
Why does the Innovator's Dilemma repeatedly happen?

We have researched Disruptive Innovation (DI) cases not only in theory, but also in practice through a variety of consulting interactions.

The most emphatic points in our research of Disruptive Innovation

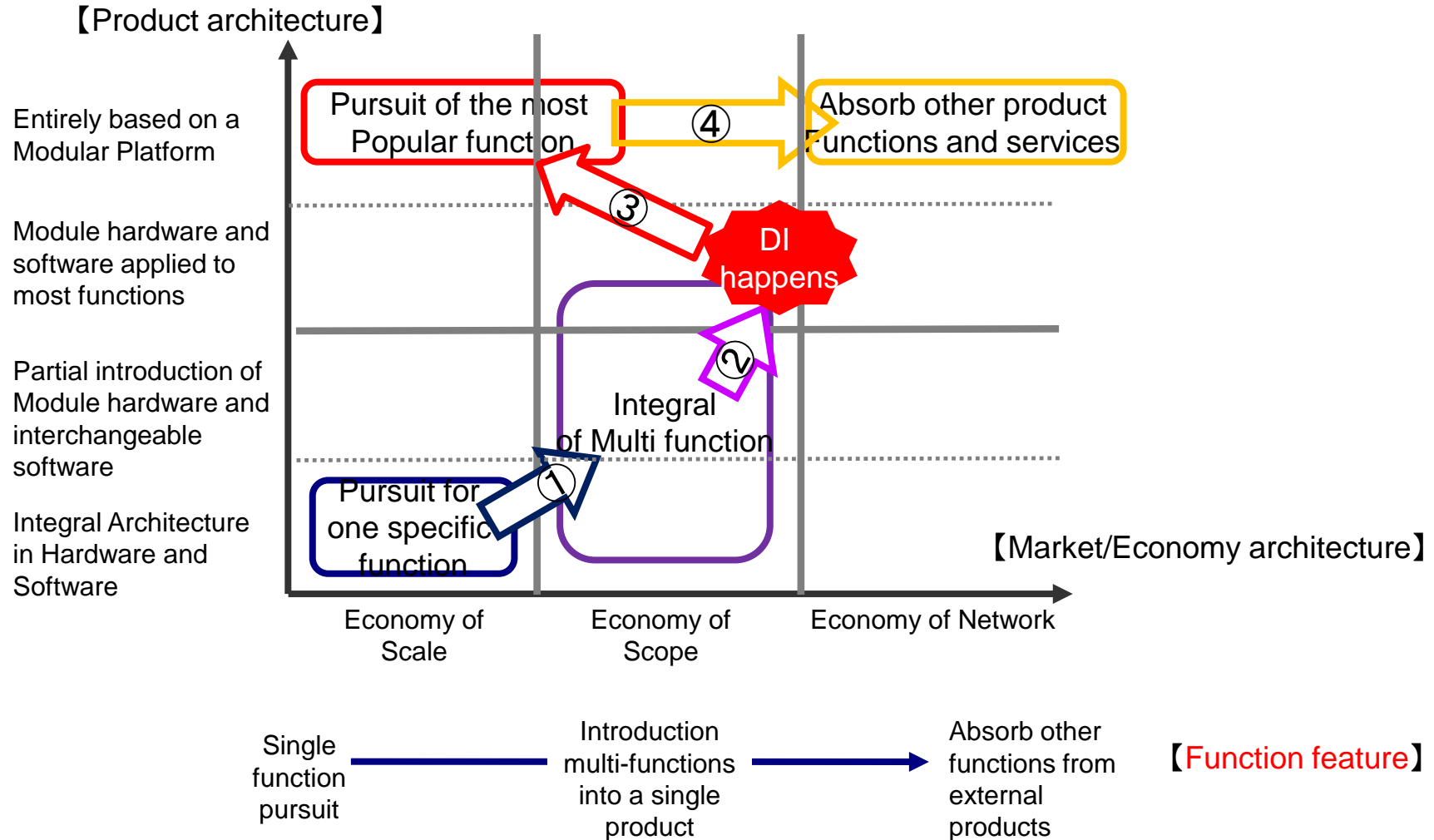
As Prof. Christensen mentioned, too many functions surely cause the Innovator's Dilemma. However most manufactures had already noticed this problem, and therefore developed inexpensive products before Disruptive Innovation (DI) happened.

Then, why couldn't the innovators deal with the DI products?

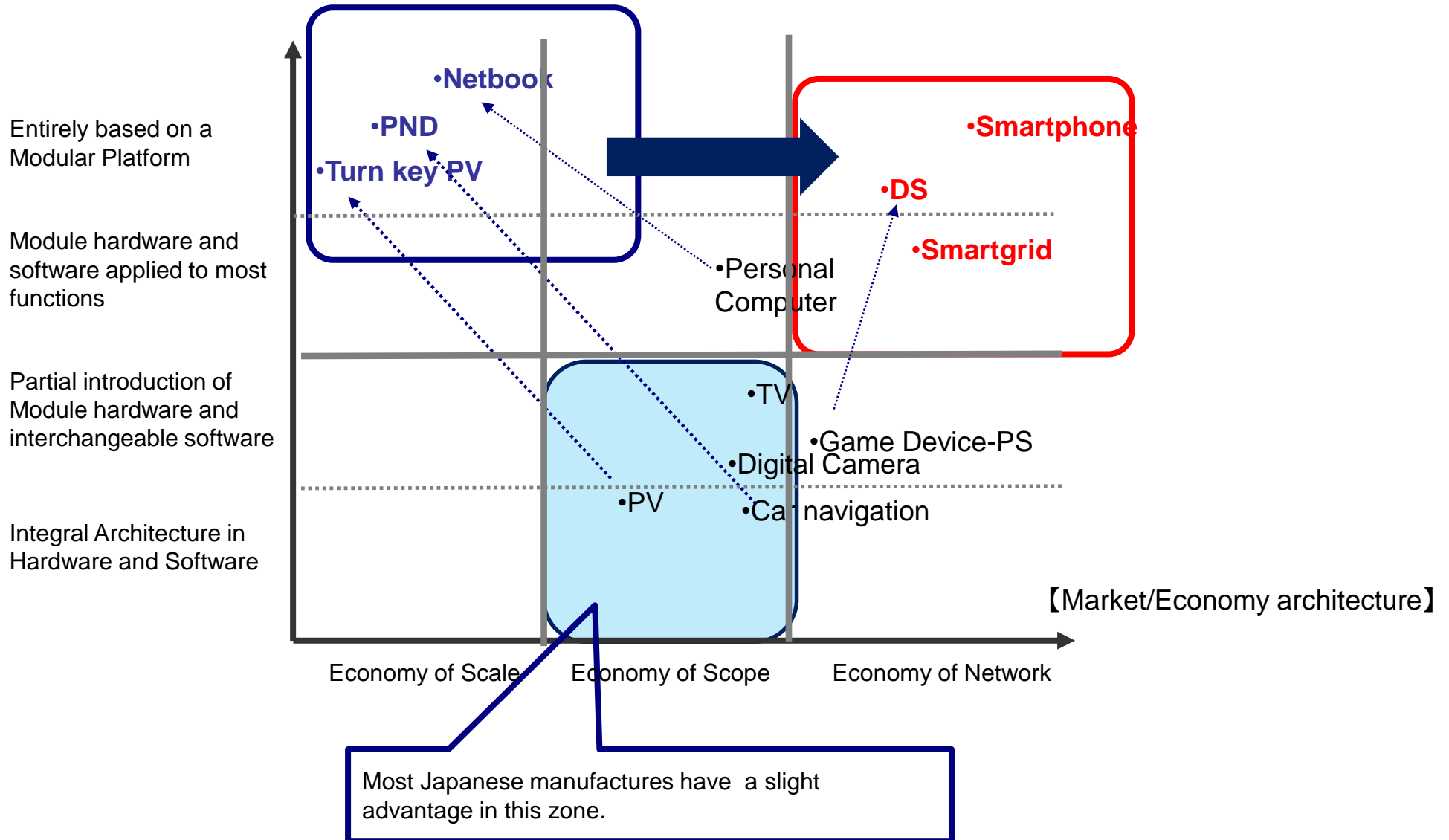
1. Too much variety in the numbers of products would force too high of a cost structure, especially in quality validation, consequential procurement management and sales costs.
2. The most noticeable warning signs before DI happens are;
 - Sales amount per product has continually decreased. (but the change is slight)
 - Development cost divided by the Sales amount (D/S) per product has continually increased . (but the change is slight)
 - However the sales price stays at almost the same level for years.
3. Too many user segments would result in a shrinking market. Once a manufacturer succeeds in a new segment discovery, the other companies usually keep up in no time by incorporating a slightly difference function.

