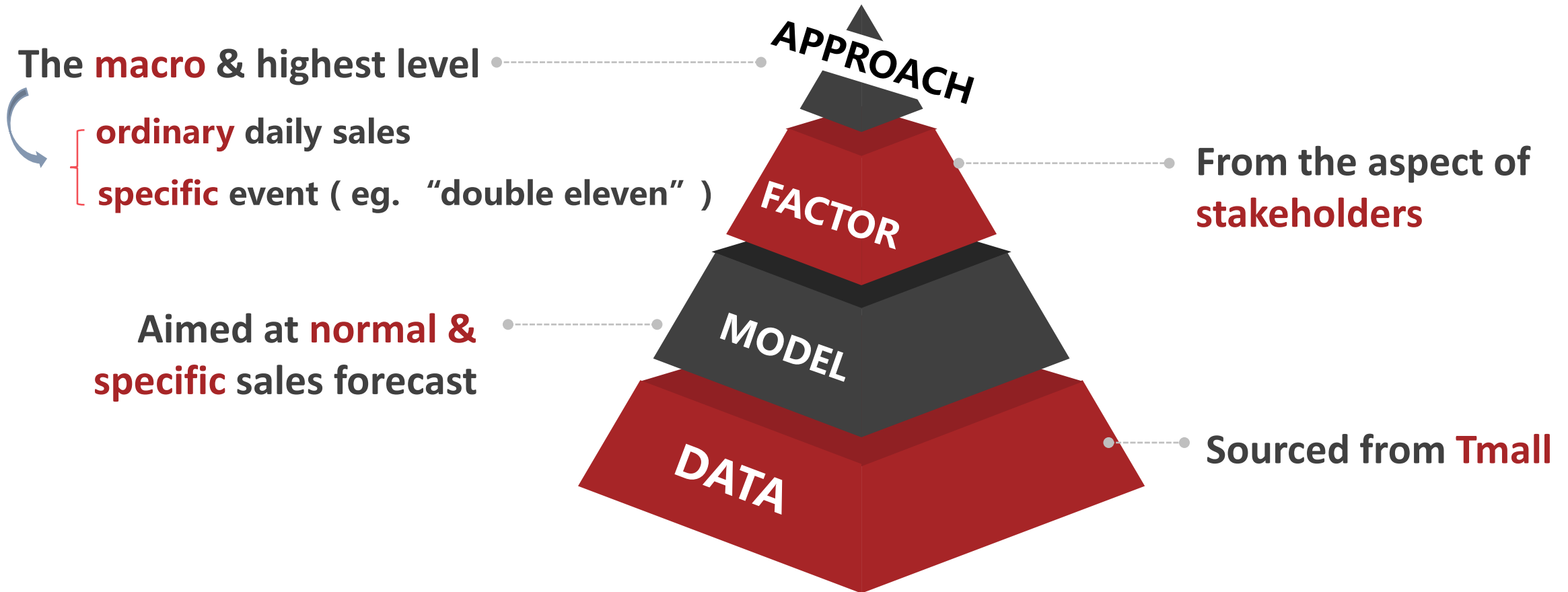


SALES FORECASTING

01

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- Overview



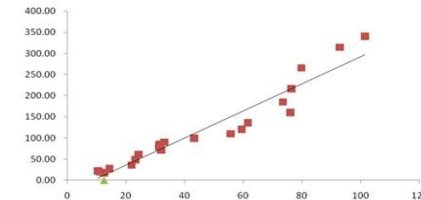
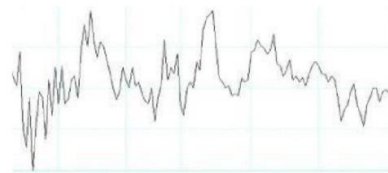
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- Methods of forecasting

01

Ordinary sales

- Normal approaches will be sufficient, such as time series analysis, regression, trend forecast, grey prediction, etc.



