Bi-directional Decision Making Innovation Model for Big Data: Combination of Target-Driven and Data-Driven Methods

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- **What is Big Data? [refer Wikipedia]**
  - Big Data is the term for a collection of data sets so large and complex that it becomes difficult to process using on-hand database management tools or traditional data processing applications.
  - The challenges include capture, storage, search, share, transfer, analysis, and visualization.

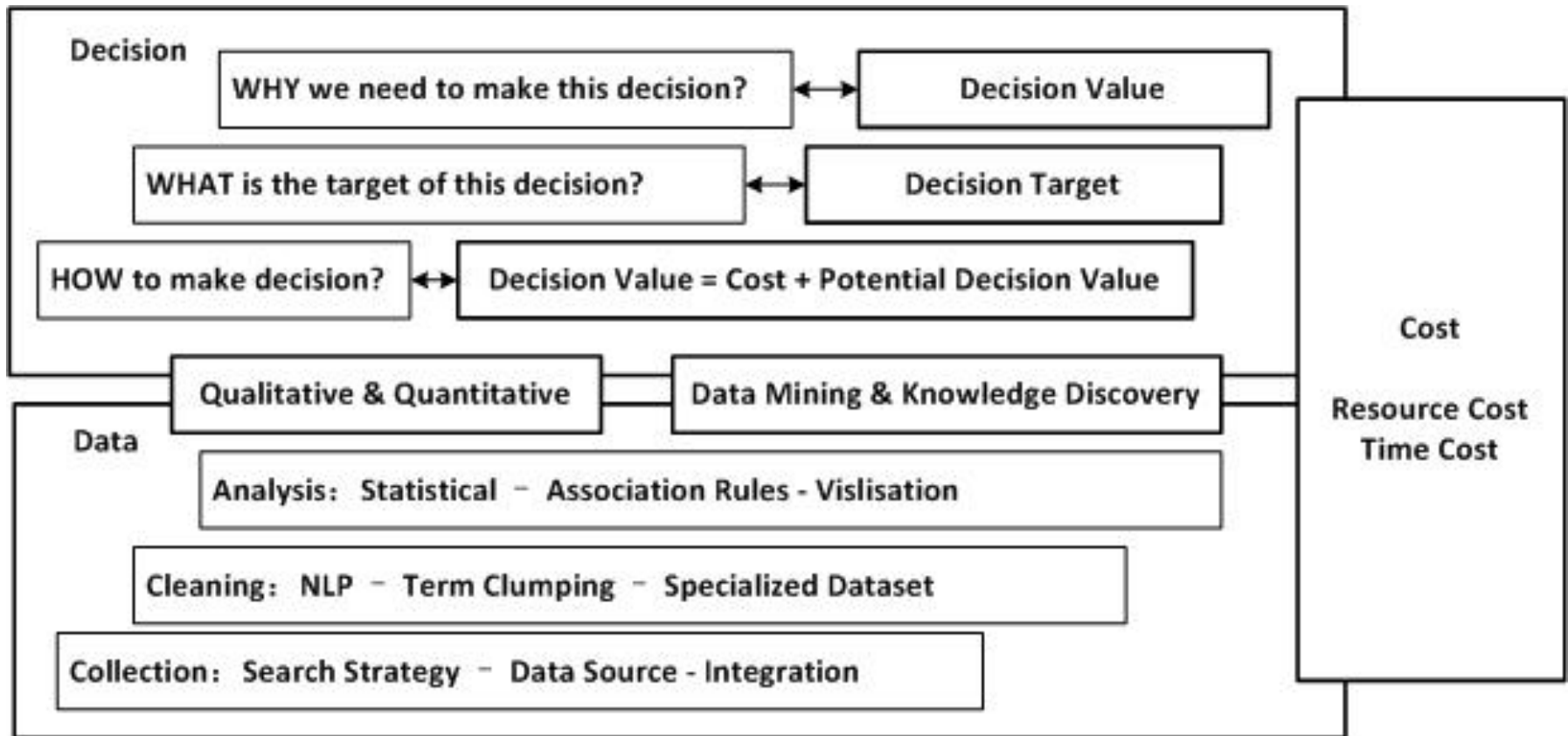Volume

Variety

Value

Velocity

Introduction

- **QUESTIONS**
  - How to deal with the challenges of booming data in **industrialization** and **informatization**, and construct the decision making processing for national **R&D strategy** in specific emerging technology domain?

