



# Organizational Structure in the Context of International R&D

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Guest Lecture for Masaryk University

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# Agenda

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- Understanding the context of R&D activities conducted by multinational enterprises (MNEs).
- Understanding local market requirements faced by MNEs.
- Understanding the organizational structures of international R&D.
- A case study of the centralization process of international R&D.



# Product Innovation by MNEs





# R&D

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- Research and development (R&D) are composed of two functions.
  - Research: Focusing on knowledge (e.g. scientific knowledge, application knowledge, patents).
  - Development: Focusing on products (i.e. design and engineering).

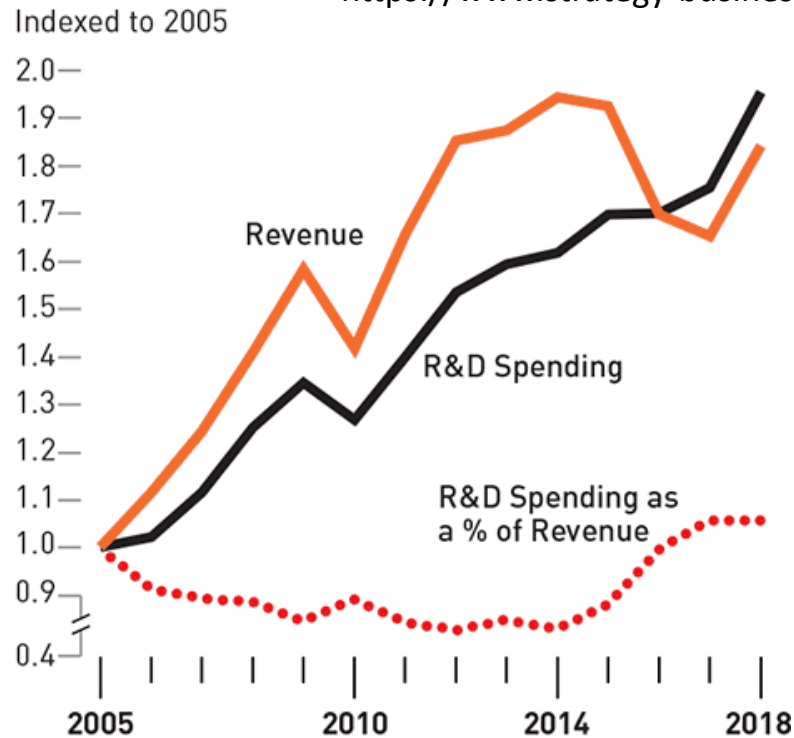
- $$\text{R\&D intensity} = \frac{\text{R\&D spending}}{\text{Sales volume}}$$

# R&D Spending

## R&D and Revenue

In 2018, both revenue and R&D spending among the Global Innovation 1000 continued to climb.

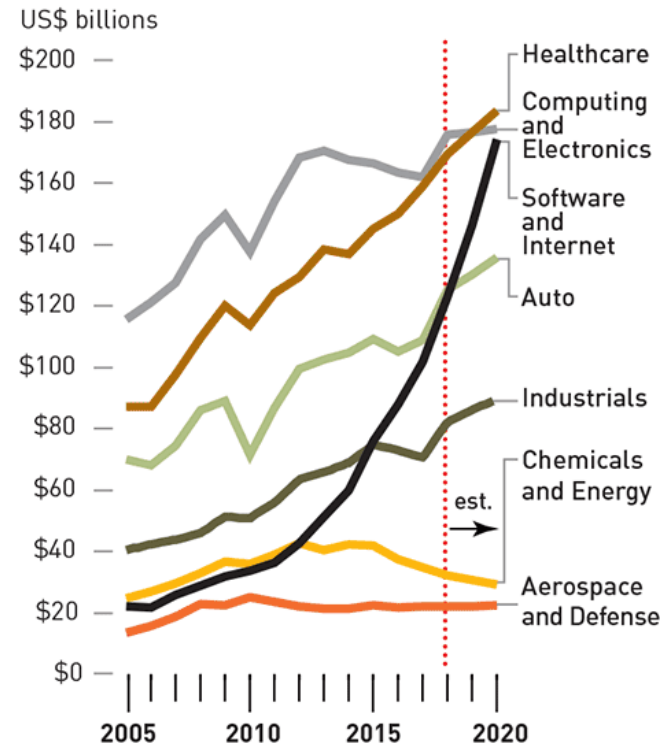
<https://www.strategy-business.com/feature/What-the-Top-Innovators-Get-Right?gko=e7cf9>



**Source:** Capital IQ data, Thomson Reuters Eikon data, Strategy& analysis

## R&D Spending by Industry

Companies in the healthcare and software and Internet sectors demonstrated sustained growth in R&D spending, which has been increasing for years in both cases.