02

Specific sales
(core problem)

- Trend forecast & regression may be **useless**
→ more specialized approaches such as hotspot analysis, analysis of intention to purchase & attention-degree for promotions

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- Factors considered

Internal stakeholders

- **FS itself**: such as its objectives (focus on quality & differentiation)

External stakeholders

- **Policy**: second-child & third-child policy




Connected stakeholders

- **Customers**: expectations & needs (most important)
- **Competitors**: price of rivalries will affect the sale of FS
- **E-commerce platforms**: means of support to sales
- **Suppliers**: not important

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- Modeling: Jensen Measure

$$q_t = \sum_{i=1}^n a_i \beta_i + \varepsilon_i$$


FACTORS



- Inventory
- Price
- Discount
- Advertisement
- Reputation
- Social trend
- Policy

Use crawler directly

Sentiment analysis

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- Modeling: Jensen Measure

Sentiment analysis:

1. Text extraction
2. Weight assignment
3. Value assignment

Crawler

```
settings.py
1 # -*- coding: utf-8 -*-
2
3 BOT_NAME = 'weibo'
4 SPIDER_MODULES = ['weibo.spiders']
5 NEWSPIDER_MODULE = 'weibo.spiders'
6 COOKIES_ENABLED = False
7 TELNETCONSOLE_ENABLED = False
8 LOG_LEVEL = 'ERROR'
9 DOWNLOAD_DELAY = 10
10 DEFAULT_REQUEST_HEADERS = {
11     'Accept':
12         'text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8',
13     'Accept-Language': 'zh-CN,zh;q=0.9,en;q=0.8,en-US;q=0.7',
14     'cookie': 'SUBP=0033WrSXqPxfW725Ws9JqgNF55529P909Whn0_mzjn.0xV5JFY6RvI585NHD95QESoBXSX-peK5pWs4DqcJp1--41Knc1K.E1--c1KL21-2f1--W1KLW1KnX1--f1-z71Kys1--41-zp1-1hP'
15 }
16 ITEM_PIPELINES = {
17     'weibo.pipelines.DuplicatesPipeline': 300,
18     'weibo.pipelines.CsvPipeline': 301,
19 }
20 KEYWORD_LIST = 'keyword_list.txt'
21 WEIBO_TYPE = 1
22 CONTAIN_TYPE = 0
23 REGION = ['全部']
24 START_DATE = '2020-12-31'
25 END_DATE = '2021-12-31'
26 FURTHER_THRESHOLD = 46
27 IMAGES_STORE = './'
28 FILES_STORE = './'
```


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- **Modeling: Jensen Measure**

Sentiment analysis:

