DEVELOPMENT OF A SMART SUSTAINABILITY OPTIMIZER (SSO) ALGORITHM FOR COMPLEX MANUFACTURING ENVIRONMENTS SUCH AS FACTORY WORKSHOPS

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Abstract. In this paper the concept of the Smart Sustainability Optimization (SSO) is presented; a specialized optimization tool for manufacturing environments. The role of the SSO is to form an integral part of a Manufacturing Execution System and interact with other subsystems (conventional scheduler) or tools (PLM, ERP) in order to provide improved and optimal production schedules from the sustainability point of view and make the process “smart”. The SSO tool may not only optimize the production at the planning/scheduling level; it may also interface other optimization levels towards a global sustainability optimization of a product. It selects the optimal production schedule based on available schedules, sustainability evaluations, time & cost information and any product LCA & ERP inputs needed, while working on-line using the current information and can be invoked whenever a new schedule or re-schedule is required. The test use case is a factory shop floor with up to 30 machine tools that should be optimized for sustainability in production (e.g. energy, social and emissions key performance indicators).

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