**Source:** Capital IQ data, Thomson Reuters Eikon data, Strategy& analysis



# How Do MNEs Conduct R&D?

- MNEs (in manufacturing industries) have established **global R&D networks** for product innovation.
- An example of Ricoh.



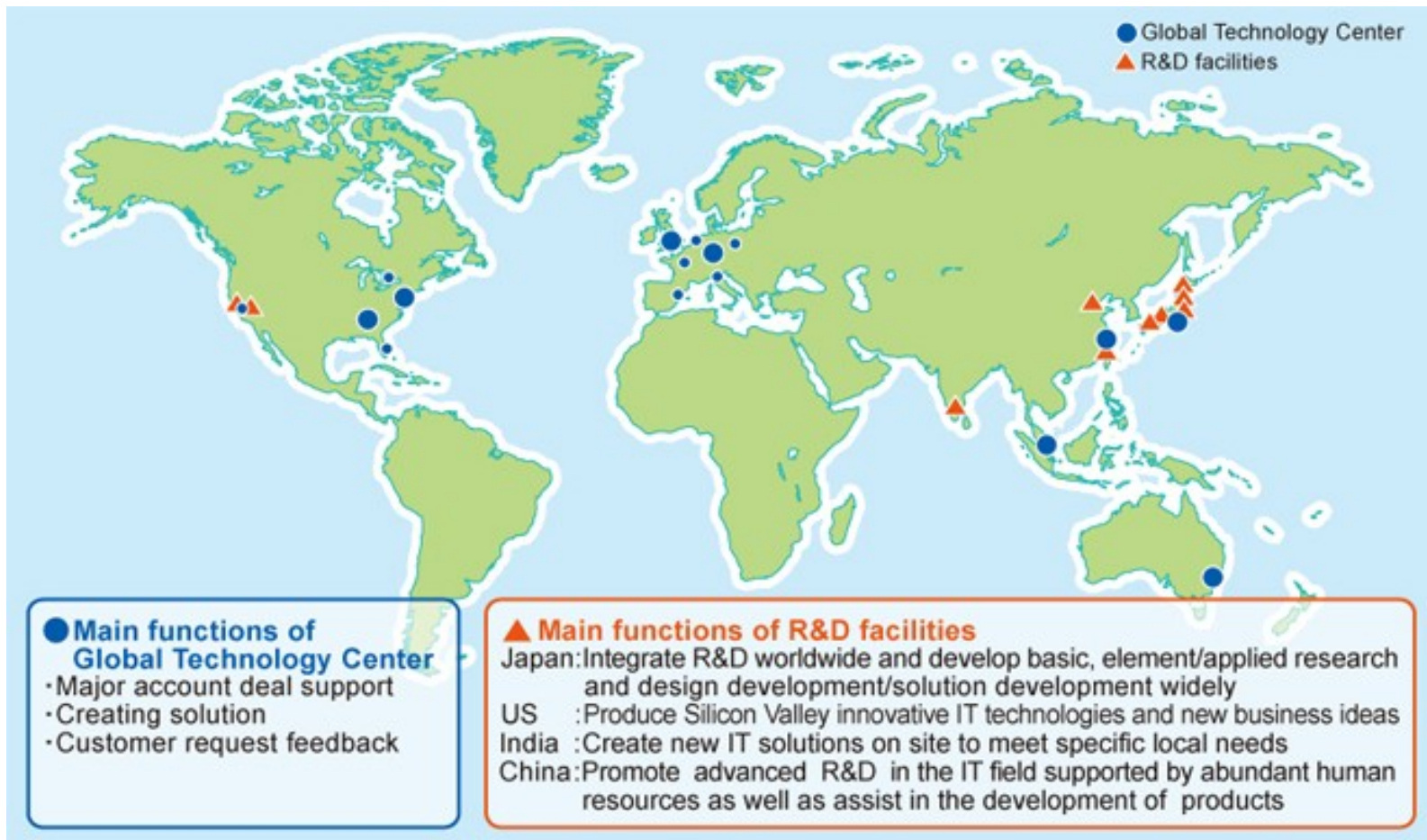
**RICOH**  
imagine. change.



