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Over the past year, Company X has rapidly outgrown its warehouse at the pressure control facility, which has caused a lack of storage area. Due to this severe lack of space, the warehouse is using a randomized storage system to store the inventory. A cycle count system is performed daily to verify current inventory numbers in the pressure control facility. The database determines which parts need to be counted depending on their classification in the ABC system.

Within the cycle count system, parts are categorized by their level of revenue generated in an ABC system. An A part is considered top dollar parts and are counted four times a year. B parts are considered middle dollar parts, and the cycle count is performed three times a year. Commodity items are considered C parts which are counted twice a year. An annual count is performed on slow move parts, D parts.

Daily, a group of warehouse pickers perform the cycle count procedures. A set of pick sheets are distributed for the employees to count. The employees are responsible for counting the items on the pick sheets, and are given a limited amount time to search, if the part is not observed in the recorded location. Once completed, the counted numbers on each pick sheet is compared to the database. If these numbers do not match, a second count is performed by a different warehouse picker. If by the end of the second count the numbers do not match, a researcher will be given the specific part/pick sheet. The researcher will search for the missing part and if unable to locate the part will take corrective action.

The first count accuracy is sporadic varying from 45 to 95 percent. This has forced Company X to write off a substantial amount of money in 2008. **The purpose of this project is to identify the major causes of these inaccuracies. Upon identifying the inaccuracies, recommendations of necessary improvements will be made.**

The objective of the project is to identify major causes of the inaccuracies and develop recommendations. Our goal is to ultimately reach and maintain a first count accuracy level of over ninety percent. These recommendations will reduce costly inventory write offs, lead time in locating and obtaining parts, and resources spent when searching for misplaced parts.

(2)

Senior Design Team, consists of Texas A&M Industrial Engineering students and has been contracted by Company X to analyze their current Product Assembly (PA) operations and to provide decision support tools that will assist in developing optimized Order Release Quantity (ORQ) for their PA production runs. While ORQs are the main focus of the project, the support tool will also reveal how specific changes will impact several other parameters of the PA manufacturing process.

Company X's facility manufactures widgets, gadgets, and various other related equipment. Each of these products can consist of multiple PAs. The scope of this project encompasses only the PA portion of manufacturing and ordering, not the box building process of the final products. Currently, Company X does not have a model in place to simulate its PA manufacturing processes or order scheduling. Senior Design Team wishes to develop several dynamic computer models that are sensitive to various parameters, thus allowing Company X to easily simulate possible changes in PA production and ordering before implementing them on the factory floor. The effects on ORQ by any changes considered can then be compared and the optimum result chosen. The value of optimizing this quantity is to minimize the inventory, yet still be able to satisfy demand.

The PA production line operates using a pull system so that widgets are pulled from finished goods inventory and used in final products. When widget inventories fall below the specified Re Order Point (ROP) quantity, a production order is triggered and new widgets are manufactured. The computer modeling will begin at these inventory triggers and continue through the manufacturing process. Due to this pull system approach, the models will be built using the simulation program ARENA, which can very accurately account for a demand-pull environment. The models will be driven by data provided from Company X factory time studies.

When completed, DST Consulting will provide Flextronics with a series of decision support tools and analyses that will provide the following:

- Easily updatable ARENA models of the entire PA manufacturing and ordering processes.
- The ability to dynamically change various parameters, such as MOQs and ROPs, and view the impacts of these changes.
- A full report detailing the interactions between Order Release Quantities, Minimum Order Quantities, Reorder Points, and Cycle Times to Replenish. The analysis will also include optimal Order Release Quantity levels. Time permitting; a scheduling analysis will also be performed.
- Minimize PA inventory levels while still satisfying demand

Company X will receive a presentation and final report in May detailing the results of the project. A full analysis of the outcomes will be included in the report, as well as detailed recommendations.

(3)

Company X is a leading provider of financial widgets in Texas. As a result of their growth and as an added service to their clients, Company X also provides financial widgets for workers outside of Texas, granted they meet certain requirements. It is in this area, that the department of Financial Widget Oversight (FWO), that Company X is operating inefficiently. Their core business is in issuing widgets to clients inside of Texas, which is handled very proficiently through the use of an effective system. Unfortunately, due to the nature of the business, Company X must rely heavily on a third party's system. This results in a very tedious and manual operation that results in immensely higher cycle times for FWO processes. The higher cycle times in turn result in a more expensive operation and a flustered work force.

