Overview

Author: *Tetsuo Sawaragi**

*Dean, Graduate School of Engineering and
Faculty of Engineering, Kyoto University

Future FA beyond DX: Tacit Knowledge and Systemic Thinking

In the manufacturing workplace of the future, automation and robots will be increasingly introduced due to labor shortages caused by a decline in the working population, and it will be necessary to accommodate irregular work patterns and improve the Quality of Working Life (QoW) of field workers. We must reconsider the production site as a "socio-technical systems" in which human abilities, production equipment, and work environments are complexly intertwined. After such a reconsideration, it becomes possible to monitor the cycle time of each process, predict future dynamics and shorten cycle times by making appropriate line balance adjustments by constantly acquiring work data on lines where people and equipment collaborate. However, to achieve these objectives, we will need to build holistic models of work activities based on Digital Transformation (DX), and by using such models, allow the tacit knowledge of skilled managers to be brought to bear on line balance management. This is what is known as a "digital twin" of the production site, constructed in cyberspace based on data. The twin must be applied to on-site operations in combination with human wisdom. Through FA which integrates systemic concepts, while emphasizing harmony with DX, we will achieve evolution toward next-generation production systems that can match supply with demand.