1. Text extraction
2. **Weight assignment**
3. Value assignment

Random Forest

Historic data



Bagging: random factors formation



Boosting: repetitive machine learning and training



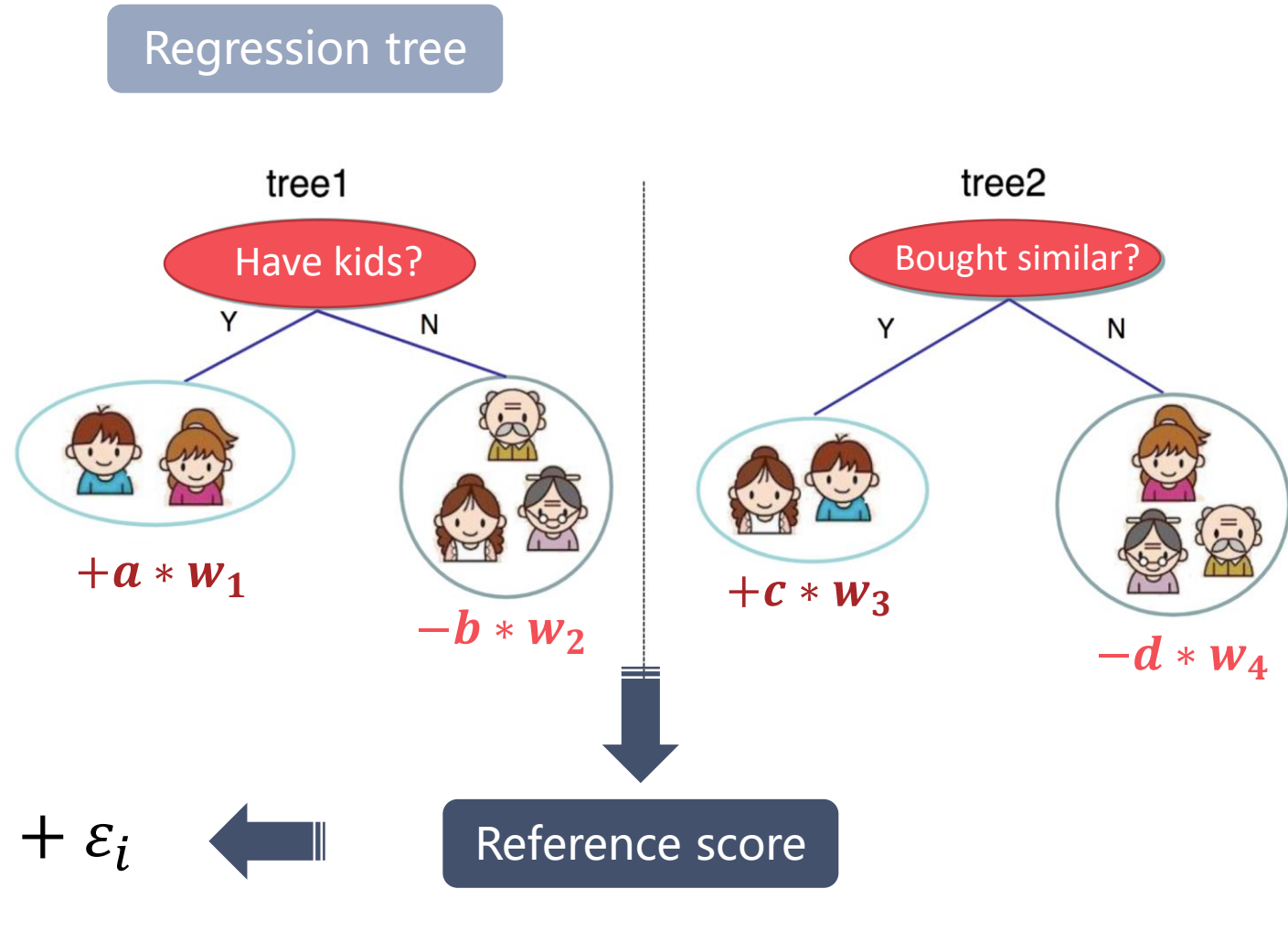
Correct weight: a, b, c, d...

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- Modeling: Jensen's Measure

Sentiment analysis:

