Techniques for System of Systems Engineering in Construction of a Smart Tourism Industry Information System

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***Abstract*—Currently, as many disciplines begin to cultivate a set of core methodologies, system of systems engineering (SoSE), which has its root in context of military programming, becomes a significant research focus and provides a new perspective to solve the emerging "system of systems" challenges in industrial analysis. Meanwhile, modern communication and information technologies have provided greater possibilities for socio-economic sectors to execute smarter decisions, and these technologies may advance the industrial application of SoSE. Therefore, targeting the rareness of government-oriented intelligent decision support system (DSS), and guided by the underlying system of systems thinking, this paper proposes a technical framework for designing a policy maker-responsive smart information system which focuses: (1) system of systems structural architecting; (2) geographical simulation using time-series remotely sensed data, GIS instrument and simulation bodies such as cellular automata (CA) and multi-agent systems (MAS); (3) SoS evolution description through network analysis and intelligent computing; (4) measurement of SoS effectiveness with two-tier and four-grade method; and (5) SoSE program for industrial optimization. Its application in tourism analysis will provide a smarter base for industrial policy-making, planning and forecasting, and will help reduce risk and cost in industrial restructuring. For this relatively new field of SoSE application, tools and methods are not perfect, so it is important to draw together academia, government, industrial organizations and enterprises to collaborate for further valuable achievement.**

***Keyword*—System of systems engineering (SoSE), geographical simulation, tourism, smart industry information system, intelligent computing**

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