Designing toshinba

Design

This paper examines the assembly line plan that Toshiba built for their new subcutaneous computer. It provided various assumptions made in order for Toshiba to achieve their goal of producing 300 new computers each shift using the existing production line and no Increasing overtime. It will examine the many variables and provide possible options for Toshiba Mazurka to change the current process.

Introduction The case study that I chose to analyze was Designing Toshiba Notebook Computer Assembly Line, for their new subcutaneous computer. Toshiba Mazurka is the manufacturing engineering section manager and Is looking to make the existing assembly line more efficient in order to handle the increased productivity while at the same time lower costs. The current assembly line equipment and space which already exist in the Toshiba plant, therefore the subcutaneous assembly process needs to adapt to the preexisting design. The current assembly line is a straight 14. Meter conveyor system which typically has 10 operators but can accommodate up to 12 workers; with all employees working for 7. 5 hours a day on the line. The amputees are assembled from Inventory provided by other employees and there Is no concern about the lack of supplies for the line. The subcutaneous computer will begin production quantities at 150 units per day and are set to increase to 250 in a week with an ultimate goal of 300 computers per day. The current process design makes it impossible to attain 300 computers in a 7. -hour shift using one line. A decision support model should be used to show an alternative option for how to solve this problem, using a given set of assumptions. Decisions/Assumptions A timeline of assembly concept Is needed to achieve a goal of reducing the maximum yes

time. A cycle time is the total time it takes to move a computer from beginning to the end of the physical process. The bottleneck position is where the employee's position meets with the maximum cycle time. As the number of employees changed the bottleneck position changed.

If there were multiple worker positions with the same bottleneck time, It would make it more critical that they all work within the time constraints. The goal of the case that presented a problem was to be able to produce 300 computers in a day with a 7. 5-hour workday. This means that Toshiba needs to produce at minimum 40 computers an hour or one every 90 seconds. This means a bottleneck time of 90 seconds or less is needed for all of the given operations to be established; otherwise the goal of producing 300 computers will not be met.

In the case that the assumptions are either impossible or not applicable, overtime work would be needed or additional assembly line for the subcutaneous day can be achieved, however management did not want to use overtime and the assumption is that only one line is to be used. The assumptions that were used are an important part of the case; they were either taken directly from the Toshiba case or interpreted. One assumption was that it was not physically possible to lengthen the line and therefore could not add more than the 12-employee maximum of the line.

Before making any major modification to the process, the assumption that individual operations could not be split from the engineers' plans, was used. Another assumption used was to only use the 7. 5-hour workday and one line of production, limited to 8 to 12 people, as stated in the problem. Since

Toshiba is making complex equipment, it's assumed that it's not possible not change the order of the operations itself but that there could be a station do varying combinations of operations.

Once the changes began, more assumptions were needed since it was realized that the first operation had to be able to divide into two parts, since the operation time was greater than the maximum cycle time required to produce 300 computers a shift. It was also assumed that with an upgrade, hardware testing software activity time could change to 50% of the original time. As well as the screwing operations could change to decrease the needed time; by changing the action to using plastic rivets.

Plastic rivets offer an important advantage over screws because they are easier to install and do not require the use off tool. The only disadvantage to their use is the needed removal and replacement of them if problems arise for consumers in the future. Since the assembly line is 14. 4 meters and separated into 1. 2-meter intervals, it can accommodate a maximum of 12 workers (14. 4/1. 2= 12). If less than 12 workers are utilized, then they should be bunched to the front of the conveyor system and empty spaces should be left at the end of the line.

Although this may cause a minimal increase in the delivery to the burn-in area by the final worker, the extra time is not a concern since the only time that the final station is a bottleneck location s when there are 12 workers on the line. In the ADSM, at first an upgrade to the software was done but found realized that more than 12 employees were needed to get the results. As given in the case, the production capacity for the assembly line as designed

according to the engineer's specified times is 236 computers in the 7. 5-hour working day.

Throughput time for this line structure according to engineering estimates is 17. 52 minutes (1051. 33 seconds). To begin the ADSM, a slight modification to the engineers' model using the assumption that it was possible to split operations teens any assemblywoman as long as they remained in the same order as prescribed. This increased the shift capacity to 245 computers, Just short of Theosophist's second goal of 250 computers. The numbers were derived by taking the bottleneck time of the operation, which was 114 seconds and divided the working day by it to achieve the amount of 236 computers that could be produced.

Efficiency as a production metric is a ratio of actual production divided by a standard measurement (Chase ; Jacobs, 2011). Efficiency was measured as the capacity per shift relative to the management goal of 250 computers per day. An efficiency rate of 100% would be a shift production of 250 machines. As the engineers laid out the assembly process, the efficiency of the line was 94. 4%. The maximum efficiency before made any major modifications was the 12-station model running at 108%. To (300/250). This is what is achievable with the design modifications using a 12-person line.

Another important relationship is between the idle time, standard deviation, and productivity. Although it may be important for management to attain a certain threshold of production, the efficiency must be considered as well. The idle time measurement is perhaps the most telling of the three. Analysis of idle time shows the large and significant variation that manifests as the

number of workers on the line changes. Utilizing 10 people on the line is the most efficient use of time as the engineers designed the process. A similar pattern will be seen if the assumptions are correct and the modifications to the whole process can be made.

The new optimal number of workers should be calculated if the modifications are made. Toshiba would need to consider many different factors when bringing the manufacturing line p to speed. One of the factors is employee selection. The ability to pick and hire new employees that have the same, or better, skill sets as the ones that are already working there is very important. There will also need to be back-up employees if one is sick otherwise kept from work, to prevent the line from not attaining their 300 computer goal.

Another factor is the facts that the plastic rivets should replace the screws in order to speed up production are not multiple-use items. They only work to hold together the item and do not allow for function again if they need to be removed or any reason at all, which may cause issues for the consumer. Regarding on how to ensure production stays within their specific time allotments while giving workers responsibility, a good pacing device for the line might be a system where each worker identifies when they have completed their specific task.

This can be tracked through a computer and then analyzed for correct assumptions about the process and workers can be moved so that the most efficient workers can be in the key bottleneck position. Conclusion In conclusion, based on the analysis of the proposed Toshiba assembly line

based on he engineering department's plans for its ability to produce a needed amount of units, it was found that the given plan was unable to produce at high enough rates.

There are a number of options that Toshiba has to attain the desired 300 computers per day goal and I believe that if the any of the assumptions that were mentioned are used they will be successful in their endeavor.