  - How to transfer traditional **Tech Mining** methods to Big Data, and explore the potential insights and intelligence?

  - How to balance the traditional **target-driven** decision process with **data-driven** signaling in Big Data scope?
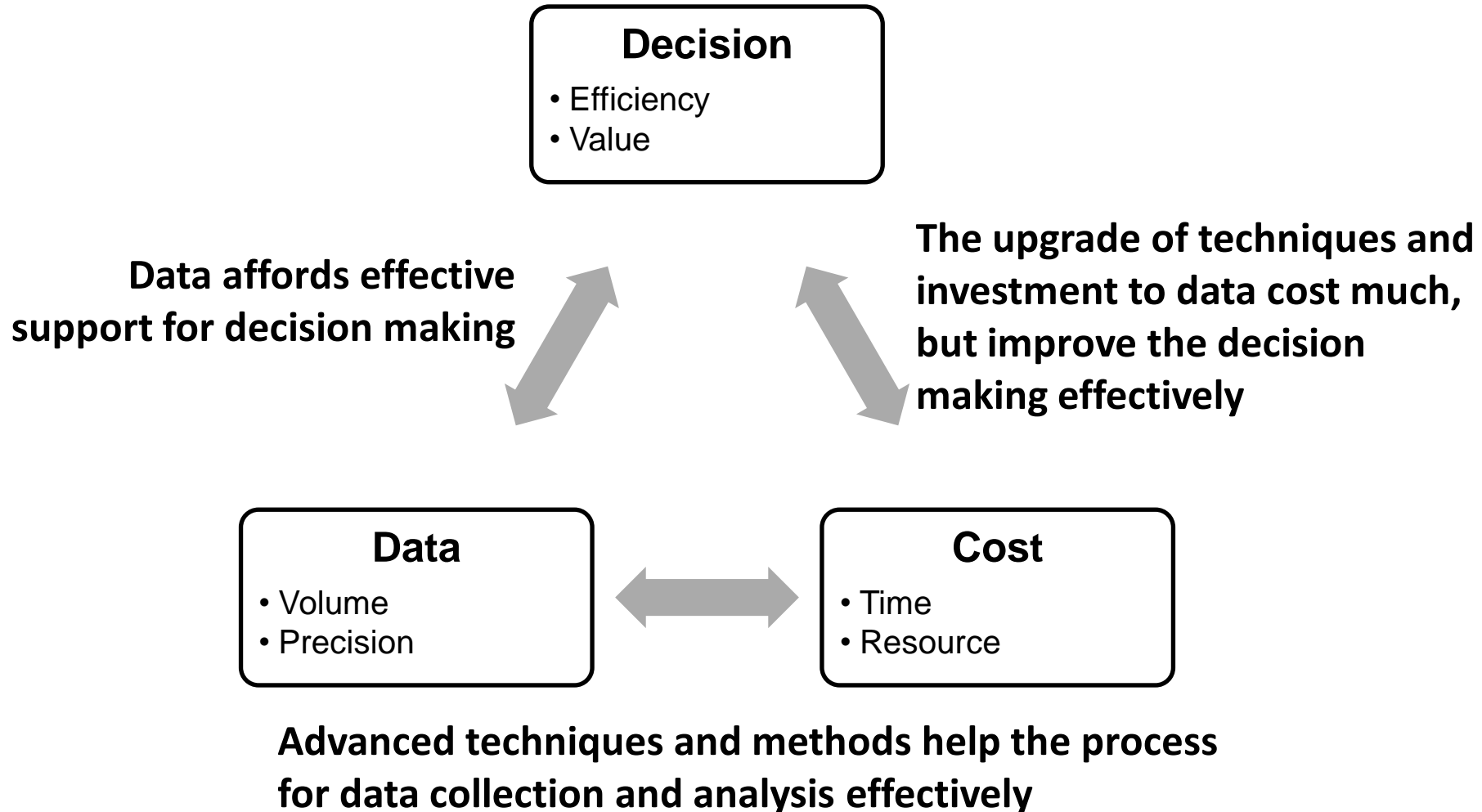
- **CONCEPTS**
  - **Combined Model with Decision, Data, & Cost**