# How Do MNEs Conduct Product Innovation?

- Ricoh Global R&D Network

<https://www.ricoh.com/technology/rd/global.html>





# How Do MNEs Conduct Product Innovation?

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- Ricoh R&D centers are **specialized** – they are centers of excellence. For example:
  - American R&D specializes in photocopiers and fax machines.
  - Indian R&D specializes in software.
  - Japanese R&D specializes in cameras.



# Market Requirements Across Countries

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- When conducting product innovation (i.e. designing new products), firms need to consider market requirements.
- Market requirements can be different across countries, depending on the industry.
- There are different aspects of requirements:
  - Customer taste/habits
  - Local environmental conditions
  - Regulations
  - (Purchasing power)
    - Between developed countries and emerging markets.

# Market Requirements Across Countries

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- Customer tastes/habits (e.g. refrigerator types).
  - In some industries, they are gradually converging, but differences still remain.



Europe



North America



South America



Asia



# Market Requirements Across Countries

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- Local environmental conditions include local weather (e.g. temperature and humidity) and local infrastructure (e.g. road and energy).
  - They are not converging significantly.



Octane Ratings of Petroleum in North America

# Market Requirements Across Countries

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- Regulations/standards are compulsory for firms to meet in a country (e.g. car crashing tests and light configurations).
  - They have greatly converged at the regional level, but not so at the global level.



Side Marker: American vs. European Standards



# Product Standardization-adaptation

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- Global standardization: The product design is similar globally. Low costs due to economies of scale.
- Local adaptation: Products are customized for different requirements locally. More appealing to local customers.

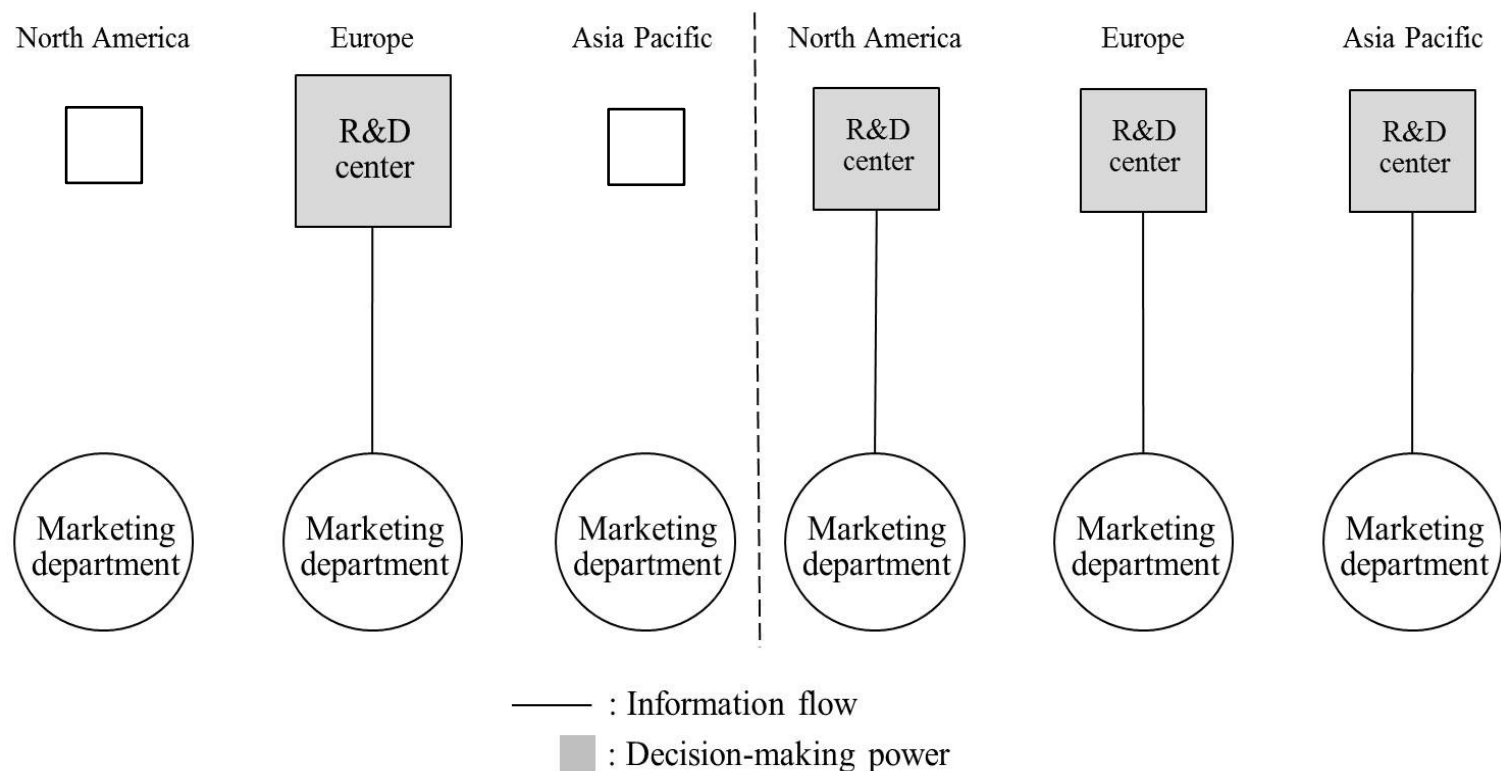
It is a continuum. MNEs make choices somewhere between the two.

