Capacity planning using linear programming

Business

Company R’s Strategic Capacity Planning Using Mixed Integer Linear Programming ABSTRACT Company R is experiencing 2. 07 more days in producing a certain line of hotdogs. Thus, incurring 51.

75% more cost of Php 5, 764. 62 per week. Through work sampling and time study, it was found out that the sealing section of the packaging line is the bottle neck activity with a standard processing time of 2. 86 min/kg. Additional machine is needed.

Employing strategic capacity planning through formulation of mixed integer linear programming model, to meet the annual demand, the resulting optimal machine combination was 3: Two single chamber floor model vacuum sealers and one double chamber floor model vacuum sealer. This gives the maximum net present value of Php 7, 636, 952. 36. By acquiring another machine with an output rate of 900 kg/hr, half of the time consumed is saved, cost is slashed by 50% and additional revenue of Php 335, 232. 00 is realized.

Huge and stable companies have seen the opportunities provided for by contracting and paying a third party to do the rudiments of their production.

This system is also known as toll manufacturing or toll processing. Toll manufacturing has been the new trend in production nowadays. It has opened the doors for small companies to process goods that are constantly in demand. On the other side of the fence, the companies who are being catered can save up millions in capital investments and are less worried with regard to varying production costs and so their turnarounds are quicker to realize.

Company R has spent a decade and has gained reputation in trading and manufacturing feeds in the agri-industry. Eight years ago, the company ventured to new heights by setting up a complete process chain from slaughtering, chilling, boning, and meat processing.

Since then, Company R has catered to big and reputable companies as toll manufacturer. Company R has recently entered a new project deal for toll processing with Company S, the country’s leading hotdog producer. While having several dry uns, the operations manager found out that the current production capacity will not be able to cope with the increasing monthly demand which are both from company S and their previous clients. There are lapses observed to be occurring in the packaging line. The line’s current output rate is 21 kg/hr as compared to the ideal 65 kg/hr.

This is the output rate that the company has set to fulfil its weekly demand. The company would like to know an initiative that would alleviate their present situation in order to respond and take advantage of their growing opportunities.

It was found out that the current efficiency, 40. 38%, of the packaging line was causing Company R 2. 07 more of the desired working days to produce an output of 87, 360 kg of a certain line of hotdogs per week, giving the company a 51. 75% additional labour and energy cost of Php 5, 764.

62 per week. III. RATI ONALE To accomplish is one thing but to finish efficiently is another. Company R might be fulfilling its client’s demand however since there are delays caused by inefficiency, there are more costs incurred.

In production, to be able to realize much income from the revenue earned, company R has to eliminate if not reduce their extra expenses. Though improving the assembly line might cause substantial initial cash outflow, this study is essential for the company to know which among the initiatives is the most conservative that would benefit them in the long run.

IV. OBJECTIVES The goal is to reduce the number of days utilized in packaging a certain line of hotdog from 6. 7 days to only 4 while meeting the weekly demand and completely eliminate if not reduce the additional labour and energy cost being incurred due to inefficiency using Strategic Capacity Planning. It is a system approach that aims to match its long-term supply capabilities and the predicted level of long-term demand. Also, one of the intentions of this study is to increase the opportunity of processing more hotdog lines in the amount of time that is intended to be saved from the strategy.