

Team 6–Triumph Executive Summary

The purpose of this report is to present a solution methodology for a shop floor control issue faced by Triumph Group, Inc., which is a manufacturer of aviation systems and components such as turbine shafts, rotorcraft masts, and landing gear. Its manufacturing services also encompass the oil and gas, and nuclear industries. The problem encountered at Triumph Group, Inc. was that shop floor operators were not adhering to the policy of clocking in and out of manufacturing operations. This policy allows the management to keep track of resources, labor division, productivity and cost accounting. Therefore, the objectives of this project included the analysis of clocking data, review of the capabilities of the existing ERP system, pinpointing specific operations or operators that are leading to the most inconsistencies, gathering more relevant data from operators, and the formulation of appropriate solutions to the given problem.

The problem-solving approach adopted in this project involved four main steps. First, the problem was clearly communicated by Triumph Group, Inc. and identified, Next, the supplied data was acquired, analyzed and interpreted in order to reflect the state of the current clocking process within the plant. The third step included the identification of candidate root causes based on the analyzed data and meetings with Triumph Group, Inc. Finally, a variety of solutions were proposed according to the identified root causes. Different aspects of the problem-solving process were then divided among the team, and weekly team meetings were organized in order to ensure that progress was made in the solution development methodology.

The data analysis portion of the project involved going through the different manufactured parts and the respective operations that are needed to manufacture them. This

involved finding the number of operations and parts, in which operators failed to clock in or out. Once these “violations” have been identified, a Pareto analysis was done in order to find the parts and operations that caused the greatest increase in the number of violations. The remainder of the analysis will then be targeted to the operations and parts that were identified using the Pareto analysis.

Once the data has been analyzed, several possible root causes were identified. These included operator behavior, shop floor layout, technical issues, and shop floor supervision. Operator behavior encompasses any social and cultural issues that might prevent operators from clocking in and out. The shop floor layout root cause deals with the location of clocking stations and their accessibility to all the operators within the work shop. The cause of the problem might also be attributed to technical issues, such as drawbacks in the ERP system which allow clocking in to operations without previous operations being clocked out of. Finally, shop floor supervision involves the absence of a governing authority on the shop floor which is responsible for making sure operators constantly follow procedure. Furthermore, questionnaires were drafted and handed to Triumph Group, Inc. in order to distribute to operators as a means of identifying the root cause among the suggested causes. Unfortunately, due to time constraints and HR delays, the data from the questionnaires was not included in this analysis, and all the previously mentioned causes were treated as root causes.

Several possible solutions were outlined for the aforementioned causes. Solutions for operator behavior include the use of financial incentives to motivate operators to follow procedure, and the introduction of a sense of community within the shop floor culture. As far as the shop floor layout is concerned, the optimization of the location of clocking station locations was deemed as the most effective solution. Next, the incorporation of a Manufacturing Execution

System and RFID part tracking were both shown to be effective additions to the existing ERP system in order to facilitate information transmittal from the shop floor to upper management. Finally, giving operator supervisors more authority, in addition to conducting weekly reviews of clocking data were shown to be effective remedies to the absence of shop floor supervision.

Finally, given more time the root cause of the problem would have been identified based on the disseminated questionnaires. Furthermore, solution tracking and implementation would have offered deeper insight into the effectiveness of the chosen solutions. The creation of an algorithm using VBA in MS Excel that automatically identifies violations based on color-coding would have greatly facilitated the data analysis and reduction process.

In conclusion, several solutions were studied and outlined for the identified causes to the clock in and out problem. These solutions ranged from cultural changes to more technical and managerial adjustments to the shop floor.