Volume 2, Issue 1

Innovation Series Quarterly

https://journal.academicapress.org/aps/index.php/isq

Research Article

Semi-Automatic Traditional Malay Kuih Machine

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Keywords:

Design
Machine
Fabricate
Traditional Kuih
SolidWorks

Abstract: *This project addresses the problem of slow and tiring manual production of traditional Malay kuih during the Hari Raya festive season, especially when demand is high. The methodology involves designing a semi-automatic kuih machine using SolidWorks and fabricating it with a stainless-steel frame, a motorized pressing system, and traditional molds. The findings show that the machine can produce kuih faster with more consistent shape and quality. The project concludes that the proposed machine effectively supports home bakers and small businesses while preserving traditional kuih designs.*

1. INTRODUCTION

Many people are involved in making traditional Malay kuih for household consumption and small-scale businesses. However, traditional kuih making requires significant manual work, time, and physical effort, making the process tiring and inefficient, especially for large-scale production. This can affect consistency in shape, size, and quality (Kamaruzaman et al., 2023).

Currently, most traditional kuih are made manually using basic tools and hand techniques. Although this method preserves tradition, it is time-consuming and highly dependent on individual skill. Prolonged manual work can also cause fatigue, reduce productivity, and limit daily production, which may affect income and business growth for small entrepreneurs (Mat Tahir et al., 2022).

To overcome these problems a semi-automatic traditional Malay kuih machine is proposed to assist the kuih-making process. This machine reduces manual effort while maintaining traditional characteristics, improving efficiency, consistency, and production speed (Kamarul et al., 2020). It is designed to be user-friendly, compact, and suitable for small-scale use, allowing users to produce kuih with less physical strain. The aim of this project is to design and improve the machine using SolidWorks, focusing on functionality, ergonomics, and practicality to support individuals, communities, and the preservation of traditional food culture (Othman et al., 2025).

2. LITERATURE REVIEW

Efficient food molding systems are important in improving production consistency and reducing manual labor in food processing industries (Malik et al., 2023). Accurate control of mold movement and shaping mechanisms helps ensure uniform product size and quality Previous patented designs emphasize the use of automated or semi-automated molding systems to enhance operational efficiency and reliability in food production processes(van den Berg et al., 2013).

Several patents also highlight the importance of mechanical simplicity and controlled motion to reduce wear and extend machine lifespan (Kumar et al., 2021). These design principles are relevant to the development of a semi-automatic traditional Malay kuih machine, as they support efficient shaping while remaining adaptable to small-scale applications.

3. METHODOLOGY

The process design of design and fabrication of the product were done according to the process flow shown in Figure 1. The design and analysis were conducted using SolidWorks.

