Exploration and Practice of Industry 4.0 in China

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Industry 4.0 and Integration of Industrialization and Informatization (III) of China achieve the same result by different methods.
III (taking Industry 4.0 and Intelligent Manufacturing as its goals) is a Complex Giant System which Requires Systematic New Theory and New Method to Meet the Development Needs in the Information Era.
Drawing lessons from Germany’s Industry 4.0 and other International Experience, China has built the III Management System aiming at Challenges of Chinese Enterprises during the Transformation and Upgrading Process

**Six Guides and Nine Principles of III Management System**

1. Attaining Sustainable Competitiveness as Focus
2. Strategy Consistency
3. Core Role of Leadership
4. Full Participation and Assessment
5. Process Management
6. Overall Optimization
7. Gradual Improvement and Perseverance
8. Innovation Leading
9. Open Collaboration

- Efficiency Improvement as Guide
- Data as Driving Force
- Service-Oriented as Direction
- New Capability as Mainline
- Process-Oriented as Point of Penetration
- Comprehensive Integration as Breakthrough Point

**key points**:
- Informatization + Industrialization
- Efficiency Improvement as Guide
- Data as Driving Force
- New Capability as Mainline
- Comprehensive Integration as Breakthrough Point
- Service-Oriented as Direction
- Process-Oriented as Point of Penetration
- Open Collaboration
Basic Framework of III Management System (taking Industry 4.0 and Intelligent Manufacturing as its goals)

Three Cycles and Four Elements of III Management System

- **Where to Go?** Strategy Cycle
  (Strategy-Sustainable Competitiveness-New Capability)

- **What to Do?** Element Cycle
  (Data-Technology-Business Process-Organizational Structure)

- **How to Do?** Management Cycle
  (Leadership Role: Plan-Support & Operate-Evaluate-Improve)
Standard Development and Industry Application of III Management System (taking Industry 4.0 and Intelligent Manufacturing as its goals)

- General Commonality
  - Basis and Terminology
  - Requirement
  - Practice Guide
  - Audit Guide
  - Industry Assessment Norms
  - New Capability System Framework

- Methodological Tools
  - Strategic Analysis
  - Management Optimization
  - Process Restructuring
  - IT Management
  - Data Mining
  - Performance Evaluation

- Professional Fields
  - Consulting Service Guide
  - Business Process and Organization Structure Optimization General Norms
  - Evaluation and Diagnosis Method and Requirement
  - Monitoring and Measuring Method and Requirement

- Reference Models
  - Strategy Cycle Reference Model
  - Element Cycle Reference Model (Organization, Process, Technology, Data)
  - Management Cycle Reference Model
  - Data Resources Reference Model
  - Infrastructure Building Reference Model

- Solutions
  - Intelligent Manufacturing Solution
  - Industrial Cloud and Intelligent Service Solution
  - Industrial Big Data Application Solution

- Industry Standards
  - Steel
  - Petrochemical
  - Mechanical
  - Vehicle
  - Light Industry
  - Textile
  - Electronics
  - Electric Power

: Completed National Standards Project Approval
Application Effects of III Management System (taking Industry 4.0 and Intelligent Manufacturing as its goals)

Number of Enterprises that Implement the Standards

- New Product Development Cycle: 32.6%
- Product Design Change Rate: 25.7%
- Enterprise Production Efficiency: 3.7%
- Quality Product Rate: 2.1%
- User Annual Complaints Number: 48.6%
- User Service Satisfaction Rate: 3.6%

Number of Service Organizations: 400
Number of Trained Personnel: 200,000

Note: No Data of Taiwan

Enterprises that implement and meet the standards gradually becomes key targets of local supporting policies, credit extension of investment and financing institutions and partners of leading enterprises.
Development Data Map of National Integration of Informatization and Industrialization (taking Industry 4.0 and Intelligent Manufacturing as its goals)

- **Six Views**
  - Assessment of Level and Capability: infrastructure construction, domain application, comprehensive integration, collaboration and innovation; Assessment of effectiveness and benefits: competitiveness, economic and social benefits

- **Three Mainlines**
  - Assessment of the three primary indicators—domain application, comprehensive integration, collaboration and innovation—from three main dimensions of the product, enterprise management and value chain

- **Four Phases**
  - Start-up construction phase, domain coverage phase, upgrading of integration phase, innovative breakthrough phase, which together characterizes periodical features and connotations of enterprises’ integration of informatization and industrialization
Development Data Map of National Integration of Informatization and Industrialization (taking Industry 4.0 and Intelligent Manufacturing as its goals)

Based on 60 subdivided industries, 31 provinces and municipalities, and more than 70000 enterprise data across the country

The number of enterprises participating in evaluation and diagnosis, benchmarking and guidance from 2009 to 2016

Development Data Map of National Integration of informatization and Industrialization in 2016

Note: Data of Tibet and Yunnan is inadequate, and no data of Taiwan is immediately available.
Development Data Map of National Integration of Informatization and Industrialization (taking Industry 4.0 and Intelligent Manufacturing as its goals)

- National integration of informatization and industrialization development level is 50.7, and in general is in the transition phase from domain coverage (Industrial 2.0) to upgrading of integration (Industrial 3.0)

The development level of national integration of informatization and industrialization is shown in the following chart. The median line is 50, and the development level has been increasing from 2012 to 2016. In 2016, the level reached 50.7. The chart also shows the percentage contributions of different factors:

- **Domain Coverage**: 47.3%
- **Upgrading of Integration**: 14.0%
- **Innovation Breakthrough**: 3.8%
- **Start-up Construction**: 34.9%
Based on the Development Data Map of National Integration of Informatization and Industrialization, a new pattern of data-driven policy-making for different industries is establishing quickly.

**Precise Policy-Making of the Government**
- Investigate the overall development status
- Set the development goals rationally
- Identify policy focus

**Precise Guidance of the Industry**
- Investigate the industry development status
- Capture key common issues
- Deepen the industry service content

**Precise Decision of the Enterprise**
- Implement the enterprise self-diagnosis
- Assist in the development planning
- Provide feasible pathway for improvement

**Precise Service of the Service Organizations**
- Identify target customers
- Analyze the demands of service objects
- Assess and improve service
Thank You