Proceedings of the 2nd Annual World Conference
of the Society for Industrial And Systems Engineering
Las Vegas, NV, USA
November 5-7, 2013

A Comparison of Methodologies for a Redesigning Tractor Assembly Line

C Uribe and E Carrum

Corporación Mexicana de Investigación en Materiales S.A de C.V.

Corresponding Author's Email: carla.uribe@comimsa.com

Author Note: Carla Uribe is an Industrial and Systems Engineer and is currently working as an assembly manufacturing engineering in John Deere Tractors and is also student in the master´s degree at the "Posgrado Interinstitucional the Ciencia y Tecnologia " in Corporación Mexicana de Investigacion en Materiales S.A de C.V. Elias Carrum is a professor in Industrial Engineering at the "Corporacion Mexicana de Investigacion en Materiales".

Abstract: In this paper is presented the case of study to optimize the facility assembly line in John Deere specifically inside the chassis assembly line for this case is used three different methodologies. The first one the Systematic Layout Planning which is based in 3 fundamentals parameters: the relationship between departments, the space floor and the adjustment. The SLP has been the most used methodology to solve facility layout problem applying qualitative criteria. The second one ant colony optimization is a technique which it basic idea is to imitate the cooperative manner of an ant colony to solve combinatorial optimization problems within a reasonable amount of time and the last one Linear Programming can be defined as the problem of maximizing or minimizing a linear function subject to linear constraints, the constraints may be equalities or inequalities. The goal of this paper is apply these methodologies in some different processes with other facilities including the tractor assembly line the best solution will be used to decide which methodology is the best to minimize the distance between work stations and their material and minimizing the material transportation too. Having minimizing the distance and the transportation the result of this will the maximization of the space floor and consequently the assembly line efficiency is increased. If the Systematic Layout Planning, Ant algorithm or Linear Programming achieves the objectives with the assembly line constraints the best solution will be applied in the tractor assembly line to optimize the process.

Keywords: Layout Optimization, Ant Colony Optimization, Linear Programming.