Methodology

- **CONCEPTS**
  - **Relations among Decision, Data, & Cost**

Decision
- Efficiency
- Value

Data affords effective support for decision making

The upgrade of techniques and investment to data cost much, but improve the decision making effectively

Data
- Volume
- Precision

Cost
- Time
- Resource

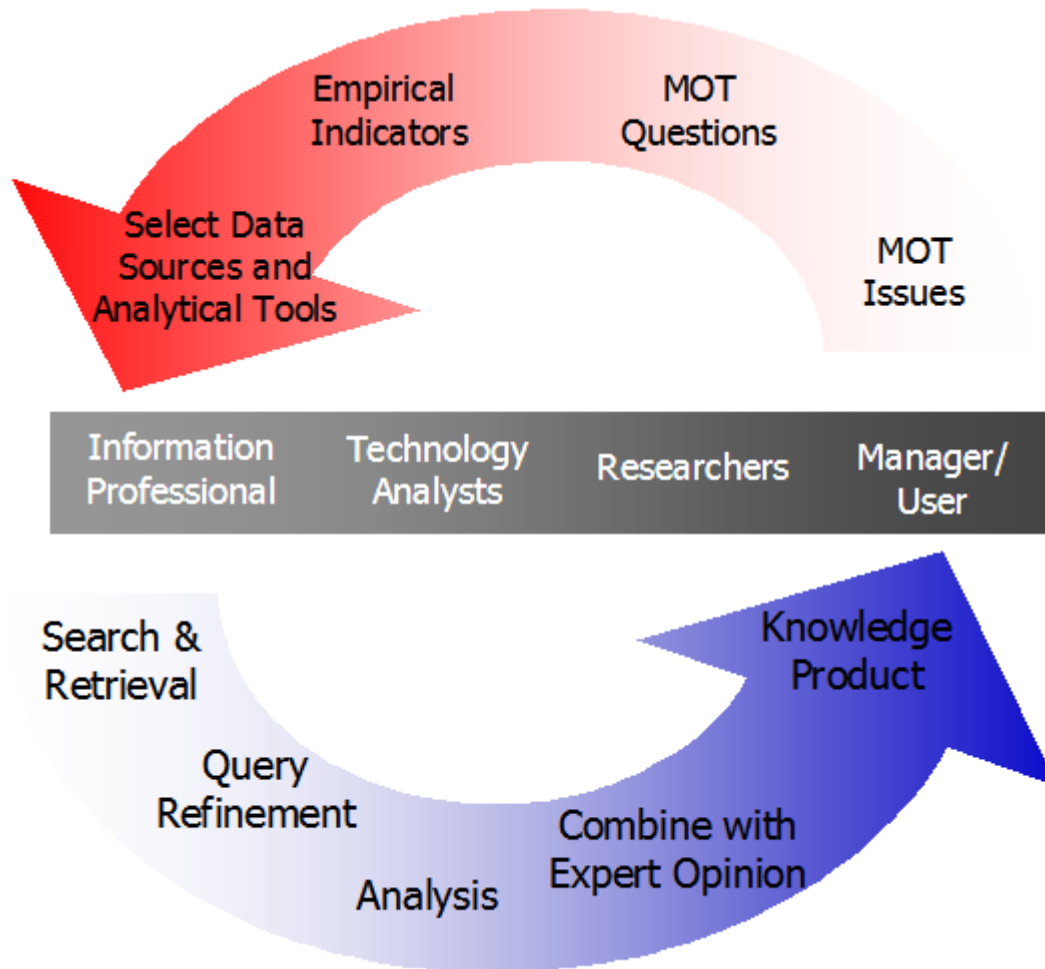**Advanced techniques and methods help the process for data collection and analysis effectively**

