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## **AN ECONOMICS EVALUATION ON THE HPC BASED MODELING AND SIMULATION IN SME INDUSTRY**

### **Abstract:**

To overcome the global economy crisis, industries must take a revolutionary step and look for modern technologies. A computer modeling and simulation process has brought about dramatic innovation in the field of engineering. In the process of product design and performance verification, computer aided engineering utilizing HPC (High Performance Computer) and software for industrial products has significantly reduced product cost and time for development, thereby giving industries an opportunity to overcome the current crisis. Despite growing interest over developing HPC based modeling and simulation, there has been a poor return on investment in building effective and efficient HPC based modeling and simulation technologies. In this study, we also analyze the direct economic benefits from TCO(total cost of ownership) and SA (sales analysis)and not just the indirect benefits of each elementary technology into related industries. Furthermore, an economic assessment has been made by estimating B/C (benefit/cost) analysis for the benefits returned versus TCO of the system. The results showed that SME (Small-Medium sized Enterprise) industry showed a high benefit where the acquisition of the system resulted in 1.9 hundred million won of direct B/C effect and 0.9 hundred million won of indirect (B/C) effect. Even in the pessimistic scenario, the calculated B/C exceeded the current public discount rate of 6.25%. Consequently, the investment was fairly justified.

### **Keywords:**

Economics Evaluation, Small-Medium sized Enterprise, Modeling and simulation, Product development, High performance computing, Manufacturing service

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