

A mathematical model for the gamification of the decision-making process of a representative manufacturing system

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Abstract

The path for a management professional to become a successful leader is often long and requires high investments in qualification courses. In order to reduce training efforts of professionals with strong management skills, management games involving dynamic decision-making practices in a competitive environment have been successfully employed. This paper presents a mathematical model of a management game that considers a typical manufacture system, which can be inserted in a more general game incorporating thus other sectors of a representative goods producer. The model includes those decisions and interrelations considered relevant for the production management at the shop floor level. In order to achieve this objective, a mathematical model capable to simulate a factory was developed considering a degree of realism consistent with those decision situations that a player undergoing training would face in practice: capacity and layout planning, line balancing, master production and scheduling planning, material planning, among others. Other competitors, represented by other players with similar products and manufacturing systems, compete for the same market, creating a competitive environment that induces additional motivation to look for those decisions that promote advantages for the virtual companies they are managing. The dynamic decision process generated by the game tends to provide an environment of "learning by doing", without prejudices in operations of a real shop floor. The insertion of the proposed model in a general management simulation model which includes supply management, marketing, logistics, costs and accounting allows the player to assess the impact of his decisions at the shop floor level over other sectors, especially in the accounting results report.

Keywords

Gamification, Management Games, Shop Floor Game, Learning by Doing.

Biographies

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