

Investment alternatives and operational changes in the production of perforating punches

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ABSTRACT

The report identifies and investigates possible investment alternatives and operational improvements to the production of perforating punches. The analysis is conducted for a leading Swedish manufacturer in the industry. First, an analysis of the company and its customers is performed, followed by a study of the current production capabilities. Based on this investigation, key investments opportunities are identified and analyzed. Finally, possible managerial and operational changes are addressed and discussed.

The findings highlight the link between investments and operational management, and how they are interdependent. Specifically, the report identifies the importance of lead times in this industry, and proceeds to propose both investments and managerial changes which would improve these lead times. A total of four investments are analyzed, which significantly impact lead times, product quality, production capacity and production cost. Three of these investments are found to be advisable, whilst one requires further investigations. Finally, changes to corporate management and operations management are discussed. The proposed changes include an increase in production volume, the implementation of the 5S methodology and the strategic change of focusing on increased sales volumes.

1 INTRODUCTION

The market for industrial goods is getting evermore international, subjecting suppliers to increased levels of competition. For production facilities located in the western hemisphere, this generally implies competition with low-cost alternatives. As a result, manufacturers often need to cut costs and/or focus on the quality of the products and services in order to remain attractive on the market[1]. Investments in new production methods and technology is often necessary but is generally costly and require integration with existing equipment.

The report[2] on which this summary is based, investigates the current production capabilities of Gerdins Cutting Technology AB (Gerdins), a leading supplier of cutting dies and perforating punches (punches) in the Nordic region. The company has a long history of producing tools for the shoe-manufacturing and printing industries and have a strong customer focus. At Gerdins, quality, lead times and flexibility are regarded as very important in relation to the customers.

The purpose of the report is to investigate the current production in the punches department and identify both possible investment alternatives and possible operational changes. This is done with the purpose of optimizing the process in relation to production cost, lead times and quality. Furthermore, an analysis of the proposed investments is performed. The report focuses on investments deemed interesting for the company and answers the following research questions:

- Which investment alternatives are worth considering?
- Which effect will these investments have on production cost, product quality and lead times?
- Which investment alternatives are advisable for the company?
- Which changes to corporate and operations management are advisable?

2 METHODOLOGY

A variety of sources are used, including the corporate Enterprise Resource Planning (ERP)-system, interviews with all related personnel and measurements performed by the author. The collected data is then analyzed using different models, including an Activity Based Costing (ABC)-model[3] for the calculation of production cost. The steps of the method used are shown below. The calculations and analyses in their entirety are the product of the author.

1. General analysis of the company with the purpose of identifying and quantifying core customer needs and return demands on bound capital.
2. A detailed analysis of production costs and lead times for representative products.

3. Identifying possible investment alternatives and operational changes based on the previous analysis.
4. Evaluating investment alternatives.
5. Reflecting on the interdependence of proposed investments and operational changes.

3 RESULTS AND DISCUSSION

3.1 GENERAL RESULTS

Customer demands on punches vary between product segments and between individual customers. For products targeting the shoe manufacturing industry (the leather segment), the competition is largely based on the product unit price. Meanwhile, for products targeting the printing and packaging industries (the graphic segment), other factors, such as the lead time, are of importance. The report finds that the average customer is willing to accept a maximum time from order placement to order shipment, of 5 workdays. Further, it is found that Gerdins fulfills this customer demand for 35-30% of the orders, if orders modified by the customer are included. If modified orders are excluded from the statistic, the delivery reliability is improved.

3.2 COST REDUCTION

Based on demands posted by the customers and stockholders, a number of operational and managerial changes are identified and discussed. For some product dimensions in the leather segment, it was found that the production cost could be decreased by 77-78%. This is achieved by increasing the machine utilization and batch sizes. Based on this finding, the author recommends that sales volumes be increased, even at expense of the average sales price. The marginal production cost consists largely of material costs, which at present constitute about 15% of the production cost. Furthermore, the risk of products becoming obsolete is negligible and the production currently has overcapacity. Therefore, the author recommends that a push-production[4] be adopted, rather than producing against order. This significantly reduces the production cost and reduces customer delivery times as it implies larger stock values. It is advised that any over-production shall be sold on new markets at reduced prices. As such, new markets are made available to the company and the risk of reduced sales margins on current markets is kept low. Offers received by the company indicates that it is possible to sell sufficient volumes, at profitable prices, on new markets.

Furthermore, it is found that the investment in a new production machine could reduce production costs for the remaining product groups of the leather segment, mainly by reducing the need for manual labor. The new production machine proposed also implies a significant simplification of the production process as it allows for the removal of several production steps and machine groups. A feasibility study conducted by the author, using approximated values, shows an expected Internal Rate of the Return (IRR) of 28.7% and an expected payback time of 3.6 years, significantly better than the returns demanded by stockholders. It is therefore advised that a further analysis be conducted with regards to a new production machine. Finally, the investment in a production machine accessory[5] is advised as its usage would significantly reduce the production cost and increase production capacity.

3.3 LEAD TIME

The report concludes that the lead time can mainly be improved in two ways. Firstly, by increasing stock levels, the probability that an order may be sent directly from storage, increases. Furthermore, the cost of bound capital[6] increase induced, is not significant, in relation reductions in production cost and improved delivery time.

Secondly, an investment in a hardening furnace is proposed and investigated. It is found that this investment leads to a significant production lead time reduction, from 11.3 days to 3.5 days, for the cases investigated. This production lead time reduction is of importance to delivery times, since it is not deemed possible for the company to have all of its approximately 3000 products in stock. It would also allow for the company to regain control over this crucial production step, and thereby the product quality. The report finds that an investment of up to 1 750 000 SEK can be accepted by the company, provided its return demands.

4 CONCLUSION

The report identifies and investigates investment alternatives and operational changes to the production of punches. The company is advised to invest in a hardening furnace and production machine accessory. The investment in a new production machine is also identified as a promising investment, but requires further analysis.

Furthermore, the company is advised to increase stock volumes and implement push-production. Additional investments and operational changes are advised in the full report[2].

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