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## **MODELING & SIMULATION 4.0 : A PLAN FOR THE PROMOTION OF MANUFACTURING SERVICE IN SOUTH KOREA**

### **Abstract:**

Manufacturing industry has been playing a central role in the economic development of South Korea. According to Deloitte's report, the manufacturing industry of South Korea accounts for 30% of GDP and was ranked 5th in 2013 for its manufacturing competitiveness index. South Korean manufacturing companies have grown rapidly in the past decade, but productivity gains and overseas expansion have made it a "jobless growth". Employment and job creation in South Korea have shifted from the manufacturing sector to the service sector after the 1990's.

Fortunately, manufacturing service has become a new source of job creation in South Korea. In general, manufacturing includes a range of activities in addition to production. Service-like activities such as R&D, product design and business planning have become a larger share of manufacturing company's total business activities.

It is well known that Industry is on the threshold of its next revolution driven by the use of Internet of Things and Big data. Therefore, advanced manufacturing countries have been introducing a new national competitive plan, including the Industry 4.0 of Germany and the NNMI(National Network for Manufacturing Innovation) of the U.S., to promote and restore their own manufacturing industry by utilizing cyber-physical linking technologies like the CPS(Cyber Physical System) of Industry 4.0. The proposed modeling & simulation 4.0 plan is a South Korean manufacturing industry innovation plan which is to promote the manufacturing service industry of South Korea by proliferating a supercomputing based product modeling and simulation in the product development activities of manufacturing companies. Supercomputing based product modeling and simulation in a cyber space will play a key role in linking the virtual and physical world. By increasing the high performance computing(HPC) usages of manufacturing companies and expanding the business areas of modeling and simulation service companies, modeling & simulation 4.0 will be not only a great help to reduce the time and cost associated with developing and manufacturing a product but also will help in creating a large number of high value added jobs in South Korea.

### **Keywords:**

Modeling and simulation, Product development, Supercomputing, High performance computing, Manufacturing service

**JEL Classification:** A10, A19, L60