Product and Market Architecture

«Product Architecture × Market Architecture»



Product and Market Architecture



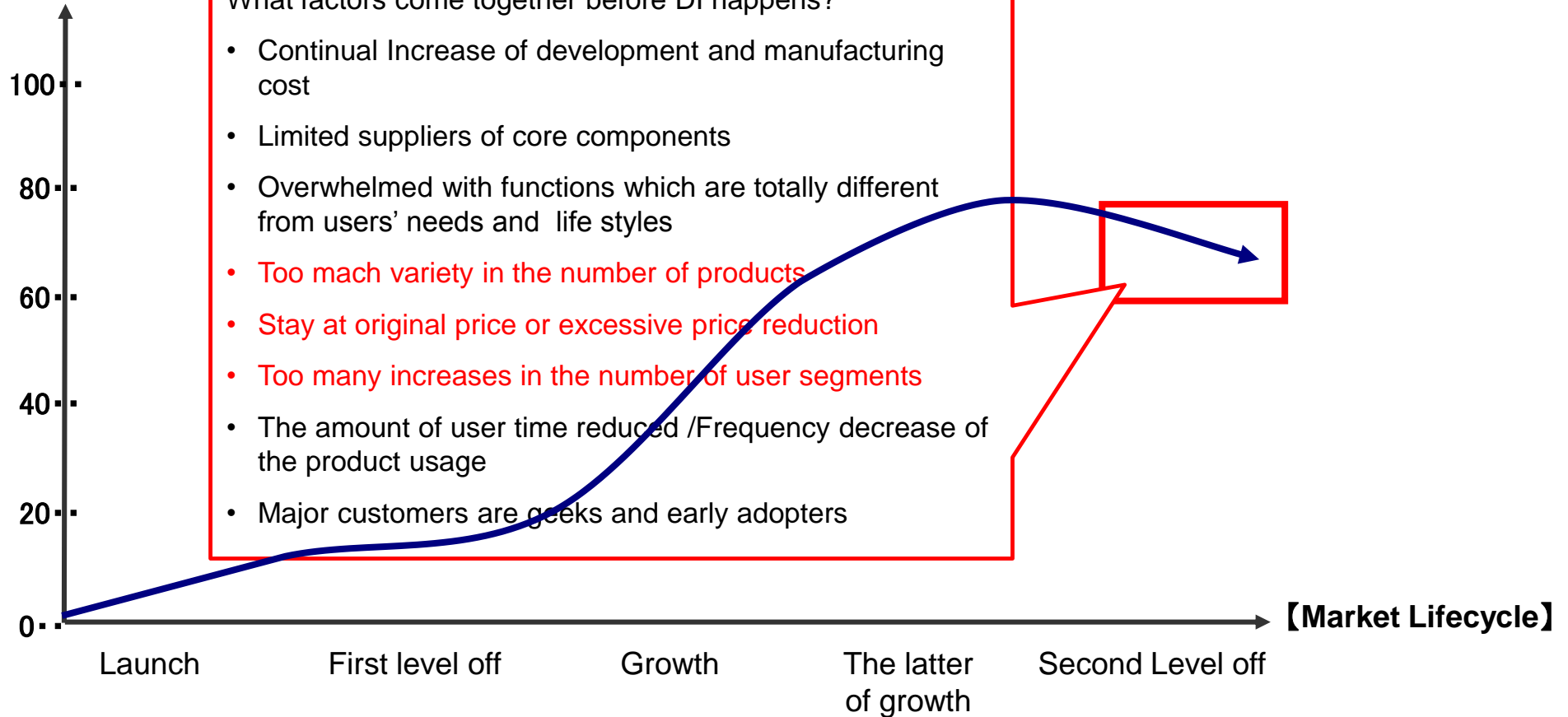
Similarities in recent Disruptive Innovation

Common factors in recent DI cases include: too much variety in the numbers of products (and of course too many functions); the core components shift to lower functions; and the complementary market starts to change.

| | Previous Market Status | Previous Product Status | Previous DI product appealing points |
|-------------------|--|---|---|
| Game Device | <ul style="list-style-type: none"> ● Too many functions ● Soaring development costs for game software ● In game's complementary market, new category and contents like "Physical play & Health & Sports" was pioneered | <ul style="list-style-type: none"> ● Difficult to use the game device and software ● Not to play at ease ● Popular game software based on continuing the existing games | <p>【DS, Wii】</p> <ul style="list-style-type: none"> ● Fresh user interface such as two screen, touch pen ● Connection the game device with the complementary content |
| Car Navigation | <ul style="list-style-type: none"> ● Too many functions and too wide range of the number of products ● Continuous increase in development costs ● The core components shift from high advanced types to common functions types at a lower price | <ul style="list-style-type: none"> ● The amount of user time reduced , but the price almost stayed at the original level ● Difficult to use it ● PDA products started to include the map and navigation functions. | <p>【PND】</p> <ul style="list-style-type: none"> ● Concentration on the navigation function by removal of he others' functions already in PDA ● The DI product price was one – third of existing high advanced car navigation |
| Personal Computer | <ul style="list-style-type: none"> ● Too many functions and too much variety in the number of products ■ The Core components shift from high advanced types to common functions types at lower price ■ New concept trial for "Nonconsumer" (\$100 PC for Bottom of Pyramid) | <ul style="list-style-type: none"> ● The amount of user time reduced , but the price almost stayed at the original level ● Almost all of the usage is just for web browsing | <p>【Netbook】</p> <ul style="list-style-type: none"> ● The DI product price was one – third of high advanced PC ● Concentration on connection to the Web browser was the most popular usage in PC ● The DI product was composed of the pre-generation OS and CPU, and utilizing the new trial |

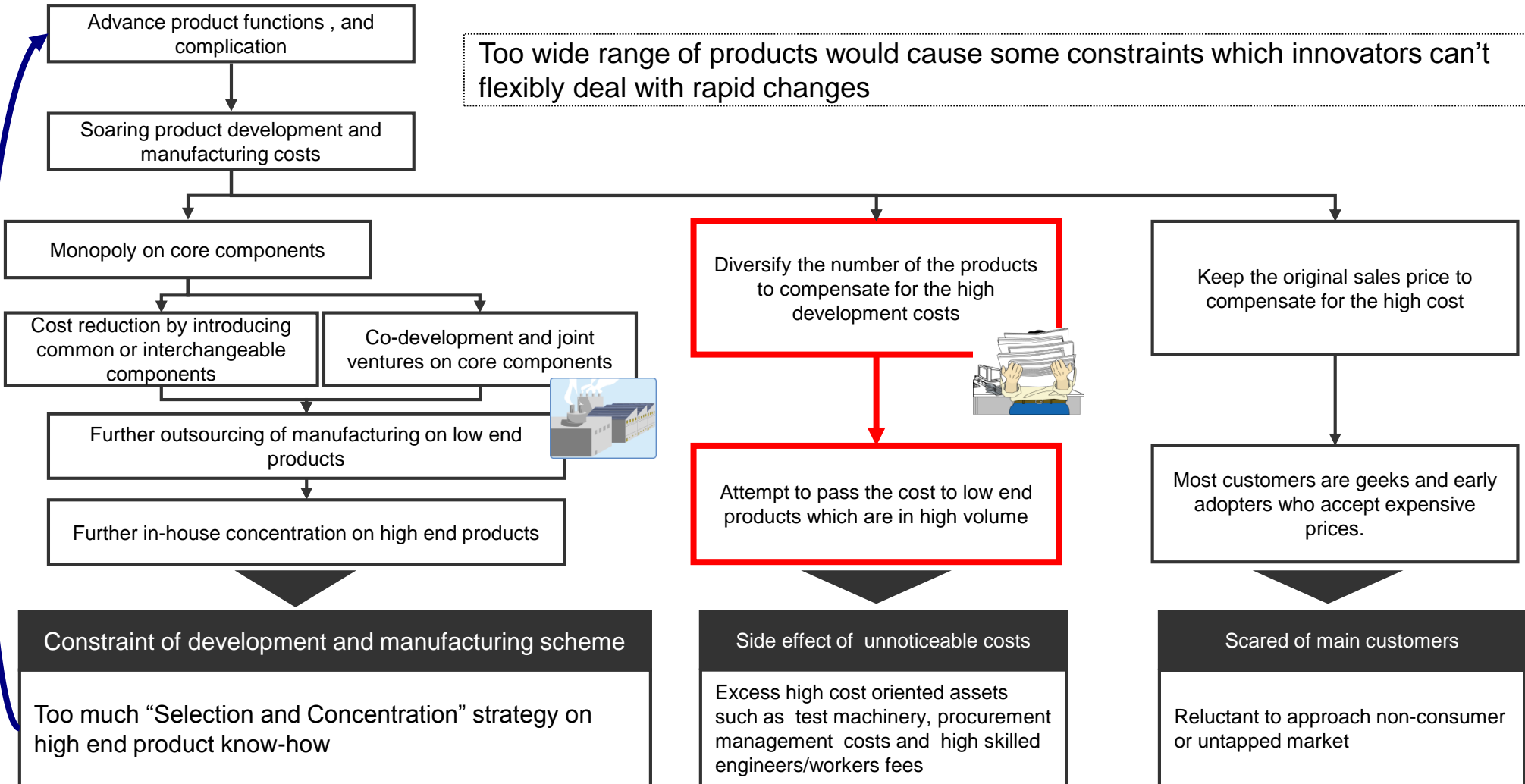
What factors come together before DI happens

【Sales amount】



If the above factors come together, DI would happen by an external company soon. However a lack of the above factors may not create the occurrence of DI.