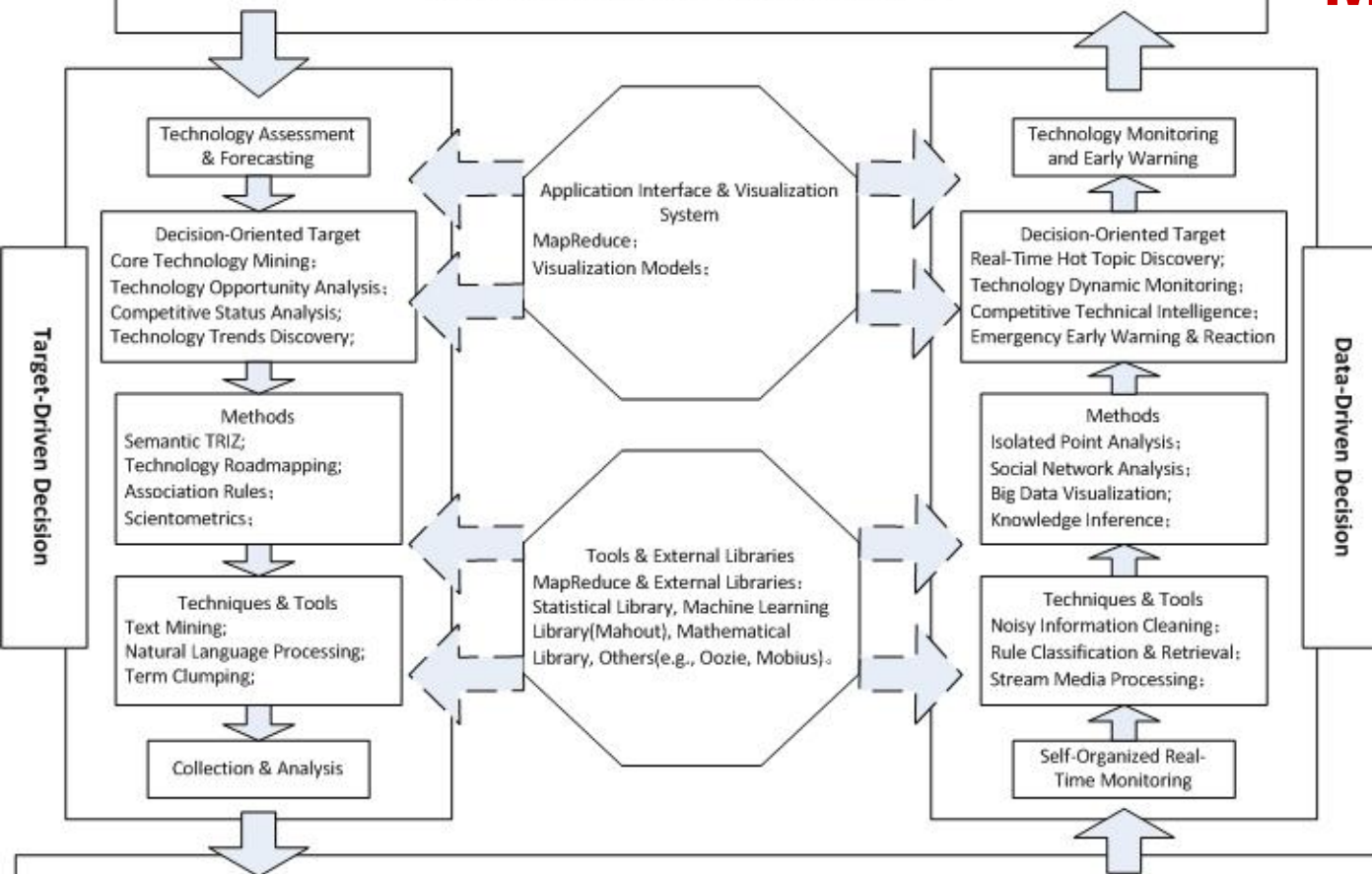- **Target-Driven Decision Making**
  - **Tech Ming**
  - ✓ **What's the target; What's the data; What's the method;**

- **Data-Driven Decision Making**
  - **Self-Organized Real-Time Technology Monitoring**
  - ✓ **What's the data?**
  - ✓ **What does the data indicate?**
  - ✓ **How to deal with the data?**
  - ✓ **How to visualize the potential insights of the data?**
  - ✓ **…**

  - ■ **The efficient ability to extract knowledge and insights from large and complex collections of digital data**
    - ✓ White House, USA - Big Data Research and Development Initiative

