

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

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Abstract

Traditional approaches for decision making are influenced heavily by the coming of today's "Age of Big Data." Four obvious features – Volume, Variety, Velocity, and Value – are changing almost all processes of data management, involving retrieval, processing, storage, analysis, and decision making. Governments, enterprises, and institutes realize both the challenges and opportunities of Big Data, and are researching the fundamental instruments, analytic methods, and applications. Notable is the U.S. "Big Data Research and Development Initiative."

In China the "Energy Conservation and Emission Reduction (ECER)" problem is a major concern for both the management and technical sides. We draw on data mining techniques and a new "Big Data Management Platform" for ECER-related R&D information, industry data, and, especially, web data to address four decision-making capabilities:

- 1) Industrial structure adjustment
- 2) Energy structure adjustment
- 3) Technology development
- 4) Organization management.

Aiming to improve the ability to extract knowledge and insights from large and complex collections of digital data, we focus on means to turn massive data to actionable knowledge, and construct bi-directional decision making routines. These seek to balance target-driven decision processes with data-driven signaling. Our model strives to reach beyond short-term considerations to incorporate technology monitoring, forecasting, and assessment information and perspectives.