The cycle Innovators follow prior to DI happening

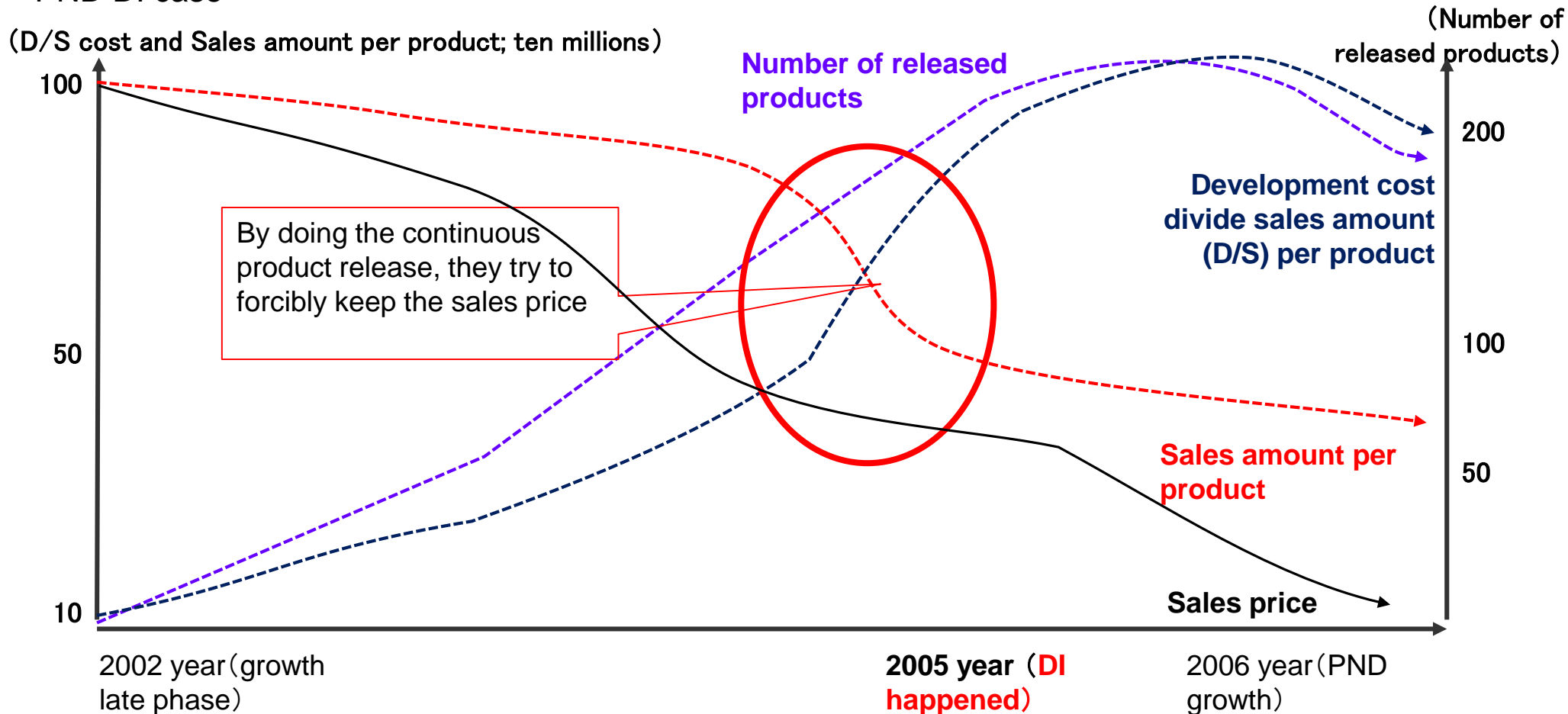


If the concentrated core competence in a manufacturer were changed to the weakness by DI product, besides R&D division focused on the core technology, it would be so quite difficult for the company to survive.

Decrease sales amount per product and Increase development cost per one

- In general, high advanced products market is small scale. Therefore most manufactures tend to transfer the so much development and manufacturing cost to other products which are high volume.
- Due to put it that way, the innovators can't come to rein in increasing the Development cost divided by the Sales amount (D/S) per product, release unceasing new products and decrease sales amount per product.
- In other words, a variety of products strategy-economy of scope can't become a countermeasure just to compensate for the high cost, not meet customers' needs.

■ PND DI case



The loss of common production know-how as market lifecycle forward



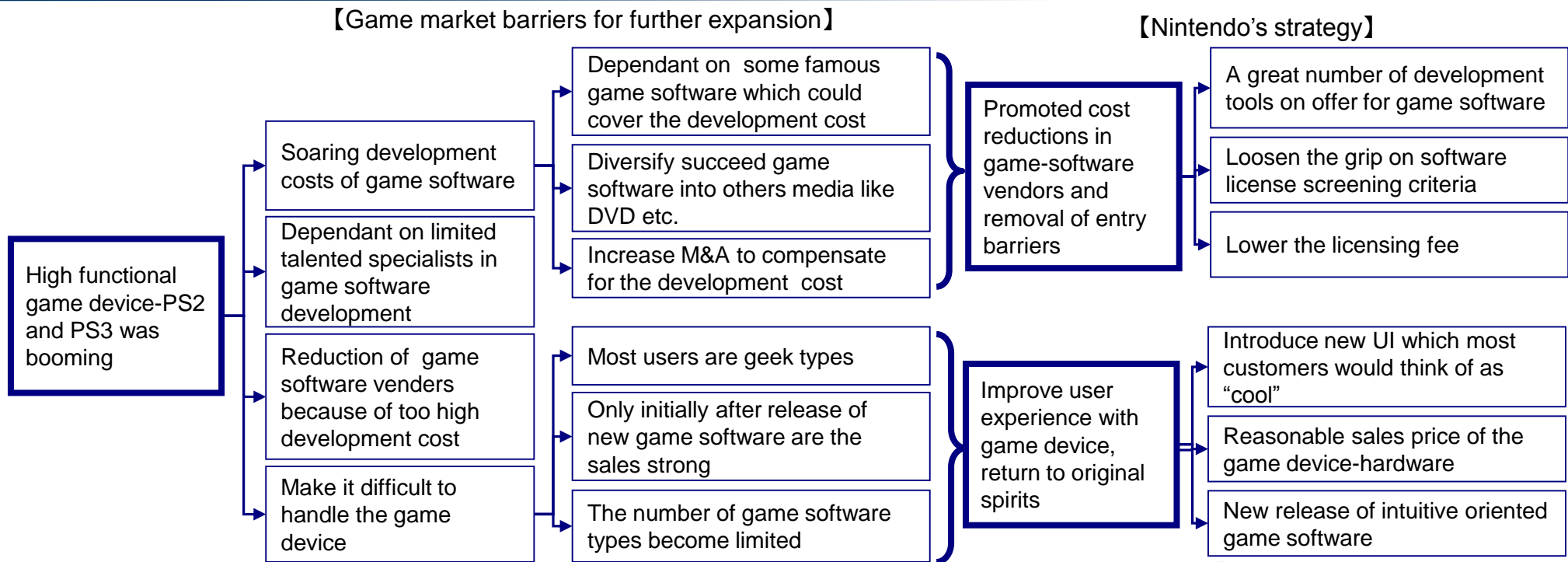
| | | Product Planning | Whole Functions Framework | Basic design on hardware | Detailed design on hardware | Basic Development on software | Detailed development on software | Functions verification | Quality Assurance | manufacturing |
|------------------|-------------------------|------------------|---------------------------|--------------------------|-----------------------------|-------------------------------|----------------------------------|------------------------|-------------------|---------------|
| High End Product | Launch~ First level off | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Growth | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ |
| | In the latter of growth | ◎ | ◎ | ◎ | ○ | ○ | △ | ○ | ◎ | ◎ |
| Low end Product | Launch~ First level off | ◎ | ◎ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | ○ |
| | Growth | ◎ | ◎ | ○ | △ | △ | ▲ | △ | △ | △ |
| | In the latter of growth | ○ | ○ | △ | ▲ | △ | ▲ | △ | △ | ▲ |

