

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**APPLICATION OF LINEAR PROGRAMMING TO OPTIMIZE
PROFIT OF SME PRODUCTS**

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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ABSTRACT

Planning in production is frequently challenging for small and medium-sized enterprises (SMEs). Most SMEs struggle to determine the optimal level of production output, which can have a negative impact on their business's performance. Numerous businesses have utilized linear programming models to determine the optimal combination of various products to produce to maximize profits. Thus, this study aims to maximize the profits of an SME company in Malaysia using a linear programming model as well as to optimize the production planning of a company by using the linear programming method that will suggest a viable product mix to ensure optimal profit for the company. One of the SME companies in Malaysia was selected as the case study company for this study. Various conclusive observations and recommendations have been made. This study benefits the exposure of Malaysian SME owners to linear programming methods in decision-making to determine maximum profitability for different product mixes. In addition, this study also benefits the field of mathematics because linear programming helps in converting verbal descriptions & numerical data into mathematical expressions and helps in achieving optimal productive use of resources. Based on the solution from Microsoft Excel Solver, which gives an optimal solution of $X_1 = 60$, $X_2 = 0$, $X_3 = 5$ and $Z = 236$. Thus, the SME company is suggested to produce 60 units of Kerepek Pagoda 200g and 5 units of Kerepek Pagoda 5kg to obtain the maximum profit of RM236.00 per day. Sensitivity analysis was carried out to reach a valid conclusion. Finally, this study proves the ability of linear programming to optimize production planning as the company manages to obtain a maximum profit of RM236.00 per day, which is an increase of 20.90% over the current profit.