Methodology

- **Bi-Directional Decision Making Model for Big Data**

- **Target-Driven**
- **Data-Driven**

Empirical Study

- **BACKGROUND**
  - "Energy Conservation and Emission Reduction (ECER)" problem is a major concern for both national R&D management and technical sides.
  - Four decision-making capabilities are evolved
    - **Industrial Structure Adjustment**
    - **Energy Structure Adjustment**
    - **Technology Development**
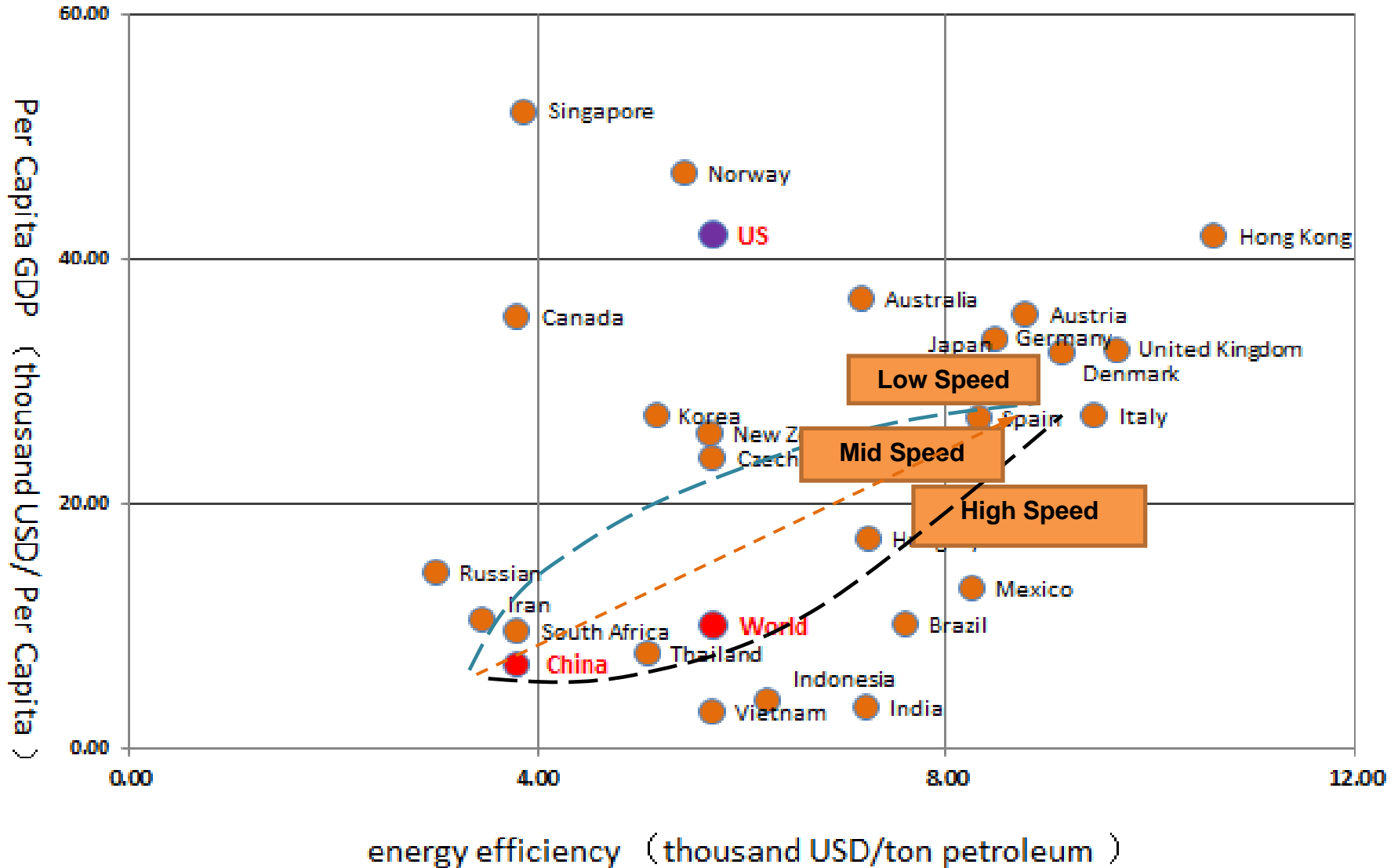   - **Organization Management**
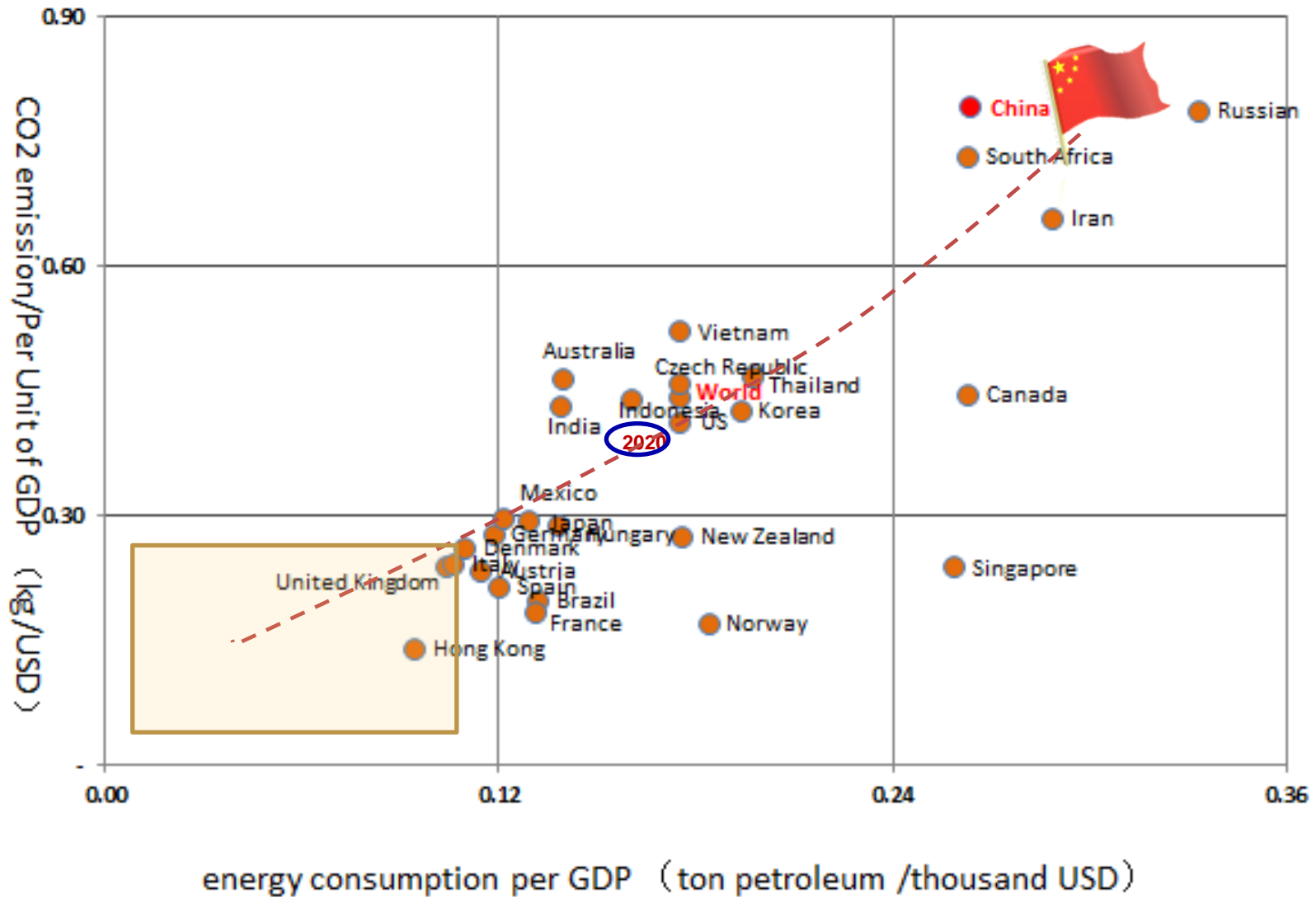
- **Global Energy Cost Comparison**

- **Global Energy Cost Comparison**

Future Work

- **Method**
    - **To continue the construction of the Triple Model with Decision, Data and Cost, and to enrich economic concepts to the methodology structure;**
    - **To combine our basic "Big Data Management Platform" with the "Bi-Directional Decision Making Innovation Model ," and to realize more function models and libraries.**
- **Empirical Study**
    - **To continue the ECER study based on our ongoing project with Ministry of Industry and Information Technology, PRC;**
    - **To expand our data resources to more web-related social media data.**

Thank You!

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