◎ Complete in-house production, ○ : Almost in-house production, △ : Mainly outsource management, ▲ : Dependency on outsourcers

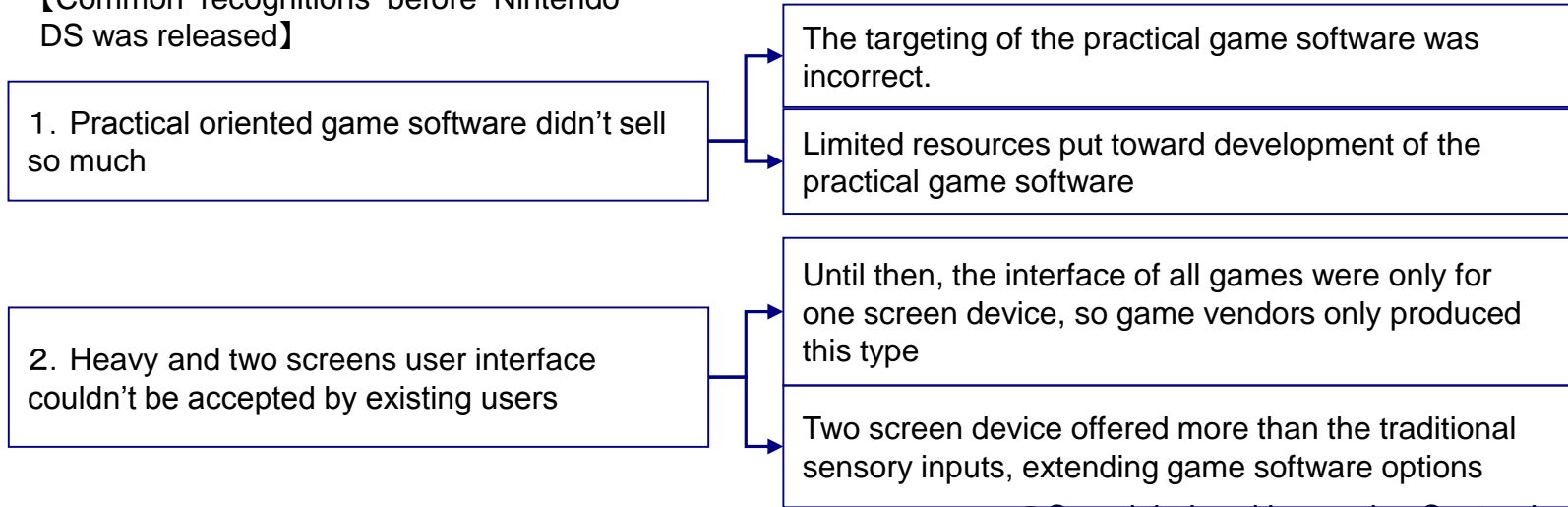
- If DI happens in this phase, since the innovators become lose low end production know-how, they can't develop the similar DI product to compete with it.
- Therefore, during the market growth period, a lot of preparation have to be implemented.

Common Factors in each Innovator's Dilemma case

Prior game market situations and Nintendo's strategy before DS was released



【Common recognitions before Nintendo DS was released】



【Change of the common sense】

Simultaneous changes to absorb external functions and services

New category occurrence in toy market such as Brain type applications and Play & Wealth software

Product adaptation to the above trend

【New product architecture】

- Two screens
- New interface which can make use of a touch panel and a sensing pen
- Lower function in MPU to smoothly play practical and easy oriented game software

Process adaptation to be capable of evaluation for the above applications

【New development organization and process】

- Concurrent development process between hardware div. and software div.
- CEO lead the division to develop with external vendors
- authority reinforcement to final evaluation div. and criteria change to keep up the market trend

Business model adaptation to attract the above vendors

【New Business model】

- A great number of offer development tools for game software
- Grip Loose for software license screening criteria
- Lower the License fee