- Text extraction
- Weight assignment
- Value assignment

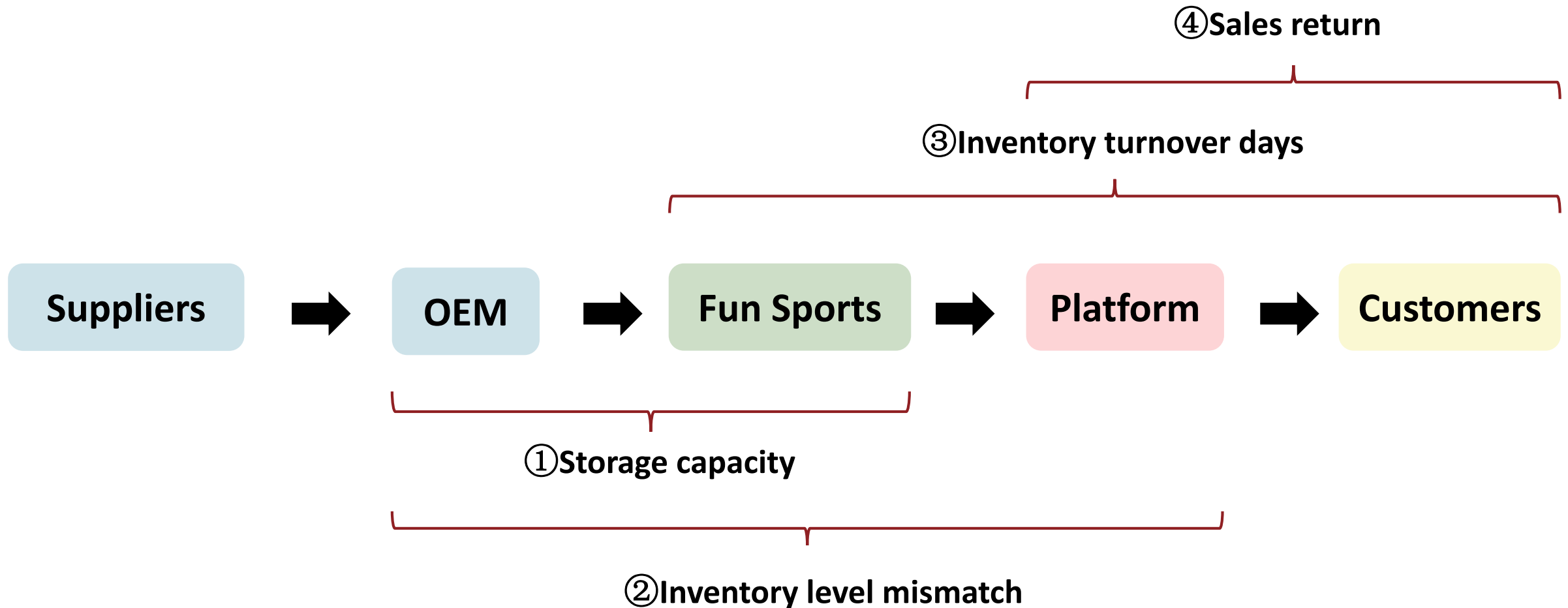


Inventory Storage Management

02

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- Problems



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- **Problems**

①Insufficient storage capacity

- Overmuch storage sites
- Chaotic receive and delivery

④Disordered storage of sales return

- No clear distinction between quality status
- Lack of strict execution in position policy
- No clear and timely entry record

Ambiguity division

+

Non-standard operation

②Inventory level mismatch

Mismatch in account/virtual vs actual:

- Lack of supervision on quality and quantity
- No spot inspection

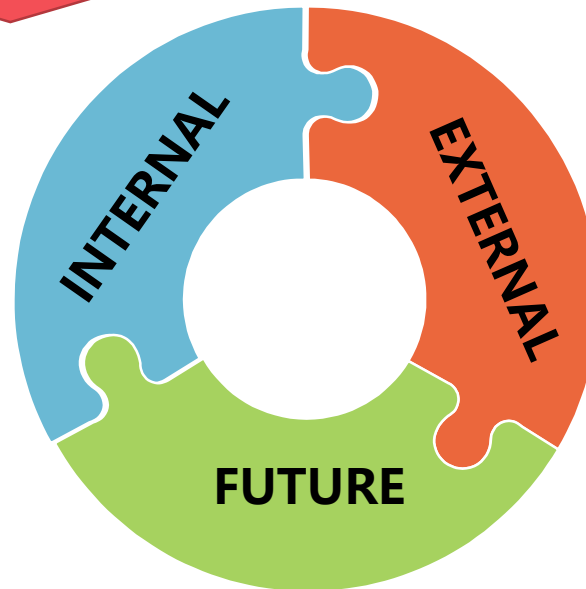
③Improper turnover days

- Absent disposal of unsalable products

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- Negative consequences

- Decrease in revenue
- Higher cost
- Lower profit margin



- Penalty
- Detrimental to goodwill
 - In sale
 - In procurement
- Limits in production capacity and potential markets