The team will concentrate on improving the FWO processes. Company X has provided specific "pain points" that should be given special consideration, but every process will be thoroughly analyzed to determine a more efficient way of completing the tasks, with the ultimate goal of reducing cycle times in all areas of the FWO. After carefully reviewing a time-motion study provided by Company X, it is clear that special attention will be given to the "generic" process, as this is the area that utilizes the most time.

In order to effectively solve the inefficiencies in the FWO processes, the team will utilize three valuable and tested Industrial Engineering tools. Two simulation models using ARENA will be built. The first model will expose any and all bottlenecks in the current process so that more emphasis may be placed on those steps of the process. Eventually, a second model will serve as an explanatory one demonstrating how much time may be saved by implementing the recommendations. A value stream mapping of the process will be performed to determine what steps are critical and which are repetitive and unnecessary. Based on this tool, the team will proceed with designing creative alternatives to current tasks. An economic analysis of all recommendations will be constructed in order to substantiate all proposals.

At the conclusion of the project, Company X will receive the following:

- A visual, easy to understand value stream mapping model of the FWO processes.
- A series of recommendation for future improvements.
- An Arena model simulation of the current and improved processes including all decision variables.
- A thorough report that will have detailed information, including an economic analysis of the impact of the changes recommended and the potential benefits they could generate.

(4)

The Senior Design consulting team is looking forward to the opportunity to work with Company X in their redesign of a repair facility located in Texas. Our team believes the task is essential to the smooth operation of Company X's facility in the future and will provide our team with an invaluable experience working with Industrial Engineering principles in industry.

Company X is a leading manufacturer of widgets. In the recent past, sales of Company X widgets have increased. As that batch of widgets ages, they will require routine, but major, maintenance to be performed at the Texas facility. Company X engineers are currently in the process of retooling the facility to move out non-related functions and focus on widget repair in order to handle a forecasted increase in repair jobs. More specifically, the facility will only be repairing the widget accessories (WA).

WA undergo an expected amount of wear over their lifetime. During a normal course of operation, WA are exposed to extreme conditions while maintaining exacting tolerances; these conditions will cause the WA to become damaged and the widgets to lose efficiency. In addition to normal wear, WA will be damaged by coming into contact with foreign objects. Therefore, WA must be repaired both on a schedule and randomly after unexpected failures. Due to Company X's increase in widget sales in the recent past, an increase in WA repairs are expected. In its present state, the Texas facility is not expected to be capable of meeting future demand.

Company X has requested that the Senior Design consulting team work in parallel with their engineers to produce an independent solution to their facility issues; their hope is that engineering students with no knowledge of Company X's current practices can bring fresh and innovative ideas to the table. As defined by Company X, the main deliverable from the Senior Design consulting team will be the design of a manufacturing layout for their widget repair process. This manufacturing layout will have a strong focus on incorporating lean manufacturing principles.

In order to produce an ideal facility layout, several Industrial Engineering tools, such as computer simulation and analytical models to include relationship diagrams, will be used to analyze data provided by Company X to better understand the interdependent relationships between departments and processes within the widget repair process. This analysis will be used to produce a layout which will aid in making the repair process as lean as possible. Next, the proposed layout will be modeled by the simulation package, Arena. An Arena simulation will account for many real-world variables, be flexible in both the design and analysis of a layout, and will produce an accurate estimate of the facility's capabilities. Lastly, Arena will be used to simulate batch sizes in order to increase the efficiency of both the facility and its workers.

Upon completion of the project in May, deliverables to Company X will include:

- A facility layout incorporating lean manufacturing principles
- Analysis of the teams Arena model, not quantify operating characteristics under a range of operating parameters.
- A recommendation on optimal batch sizes for the new layout.

All deliverables will be presented to Company X through a Final Report and Presentation on <date>. The Final Report will discuss in detail all results, findings, and methodologies.