High  
standardization

High  
adaptation

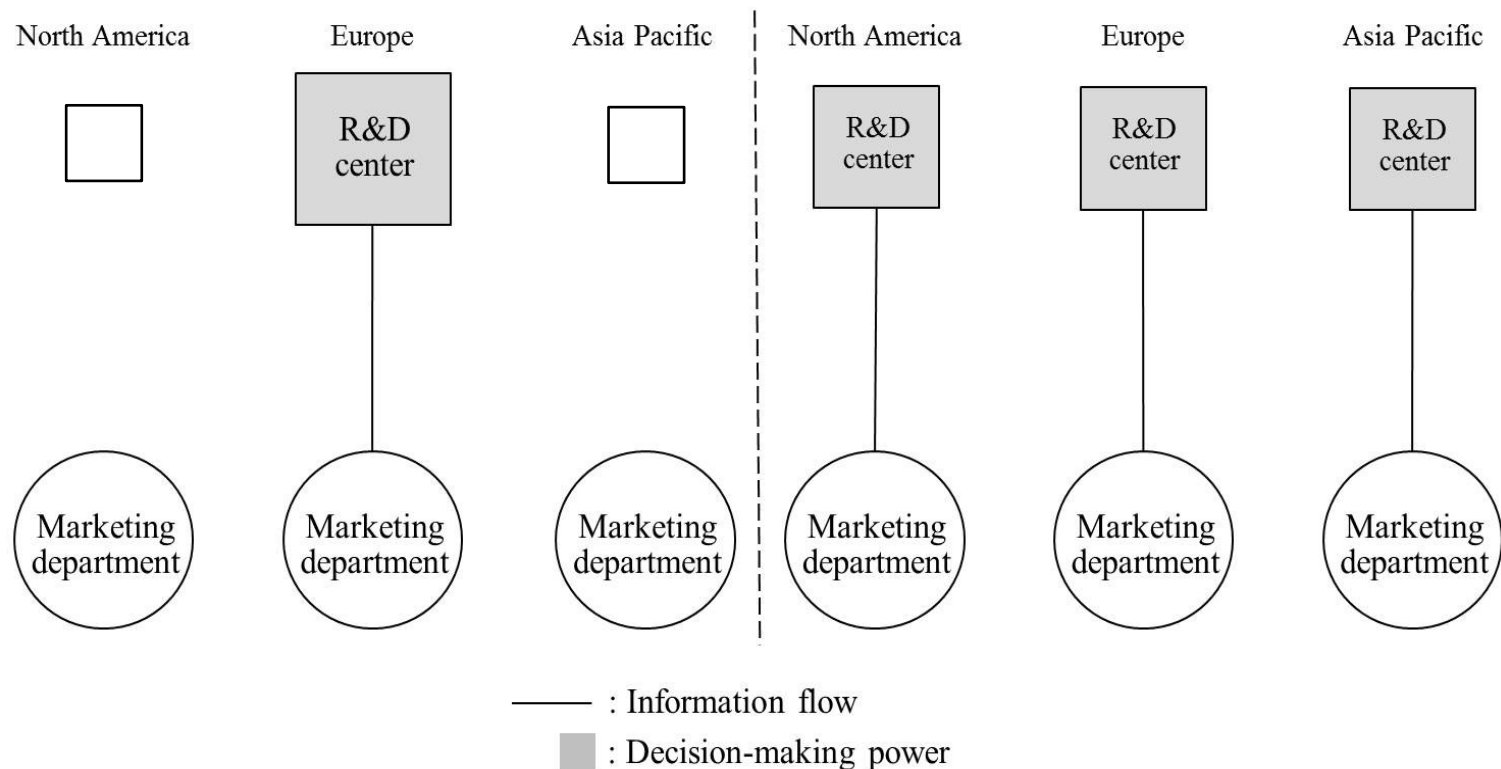
# R&D Structure – Traditional Models

- In 1990s, either multi-domestic or centralized to the home country, due to lack of IT tools.