Make it easy to develop practical and easy game software

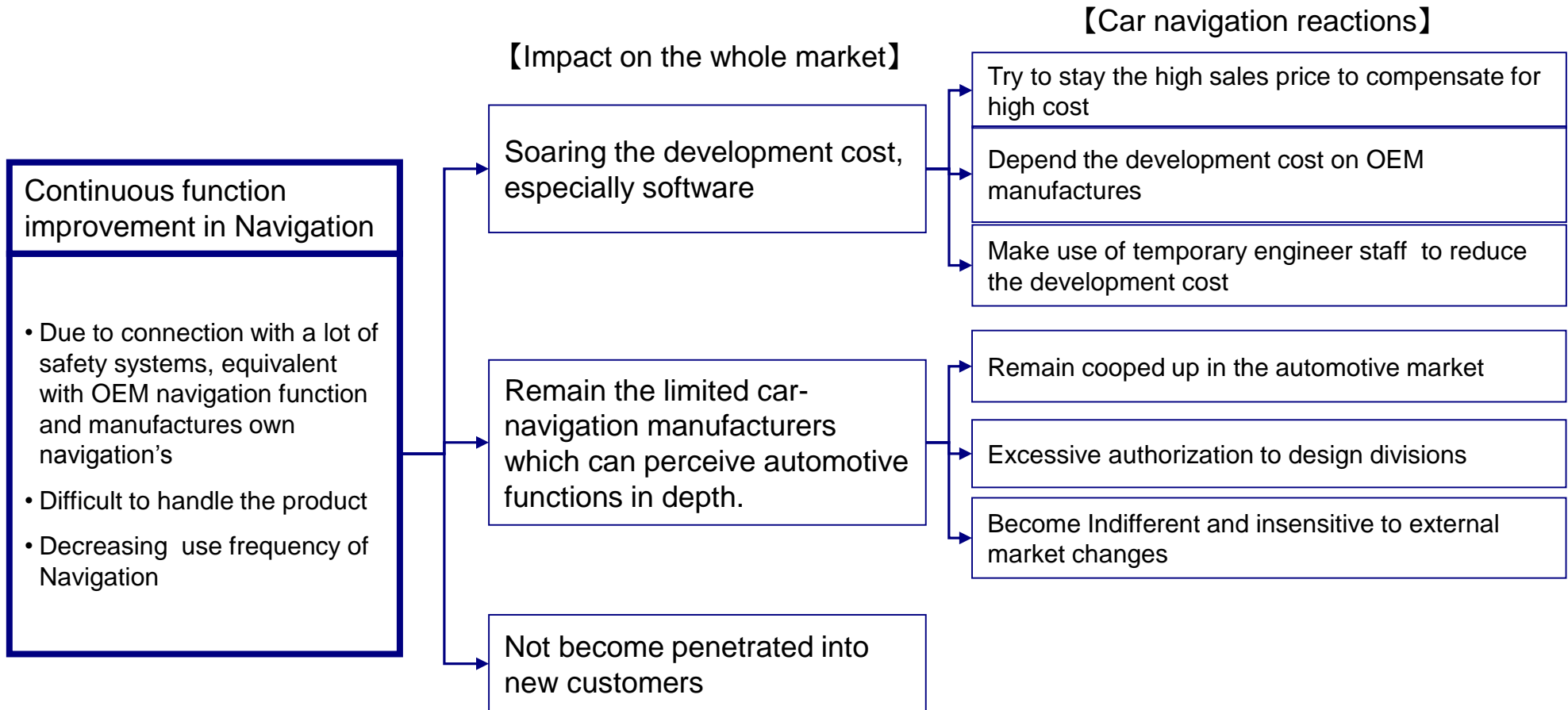
Brain training game software

Animal type game software

English lesson game software

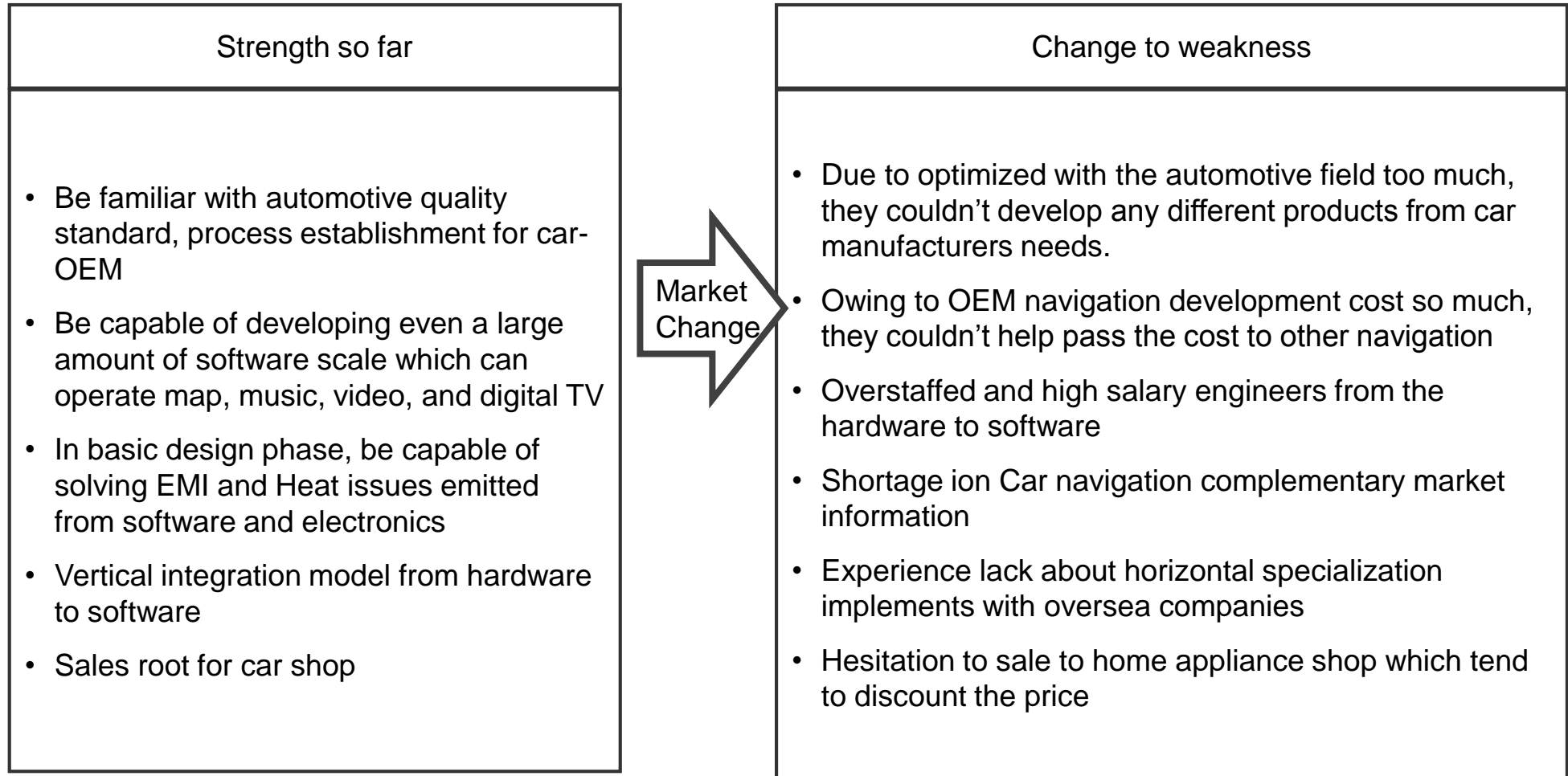
Car navigation innovator's dilemma

The rapid share drop of Japanese car navigation manufacturers is exactly Innovator's dilemma.



The strength converts to the weakness in Car navigation

Japanese car navigation manufacturers have too much acknowledged and cling to automotive field



Innovators features- Vertical integration model vs PND market features

| | Mismatch elements |
|---------------------------------------|--|
| Human Resources | <ul style="list-style-type: none">• Few talented leader who have much experienced a variety of tough negotiations with external companies in accordance with PND-Horizontal specialization |
| Business Processes or Business Models | <ul style="list-style-type: none">• Gap between a development style which a design division has a strong authority and a style which make the most of external technologies from other markets and products• Lack of experience on a great number of procurements know-how from limited suppliers which is required in PND.• Lack of experience for specific function appealing marketing. |
| Technological features | <ul style="list-style-type: none">• Gap between too strict design standard of existing navigation in accordance with a car market, and the design criteria of PND |

High end Navigation features vs PND product features

Function Targets

1. Current position monitor by a lot of sensors: Gap a couple of meters
2. Traffic jam prediction
3. Screen Resolution: VGA (Obligation: Assurance of drive safety)

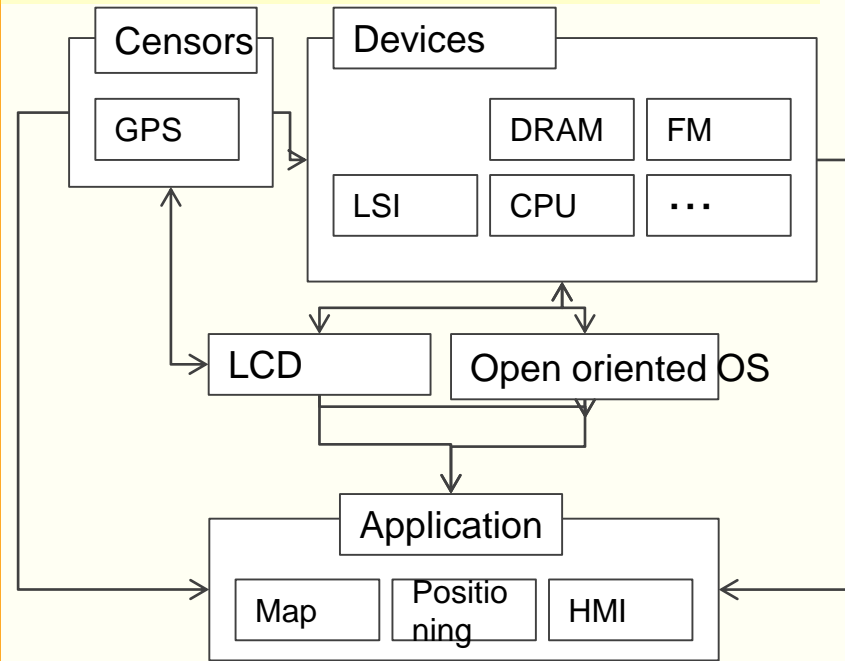
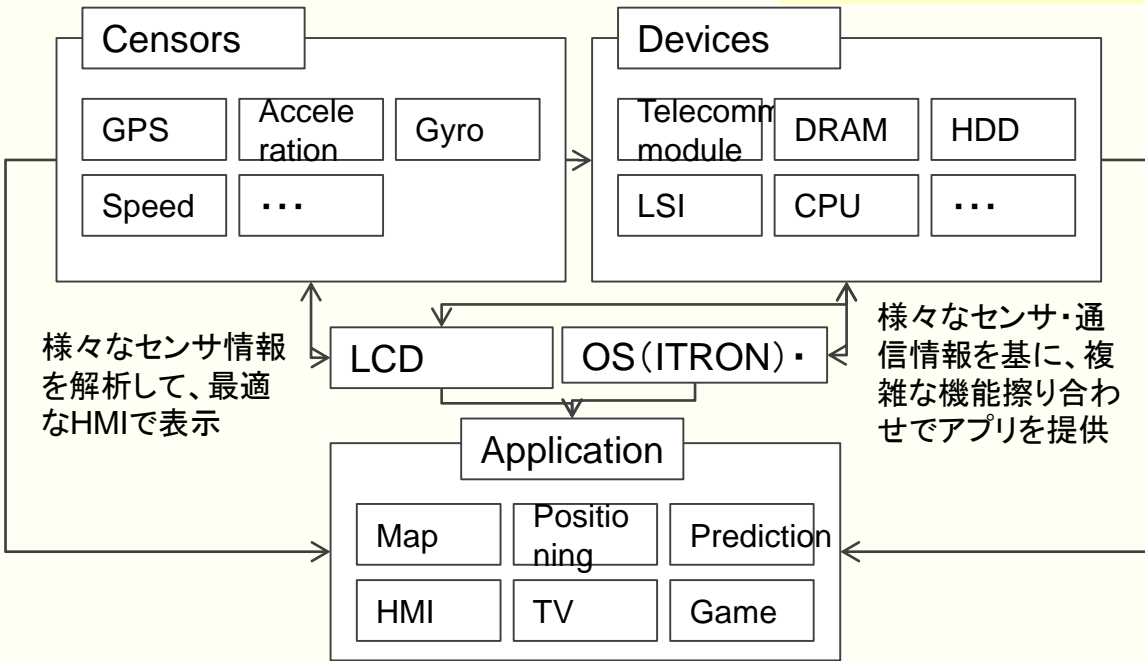
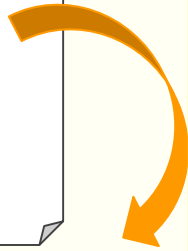
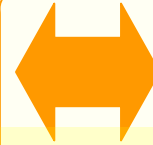
【High end car navigation】

The differences are;

- How current position should be monitored by only GPS precisely?
- How open oriented OS should be used and assure a lot of functions?
- How removal of one component or software have affected to other functions?

A great amount for time and effort s are required to verify the function and quality

【PND】



The strength convert to the weakness in PC

Japanese PC manufacturers put too much resources on specific design and functions.