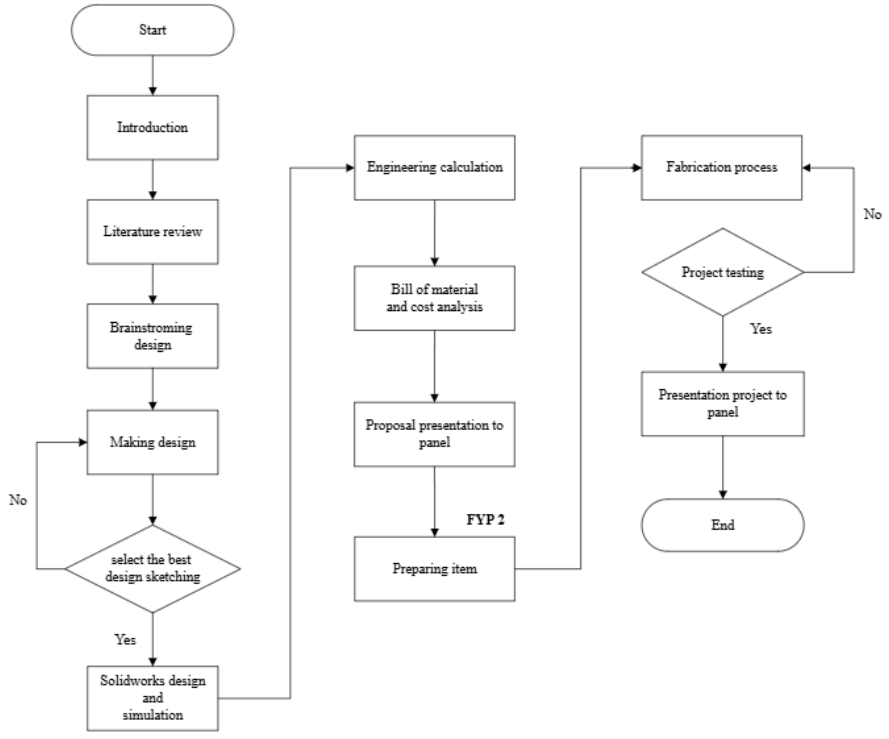


Figure 1. Process flow of the design and fabrication

The fabrication process involves designing the product and choosing suitable raw materials (Bouwman & Bateman, 2015). The materials are then cut and shaped using simple processes such as cutting, grinding, and welding. After that, all parts are joined and assembled to form the final product.

In this project, basic fabrication methods were used to build the machine. Safety precautions were also followed during the process, such as wearing a safety jacket and safety boots to prevent accidents.

4. FINDINGS

4.1 Design of the Semi-Automatic Traditional Malay Kuih Machine

SolidWorks is a useful design tool used in the early stage of product development (Miguel et al., 2013). In this project, SolidWorks was used to design a semi-automatic traditional Malay kuih machine. The design process began with hand sketches on paper. Three design sketches were produced, as shown in Figure 2, Figure 3, and Figure 4. After comparison, Figure 4 was chosen because it best meets the design requirements and machine function. The selected sketch was then redrawn and improved using SolidWorks. The design results are shown in Figure 5 and Figure 6. Figure 5 shows the exploded view, which displays all parts separately. Figure 6 shows the full assembly view of the machine. The prototype was fabricated based on this design to ensure correct size, shape, and proper assembly.