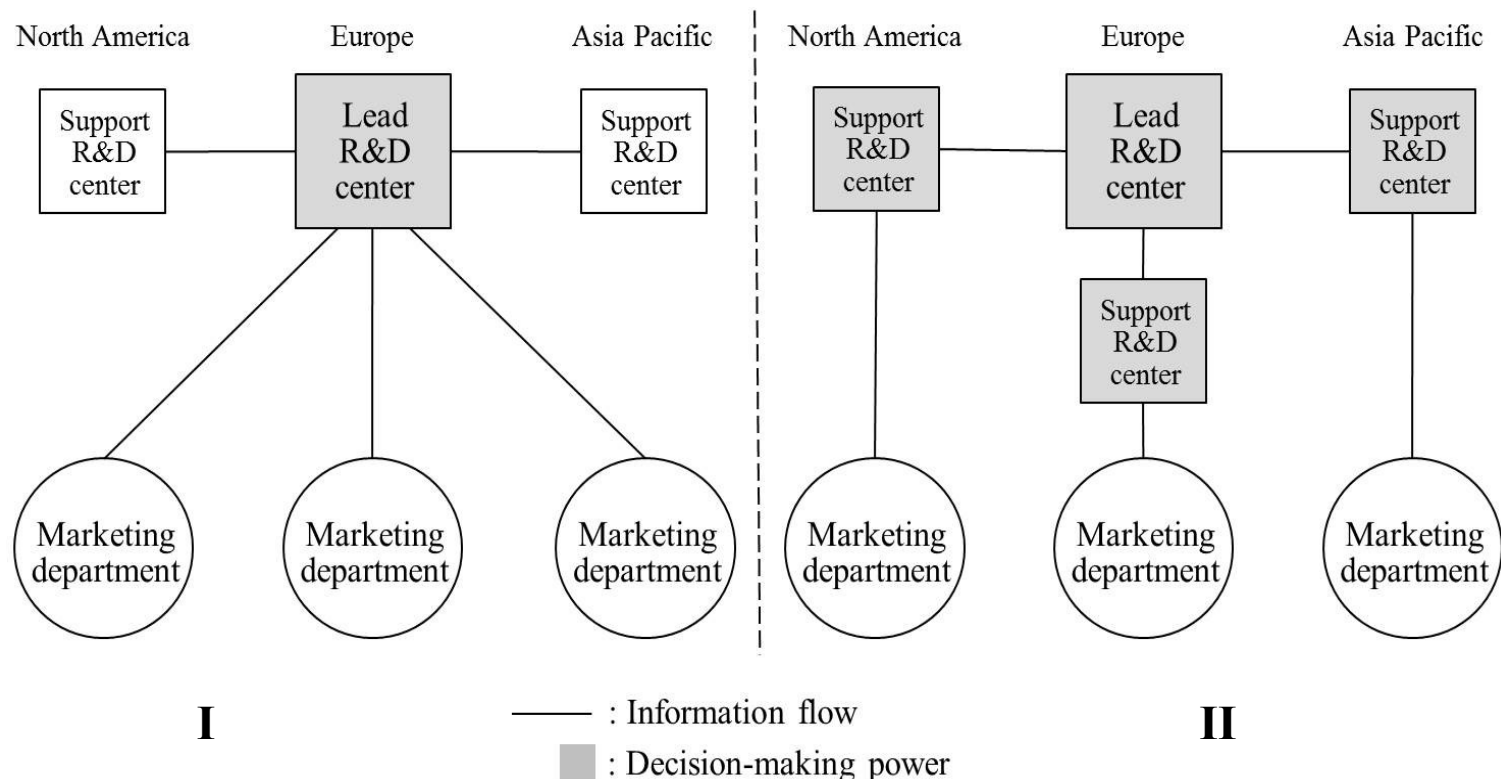
# R&D Structure – Traditional Models

- Pure global efficiency or local responsiveness.



