A CASE STUDY OF PRODUCTION LINE BALANCING WITH SIMULATION

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ABSTRACT

The purpose of this paper is to simulate production line improvement using computerized simulation software. The model is developed based on current state operation system which had been identified to have imbalanced performance between 18 workstations. The paper presents the analysis of simulation model to overcome the stated problems. The findings found that by having balance production system in assembly line will be able to optimize overtime and job performance while eliminating a number of buffer stock (work in progress). The results also encourage the multi-tasking and job rotation which can promote job optimization.

Keywords: simulation, line balancing, assembly line

INTRODUCTION

Assembly lines are flow oriented production layout used for well-organized and mass production of products (Boysen et al., 2007). An assembly line consists of a certain number of workstations located beside material handling system (e.g., on conveyer belt etc.) which are composed of particular tasks. Assembly workpieces are moved down the assembly line from one station to another for different assembly operations. Assembly of parts is divided into a set of a small number of operations. These operations are called tasks related to certain assembly product and there exists precedence relation among different tasks. These precedence relations among tasks are used to define the appropriate priority of performing certain tasks relative to other tasks in the assembly operation of the product. Assembly line balancing problems are mostly focused on identifying feasible line balance which can satisfy all the precedence constraints and some other restrictions which may include some of the objectives of the problem (Saif et al., 2014).