Scheduling in Engineering, Project, and Production Management

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This issue presents five papers selected from the 2013 (4th) International Conference on Engineering, Project, and Production Management (EPPM2013) held in Bangkok, Thailand. Three of the papers deal with scheduling problems faced in project and production management, while the remaining two focus on engineering management issues.

Scheduling is a crucial factor in engineering, project, and production management (Pinedo, 2012). Huang et al. applied Ant Colony Optimization (ACO) to develop a resource constraints scheduling model. ACO is frequently used to solve optimization problems (Chandra Mohan and Baskaran, 2012). In the paper, resource constraints are formulated using mathematical equations and optimized using ACO. International test bank data are then used to verify the effectiveness of the proposed model, which provides satisfactory performance with reasonable computational times.

Sirikijpanichkul et al. propose a combinatory input-output commodity-based approach to estimate truck trips on rural highway networks. The paper highlights the need for a trip scheduling tool especially for rural areas with deteriorated pavement conditions. Their research results could be helpful for rural, agricultural economies which depend on road transport to move crops during harvest seasons.

The third scheduling paper deals with make-and-pack production with multi-objectives including minimizing total tardiness, total earliness, total flow time, and total processing costs. Production requirements and constraints are formulated using mathematical equations. Possible solutions are measured by weighted average of satisfaction levels of all objectives and solved using a mixed-integer linear programming model. The proposed method overcomes the limitations in make-and-pack problems such as machine loading, batch selection, and batch sizing.

In the first of the engineering management papers, Imai and Kojima present a systematic process to compare the thermal comfort provided by radiant and convective heating systems. A small office room was modelled using simulation software to analyze temperature and airflow distributions in the room. Although radiant heating can provide satisfactory thermal comfort even when the room temperature is low, thermal comfort depends on the temperature of the air flow. The authors argue that combining both heating methods may effectively increase thermal comfort.

Mass rapid transit is an important means of mitigating urban traffic congestion. Sirikijpanichkul and Winyoopadit investigate the trade-off between initial entrance fees and demand for transit use. The authors found a fare policy that could reduce initial entry fares while still encouraging mass transit patronage, maintaining service quality, and providing sustainable revenue.

The inclusion of these five papers was made possible through the assistance of Thanwadee Chinda, Chair of the EPMM2013. We hope readers find these materials interesting and helpful in effectively implementing scheduling in engineering, project, and production management.

References

Pinedo, M. L. (2012). *Scheduling: Theory, Algorithms, and Systems*. New York: Springer.

Chandra Mohan, B. and Baskaran, R. (2012). A survey: Ant Colony Optimization based recent research and implementation on several engineering domain. *Expert Systems with Applications*, 39(4), 4618-4627.