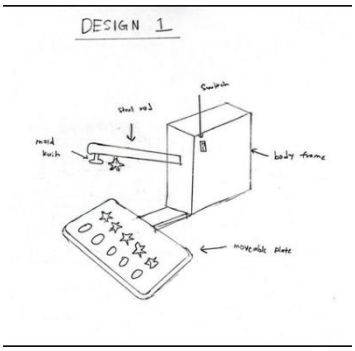


Figure 2. Design 1

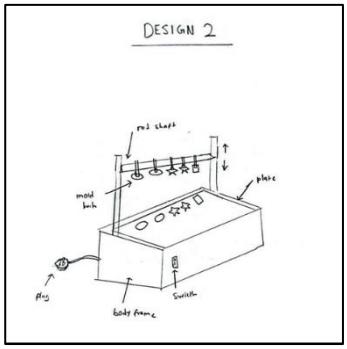


Figure 3. Design 2

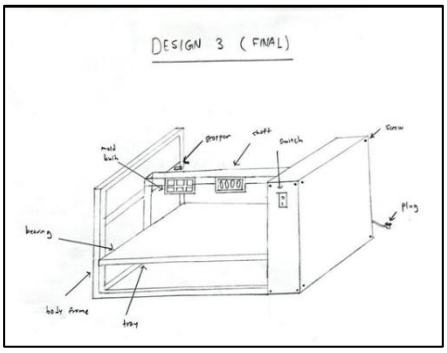


Figure 4. Design3

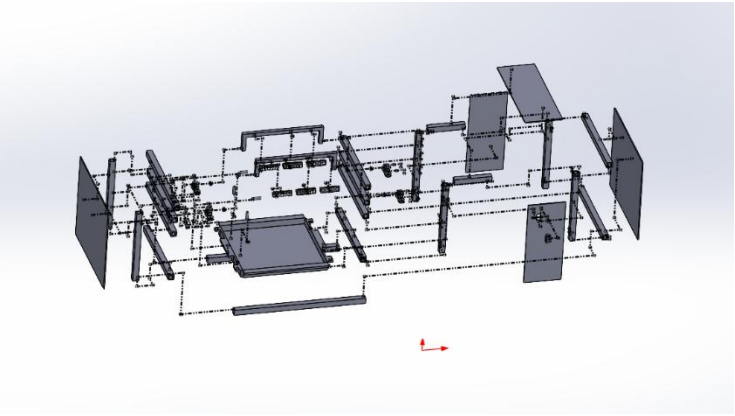


Figure 5. Exploded View Semi-Automatic Traditional Malay Kuih Machine

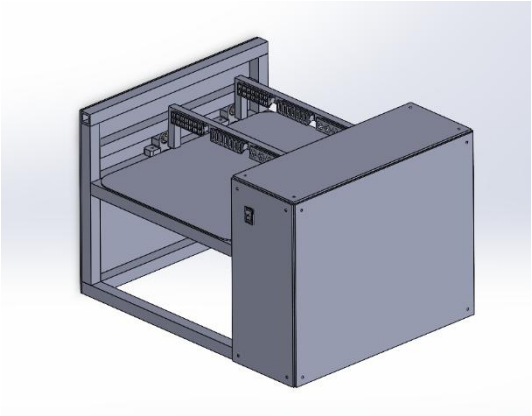
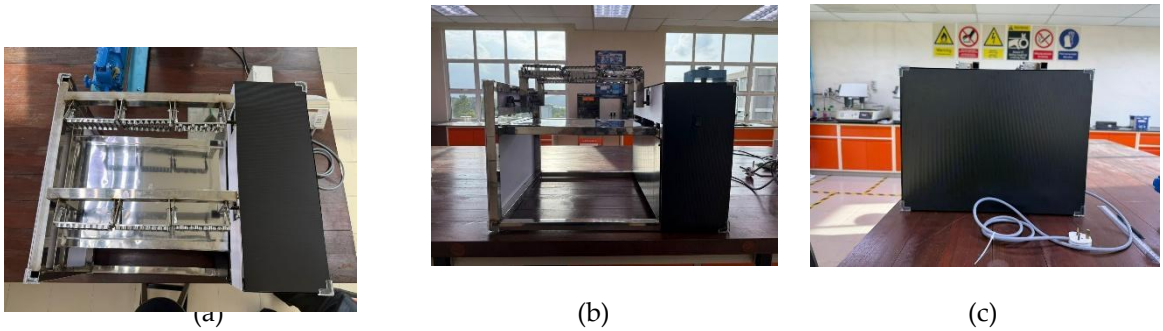


Figure 6. Assembly drawing of the Semi-Automatic Machine

4.1.2 Final Fabricated Prototype

The final fabricated prototype was successfully completed, as shown in Figure 7. The prototype was made based on the SolidWorks design. All dimensions follow the planned size with a tolerance of 1-1.5 mm. The machine frame uses stainless steel because it is strong, does not rust easily, and is suitable

for food use. This helps make the machine more durable and safer for long-term use (Zaffora et al., 2021).



(a) (b) (c)

Figure 7. (a) Top view, (b) front view and (c) side view of the completed prototype

4.1.3 Product Testing

The semi-automatic traditional Malay kuih machine was tested to make sure it works well and to fix any problems. A power window motor was used to move the kuih mold up and down. By pressing the up and down switches, the motor moves the mold to press the dough into the right shape. Figure 7 shows how the pressing works. When the down button is pressed, the mold goes down to the dough tray. When the up button is pressed, the mold moves up and goes back to its original place.

Figure 8. Product testing the machine is push down to the tray

5. DISCUSSION

Table 1 shows the discussion final product specifications of the semi-automatic traditional Malay kuih machine. It includes information about the material used, dimensions, power source, weight, and the machine's capabilities.

Table 1. Final Product Specification

Types	Specification
Material	Stainless Steel
Dimension	L(700) *W (500) *H(300)
Power Source	Power Window Motor
Maximum Pressure Input	12V
Minimum Pressure Input	0V

Weight	15-20 kg
Product Capability	Can press 60-90 per hour

6. CONCLUSION

In conclusion, the objectives of designing and fabricating a semi-automatic traditional Malay kuih machine have been successfully achieved. The issues related to slow production rate, inconsistent kuih shape, and high manual effort in traditional kuih making have been addressed through the development of this machine. The effectiveness of the proposed machine is demonstrated by its ability to assist the molding process, improve consistency, and reduce operator fatigue, while still maintaining the traditional characteristics of Malay kuih production (Kamarul et al., 2020).

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