# R&D Structure – Modern Models

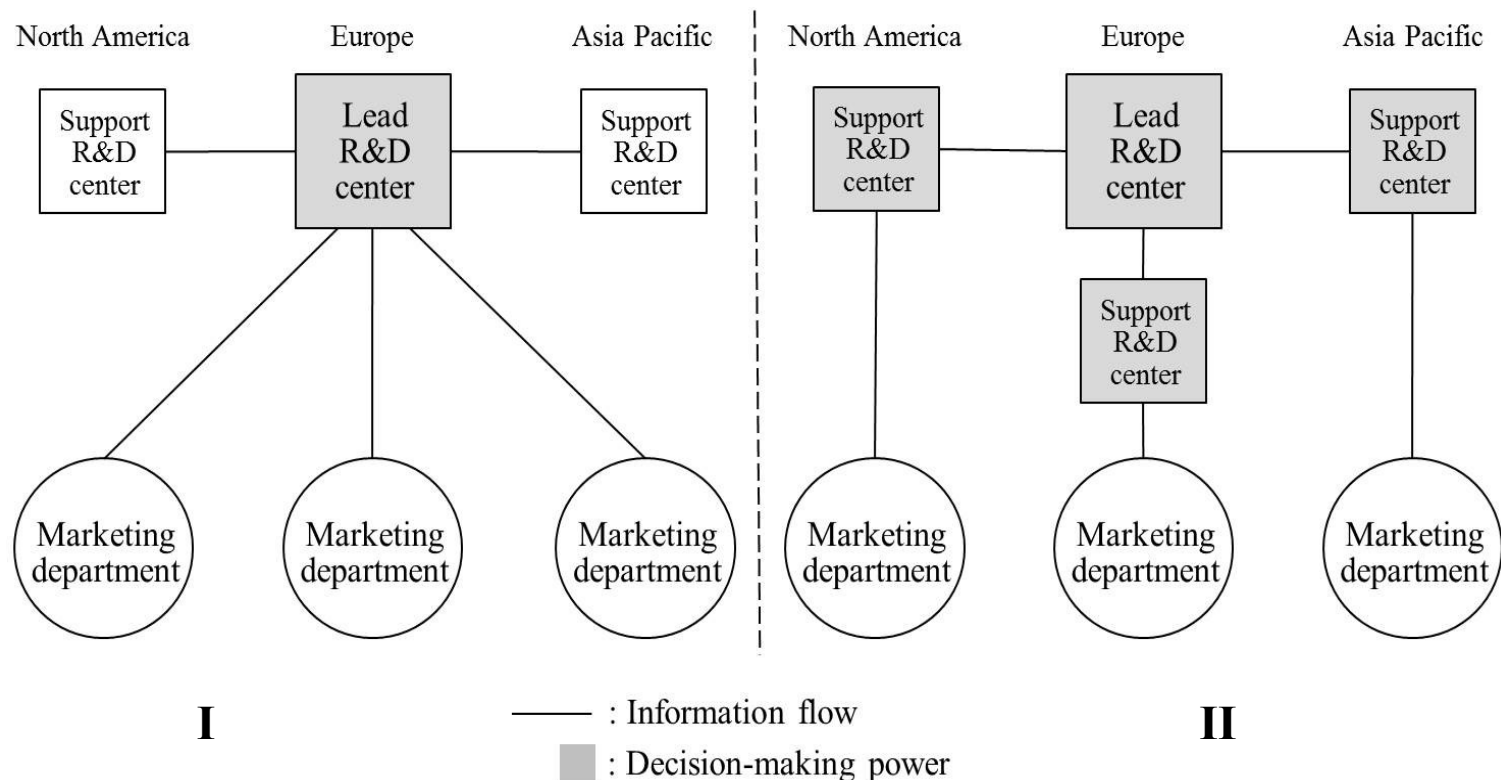
- More complex information flow and power dynamics. Two ideal types. Some companies may combine them.





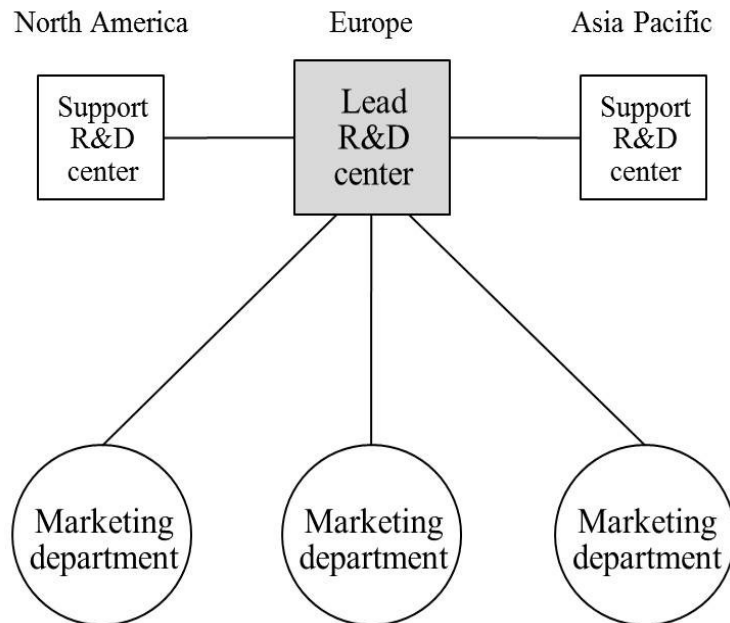
# R&D Structure – Modern Models

- Emphasizing both global efficiency and local responsiveness.





