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THE DYNAMIC MANUFACTURING COMPANY

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ABSTRACT

The Dynamic Manufacturing Company is a management simulation that enables participants to better understand the dynamics of traditional manufacturing. The goal is to sensitize participants to the decisions and problems that managers must make daily to assure the manufacturing goals of any company are achieved. The Dynamic Manufacturing Company manufactures two subassemblies that are later assembled by the end user. The products are in high demand and the wholesalers have stated that they are willing to purchase all of the product that TDMC is able to produce, given they are in balanced quantities. This balance is required due to the fact that customers must use both types of units in tandem. The wholesaler has stipulated that they will accept an imbalance of +/- 1 piece per week. Units in excess of the imbalance will not be purchased by the wholesaler and can not be stored for use in subsequent weeks. The role of management in the simulation is to maintain equilibrium of the product mix by implementing various managerial strategies.

The environment in which TDMC operates is somewhat turbulent and as a result the company may experience unexpected events. Systemic problems, such as randomness of the quality of raw materials received from the vendor or a lack of qualified labor, are not unusual. However, the participants are not at the mercy of these random events. There are a number of managerial strategies that can be implemented. Management may decide to purchase additional machines, add overtime, purchase buffers or acquire slack resources.

The internal operating environment of TDMC is characterized by high interdependence between subsystems in the cycle. The conditions in the operating environment are such that the elements in the production system are "tightly coupled".

The manufacturing process is best described as sequentially linked and is structured around five workstations. Each workstation is equipped with one machine that adds value to each unit. The next workstation pulls Work-In-Process from the previous workstation, adds value and so on. Workstation output is determined by the roll of a die. A low roll simulates a day plagued with machine breakdowns or high absenteeism, while a high roll represents a day when everything is running as planned.

The Simulation starts with each of the five workstations loaded with four units of W.I.P. and four units in a W.I.P. queue between each workstation (two of each color). There is also a two-week delay of raw material from the vendors (initially eight units). Therefore, 44 pieces of W.I.P. are in the system at the onset of the simulation. It is the responsibility of management to ensure that at the end of the five-week exercise W.I.P. has not increased past the initial 44 units. In the event that excess W.I.P. exists, a per piece penalty will be imposed.

Defective material has been predetermined to occur at random and will be identified by the facilitator. Some defective material may be repaired in the "Repair Department". Defective materials are returned to the workstation at variable but predetermined times. Also, some materials are defective beyond repair, they are considered "Scrap" and are a loss to TDMC. There may be occasions when a workstation may have units on backorder. Unfilled orders must be filled on the subsequent day or ASAP. Backorders will be carried over from week to week. It is important that management assure that all backorders are filled by the end of the fifth week as any unfilled backorders represent loss of sales, which will therefore be charged back against total sales.

TDMC also provides an environment where participants can differentiate between operational and managerial decisions and then experience the consequences of their decisions and their impact on the entire system.