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TITLE OF DIPLOMA THESIS:

Evaluation of Design Structure Matrix Approach in Project Scheduling

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ABSTRACT

The present thesis is attempting the Evaluation of Design Structure Matrix (DSM) Approach in Project Scheduling.Three main axes are distinguished: (1) the approach of Design Structure Matrix Method, (2) the approach of technique Modeling Architecture Process and the use of DSM Architecture of Process, and (3) the use of software package DSM@MIT_ver1.9 which is based on an integrated framework of project management.The key elements of the Method DSM and its tool, the process of developing a DSM, the categories and types of DSMs, and also their advantages and capabilities are quoted. At the approach of technique Modeling Architecture Process and the use of DSM Architecture of Process, are presented the basic analysis process of DSMs, Partitioning Analysis and Resolving Coupled Blocks Analysis, and their most applied methods Sequencing and Tearing, and also Banding Analysis and Advanced Analyses Methods. As well, the advantages and the capabilities of DSMs in highlighting and analyzing the points of process systems architecture that require separate consideration, such as dependency patterns of repetitive processes, are quoted.The used software package DSM@MIT_ver1.9 is a tool for implementing an integrated framework of project management, which is using Method DSM and Advanced Simulation. The Method DSM is used for the analysis of the project process architecture in order to obtain a better understanding of how its results are produced and highlight the points that need improvement, for the production of a simplified process model. The Advanced Simulation is used for the approximation of the anticipated project schedule based on the whole process structure and the dynamic characteristics of the parameters that are involved in the process. The indicated sequence of using steps of the package and the interpretation of the results that are produced by applying the package analyzes are presented upon consideration of a process example that includes iterative processes in the environment of limited resources. Finally, a comparative assessment between the capabilities and the results of DSM@MIT ver1.9 and software package Microsoft Project 2010 is carried out in order to ascertain the differences of the DSM Method appliance in project scheduling against to the classical used methods Critical Path Method (CPM), Program Evaluation Research Technique (PERT) and techniques Resource Constrained Project Scheduling Problem (RCPMP) and RCMPSP.

KEYWORDS

Design Structure Method (DSM), Advanced Analysis Methods, Project Management, Process Architecture Modeling, Partitioning, Sequencing, Tearing.