# R&D Structure – Modern Models



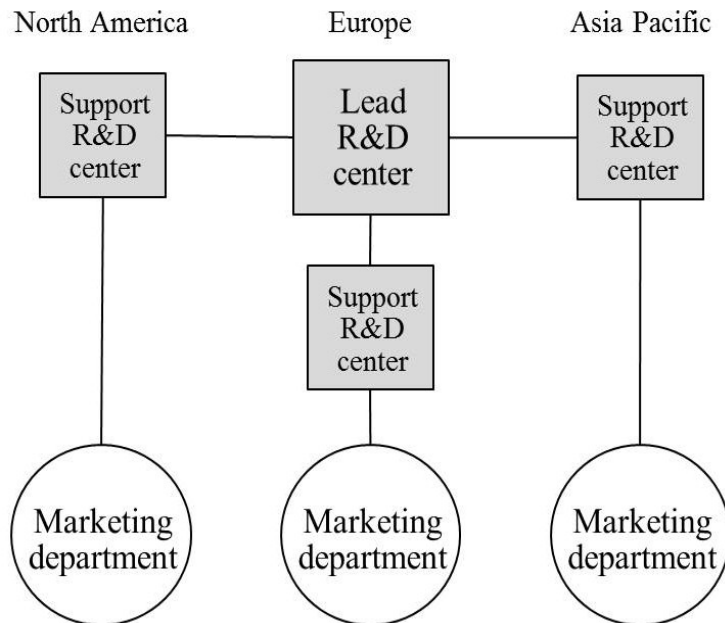
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## Key to success:

- Fair use of power.
- Lead center should have a global view.
- Fully consider requirements from different countries.



# R&D Structure – Modern Models



II

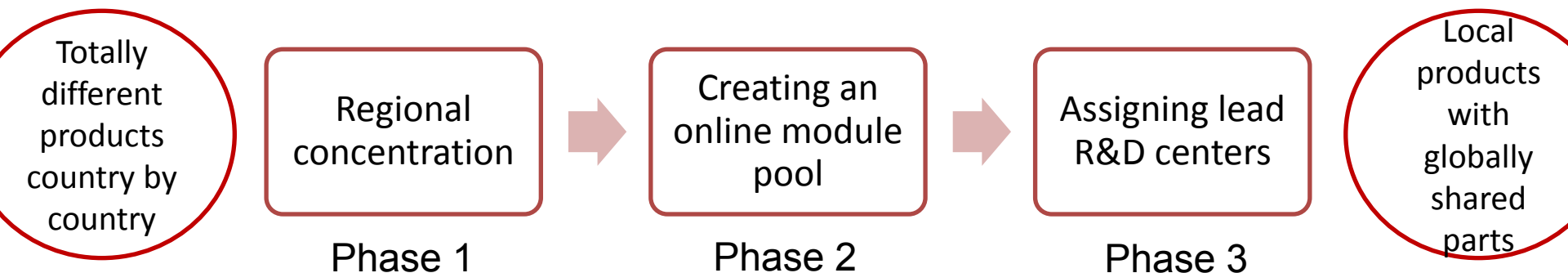
Key to success:

- Coordination capability and efforts of the lead center.
- Collaboration spirit across R&D centers.
- Lead center should have a global view.



# A Case Study of the Centralization Process

- A home appliance MNE headquartered in Europe.
- Historically a lot of acquisitions in UK, Germany Sweden, Italy, Spain, US, Brazil, etc.
- Decentralized R&D units operated autonomously.
- A three-stage organizational change.





# A Case Study of the Centralization Process

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- Phase 1: In the European region, the Italian R&D unit was assigned as the lead center. R&D units in other countries were reduced. No R&D capability.