Strength so far

- Be familiar with cutting edge functions needs from Japanese customers
- Active and passive components mount technology and make it smaller
- Design engineer division has the authority to lead the advanced function to much more progress
- Advanced SCM which can rapidly react the customers' needs changes
- Sales root for big home appliance stores

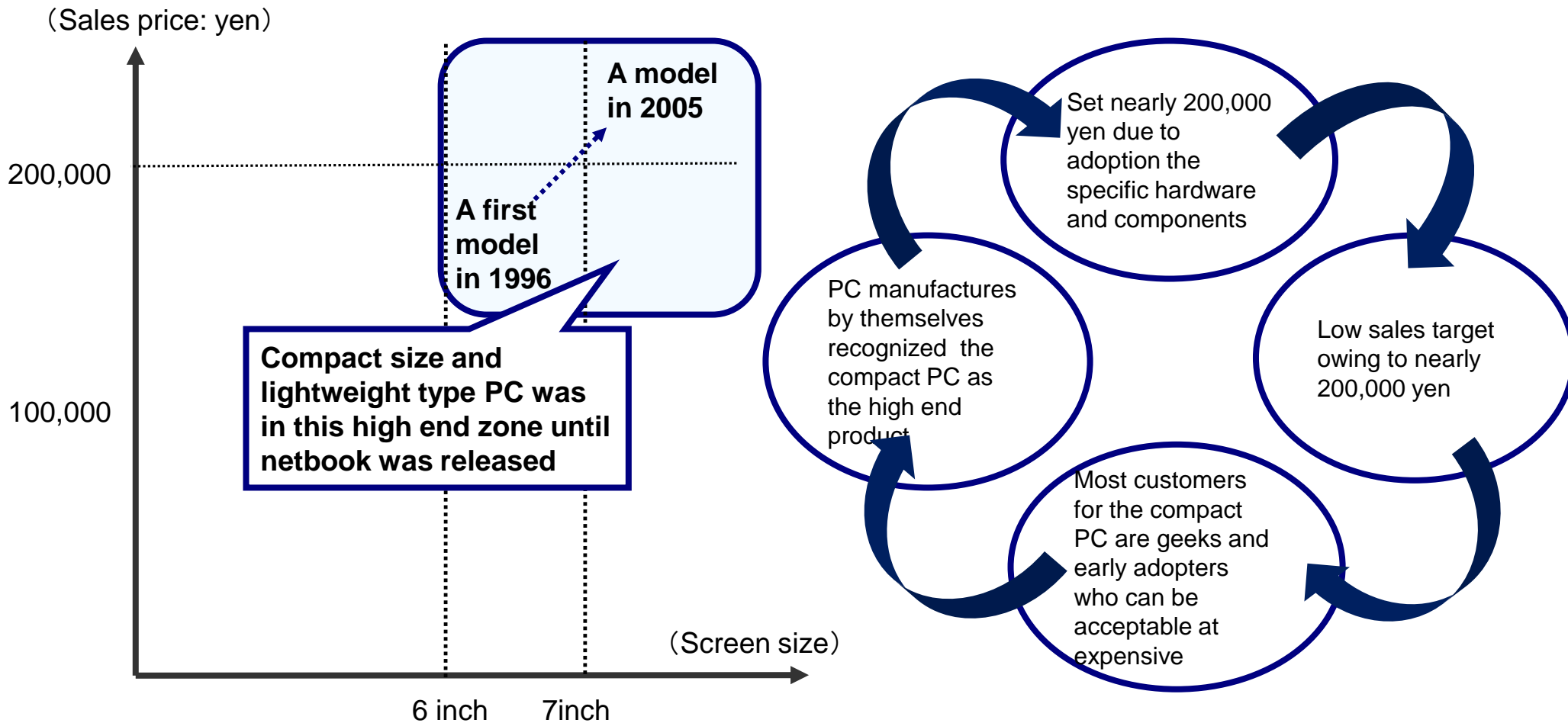
Market
Change

Change to weakness

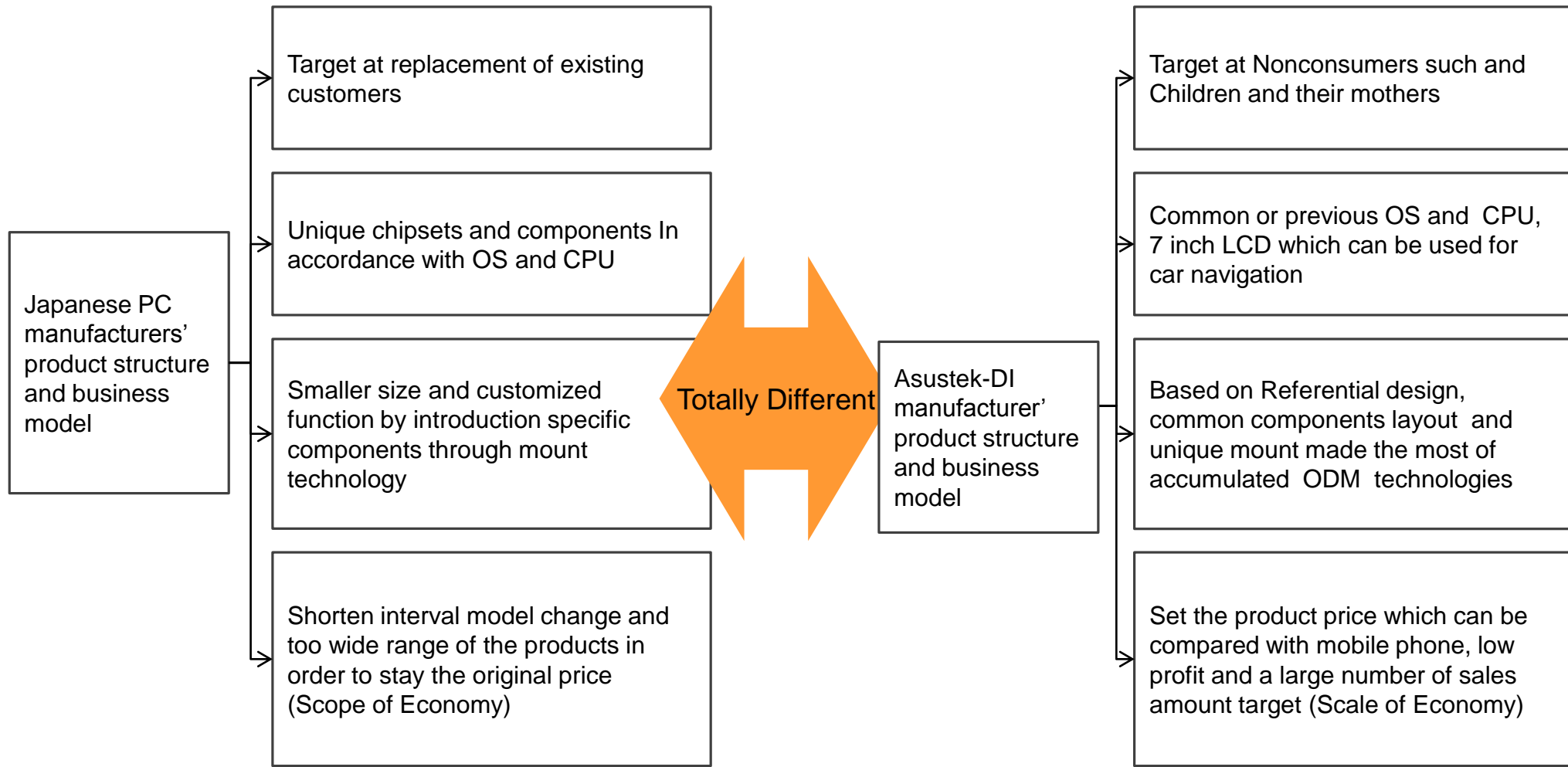
- A lot of engineers tend to put the priority the high function to meet the actual customers needs
- Owing to too specific functions and the system, it was quite difficult to adopt interchangeable components and develop the integrated product with mobile
- Put their resource into the unique functions and needs too much, as a result, spend 30% of the entire cost on the high advanced products which account for 10% of the sales amount
- Too much dependency on the functions that the home appliance stores requested