- Negatively affect marketing
- Obstruct future development

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- Solutions

- Artificial intelligence
- Block chain
- Internet

Suppliers

OEM

Fun Sports

Platform

Customers

Third party

check and approve

Matrix 1 to n:
Random inspection;
Communication

Regular check
by sampling;
Warning limit

RFID tags

Unsalable items:
as complimentary gift

Warehouse
Department

Outbound

Inbound

Intellectual inventory management

Dispatch

Automation

normal

defects

Sales return

Training →
Supervisor

Sharing cloud database

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• Solutions

Third party approve
quality-check report and GRN

“1 to N”
accountability system:
Matrix structure

Training for warehouse keeper
and additional supervisor;
Keep unabridged and accurate
records of sale and sale return

- Artificial intelligence
- Block chain
- Internet



Sharing cloud database

Ratio frequency identification:
RFID tags, ex, exclusive QR code

Automation of receiving and
delivery of products by AI.

Regular inventory count +
information update timely:
Intellectual
inventory management





Manufacture Outsource Strategy



03

03

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- Short-term

Repaired
products

Output

- **Manufacture:**
 - Quality
 - Flexibility
 - Capacity
 - Supply cycle
- **Inventory management:**
 - Quantity
 - Stacking cycle
- **Price**
- **Condition of defective products** (inspection upon inbound)
- **Status of repairment**
- **Quantity and location** of repaired goods



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附录 3: 12 款产品的退货率和退货原因

Appendix 3: Return rate and reason for 12 products

产品 Products	退货率 Return rate	退货原因占比 Proportion of reasons for return			
		七天无理由退货 Return in 7 days without any reason	发货不及时 Delivery is not timely	品质问题 Quality	快递原因 Courier
AH-001 触觉球 AH-001 tactile ball	10.20%	100.00%			
AH-006 按摩球 AH-006 massage ball	6.82%	30.00%		60.00%	10.00%
BG-006 平衡曲板 BG-006 balance plate	7.51%	90.50%		8.67%	0.83%
BJ-平衡木 BJ-balance beam	5.78%	100.00%			
CM-009 软体滚筒 CM-009 software roller	7.12%	87.73%		12.27%	
CR005-18 秋千 CR005-18 swing	16.07%	80.00%	10.00%	10.00%	
CF001-S 滑梯 CF001-S slide	9.96%	85.85%		14.15%	
CU-032 万象组合套装 CU-032 Vientiane Combination Set	15.00%	60.00%	2.00%	33.00%	5.00%
DP-007 软体攀爬组合 DP-007 soft climbing combination	5.23%	98.38%		1.08%	0.54%
DK-008 拆卸款大滑梯 DK-008 detachable large slide	5.93%	92.73%	3.50%	3.77%	
DH-007 立体游乐房 DH-007 Three-dimensional play room	6.70%	95.20%		4.80%	
ER-003 多功能攀爬架 ER-003 multifunctional climbing frame	10.70%	48.26%	45.00%	6.74%	

Long-term strategy:

A mixture of...

In-depth outsourcing

For those **Common & Trivial** Products:

Purchase **in bulk** to acquire **economies of scale**.

Customized outsourcing

For those **unique** and **not cost effective** to produce in-house.

- Long-term contracts
- Strategic alliance

Manufacture in-house

For those complicated in nature and whose quality are not currently guaranteed by OEMs.

Eg. Swing & Vientiane Combination Set

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In terms of OEM selection:



Establish **an OEM list** and a **performance evaluation system**



Larger OEM partners



Select regions with **low labor added value** (and such countries if considering international development) .



Long-term strategy:

A **mixture** of...

In-depth outsourcing

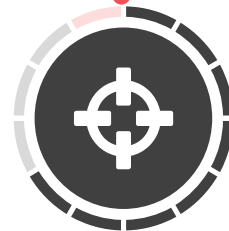
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Thank You!

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