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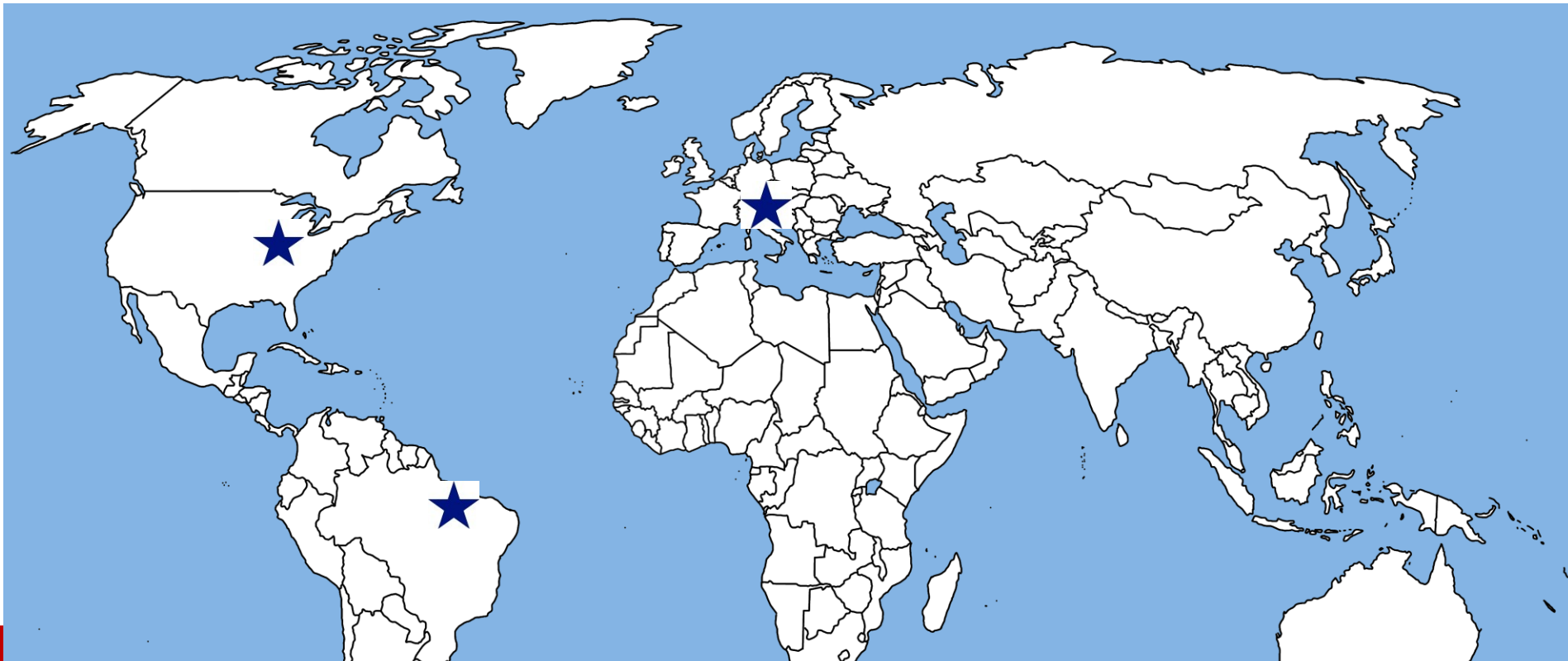




# A Case Study of the Centralization Process

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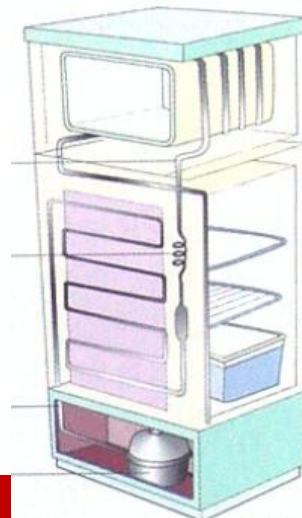
- Across regions, R&D units were still highly autonomous. Global concentration was not desirable. How to coordinate them?



# A Case Study of the Centralization Process

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- Phase 2: For interior components, modules were defined, such as control board, compressor, and condenser.
- An online module pool was created, to share the designs of modules developed by different regions (R&D centers).
- However, different design habits across R&D centers hindered sharing.







# A Case Study of the Centralization Process

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- Phase 3: Lead centers were assigned for each type: bottom-freezer, top-freezer, and side-by-side, etc.
- Lead centers have the global leadership for a type.



Side-by-side



French-door



Bottom-freezer



Top-freezer



Single-door



# Key Learning Points

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- International R&D conducted by MNEs can be complex.
  - Different R&D centers; different product categories; different local requirements.
- Organizational structures have been changed over the last decades due to the IT tools. They are more sophisticated now.
  - Yet, there can be different structures.
- The change of the organizational structure can take a long time with several phases.