Compact size and lightweight PC shrink spiral

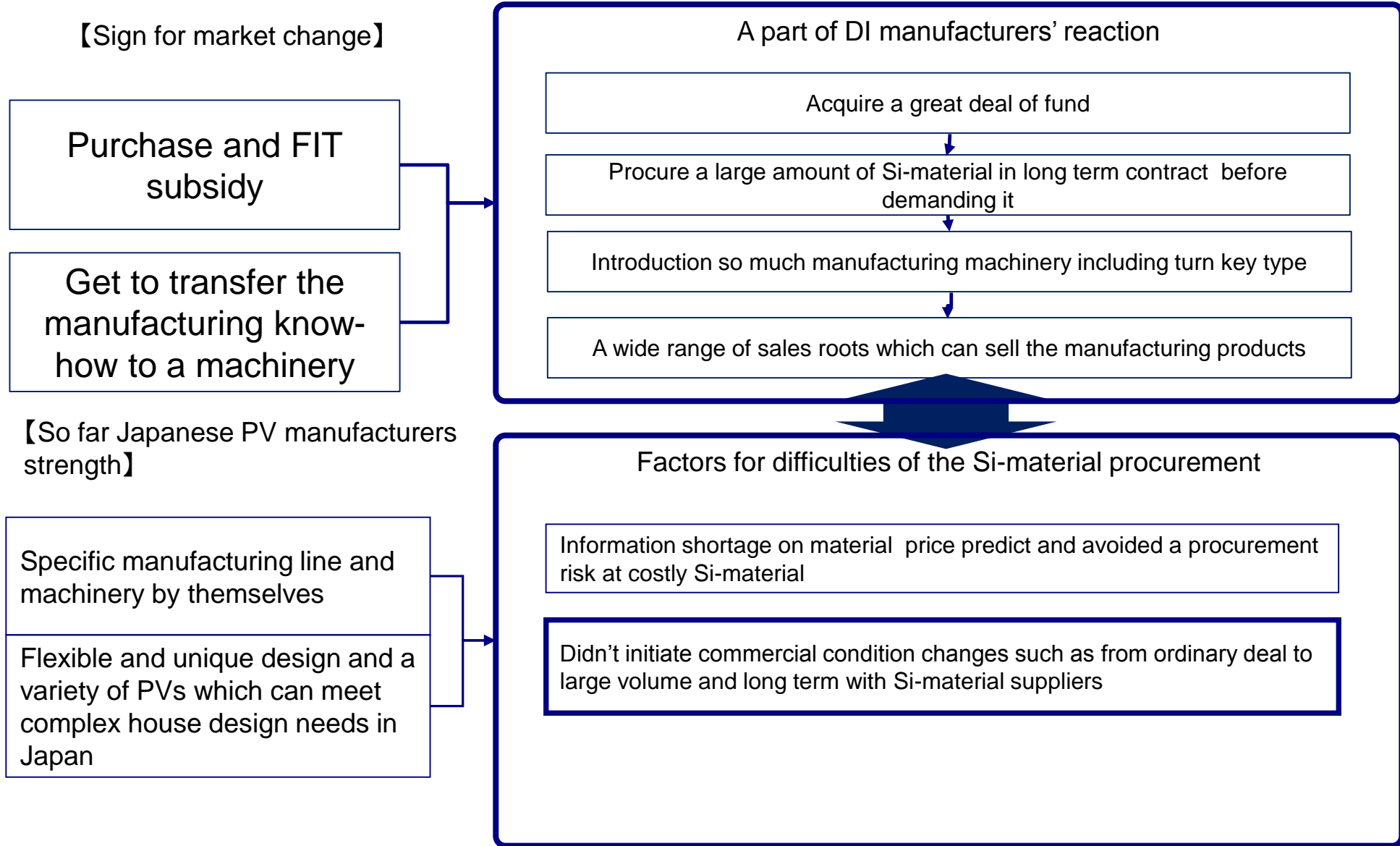
In a compact and lightweight PC similar to netbook, Japanese PC manufacturers position the product as the expensive category by themselves



The difference between Japanese PC innovators and DI manufacturer

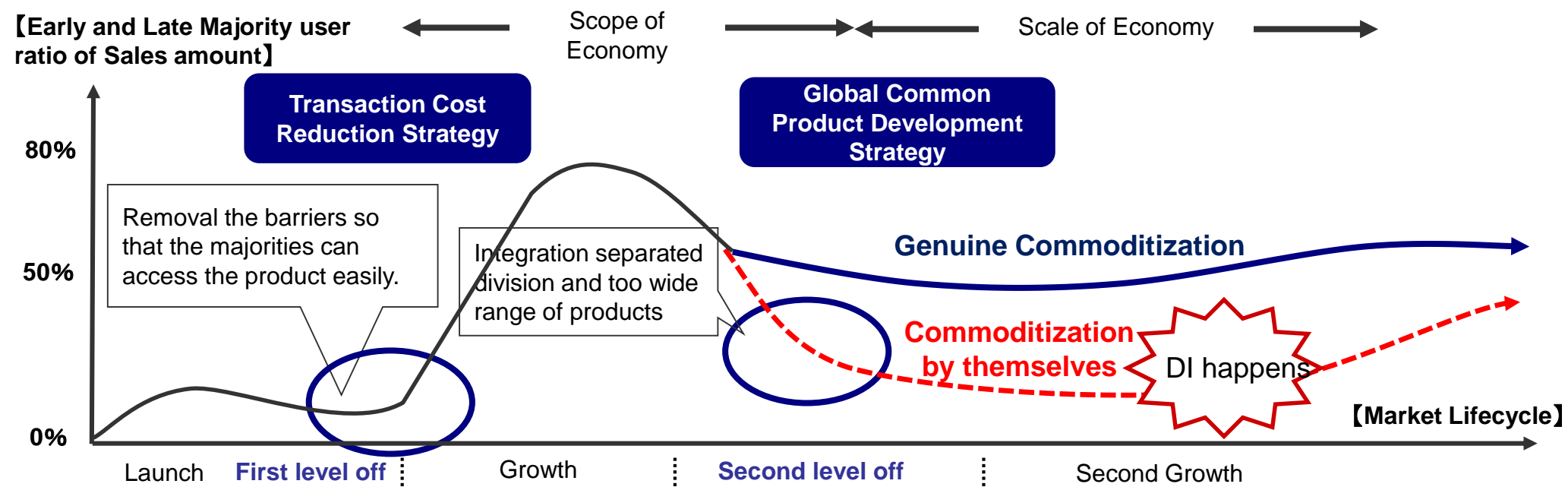


Essential reason for Continuous market share drop



Solutions against the Innovator's Dilemma

Actual reason for Continuous market share drop



| | | | | |
|--------------------------------------|------------------------|---|--|--|
| Which division should lead a company | Planning div. | Design div. and manufacturing technique div. | Procurement div. | Business Development div. |
| Target user | Geek and Early adopter | Early Majority | Late Majority | Nonconsumer and become unused customer |
| Main profitable source | Product | Product | Product and core technology transfer | Multi-profitable source including services, but mainly product |
| Product feature | Specific Function | A variety of products and introduction so many functions to a product | Concentration on the most popular function | Take in other functions from external products or services |

The Balance of Total Optimization and Specific Optimization

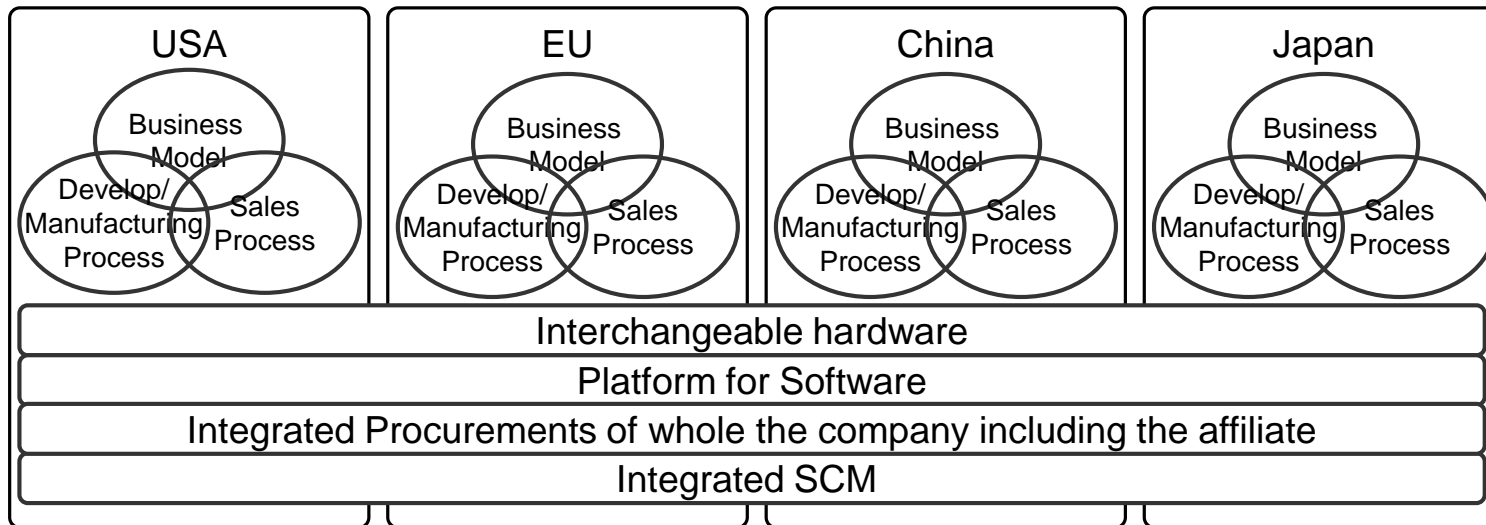
Too specific optimization examples

- Too specific design rules and quality standards
- Too unique functions
- Each procurement from a lot of suppliers
- Too specific manufacturing line process
- Too customized development IT systems, tool and development process

- Scale of economy know-how lost
- Lack of crossover or integrated new products
- Diffusion of the product brand image

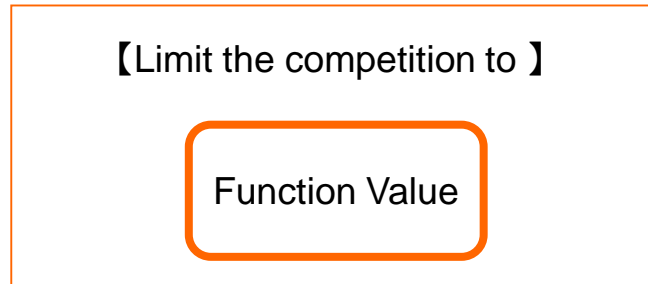


Most manufactures try to introduce the following structures into their companies

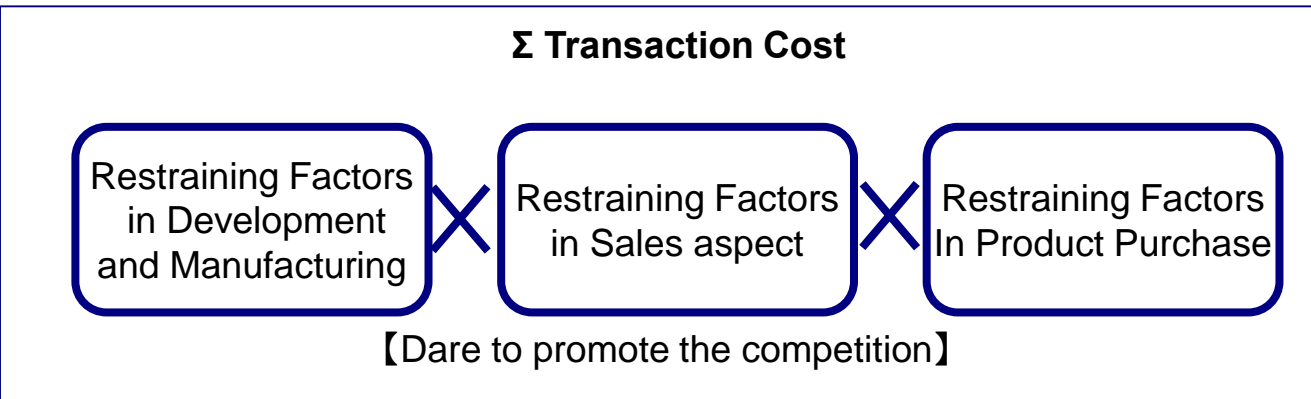
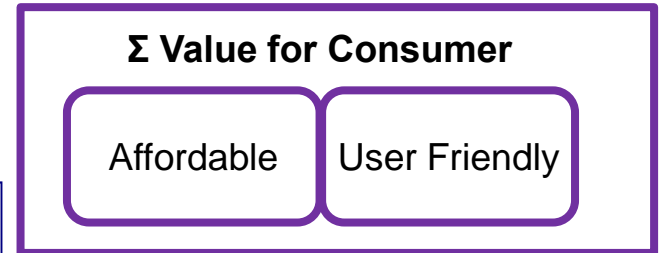


However in reality, there are left a lot of the specific structures, process and product functions.

When Transaction Cost Reduction Strategy should implement in lifecycle?



_____ =



Transaction Cost Reduction Strategy contents



Σ Beyond too specific

Easy to develop

Adoption common design

Standard with others product can

Core technology license offer

Referential design and API disclosure, development tool offer

Easy to manufacture

Adoption of interchangeable components, Modularity

Transfer the manufacturing know-how to a lot of machinery which industrial machinery firms provide

Σ Affordable and User Friendly

Initial cost reduction

Too wide range of the number of the product

Easy to understand the usage merit

Operability anyone can use at ease

Portable size can be used anywhere

High quality and reliability

Synergy with the complementary services

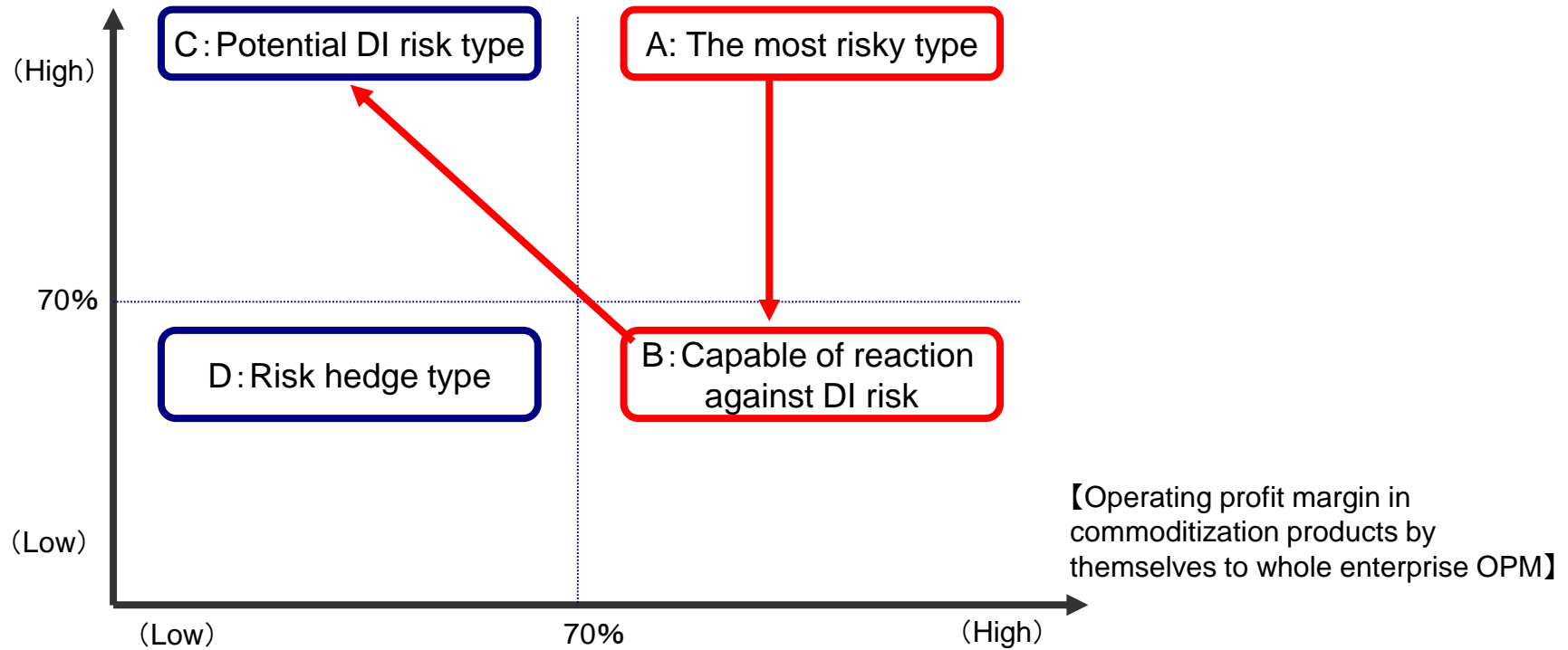
Bandwagon effect with whole society and system



The most important is to implement all of the activities, not to do a couple of trials.

Disruptive Innovation Occurrence Risk Portfolio

【R&D expenditure ratio related to current business division to whole R&D expenditure】



If positioned in “A”, required to change to B, and finally C.

Disruptive Innovation Occurrence Risk Portfolio

【Mainstream R&D scheme by 2007】

Entrust time-consuming activities such as functions verifications and programming on embedded software to oversea R&D division.



【Mainstream R&D scheme since 2008】

Entrust not only the above activities but also development on a part of basic design and detail design software. Besides

And then, “Reverse Innovation” became trend in some innovators.



【Current and future Mainstream R&D scheme- Which division is advantage?】

Not In term of cost reduction and beyond RI, regardless the location of R&D, Internal Competition between oversea R&D div. and domestic R&D div. is required to deal with rapid environmental changes. But the crossover is taken into consideration.