DESIGN OF A CURRY PUFF MAKING MACHINE

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DEDICATION

To my beloved mother and father, my wife and my sons

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ABSTRACT

Most of the processes of curry puff making in small scale industry are well known as handmade product where curry puffs are made by using human manpower completely. This certainly needs many human power and skilled operators to increase their production rate at high competitive level. In another side, experienced curry puff maker use the machine that imported from out of our country. This can be a burden for small scale industry player that want to start and continue their small business.

This project is to design a curry puff making machine that will help industry player to start their business at low cost. To realize the model of the machine, a systematic approach called product design and development is implemented to ensure the proper design is completed. It is covers the concept development, concept scoring, selection and preliminary final design. Consequently a conceptual model of curry puff machine complete is created. For further step, this conceptual model will be designed in detail and model analysis will be performed to distinguish any design related issues.

Curry puff making model is function semi-automatically where it is used to form and crimp the curry puff according to its mould shape. This machine consisting 8 units of plastic mould that capable of producing 8 pieces of curry puff in each operation and would be increased if required. It is use controlled mechanical power to ensure systematic operation is performed. At the same time, the material that used for machine structures are selected based on safety concern for food processing equipment.

ABSTRAK

Kebanyakan proses pembuatan karipap dalam industri berkala kecil lebih menjurus kepada produk pembuatan tangan di mana karipap dibuat dengan menggunakan tenaga manusia sepenuhnya. Ini sudah tentu memerlukan tenaga manusia yang ramai serta berpengalaman untuk meningkatkan kadar penghasilan produk di peringkat berdaya saing. Di satu bahagian yang lain, pengusaha yang berpengalaman menggunakan mesin pembuat karipap yang diimport dari luar negara di mana kebergantungan kepada mesin luar adalah tinggi. Ini membebankan bagi pengusaha industri berskala kecil ini yang memulakan dan menjalankan perniagaan mereka secara kecil-kecilan.

Projek ini merekabentuk mesin pembuat karipap yang bakal membantu pengusaha memulakan perniagaan pada kos yang rendah. Dalam merealisasikan rekabentuk model mesin tersebut, kaedah merekabentuk yang sistematik dipanggil pembangunan dan rekabentuk produk diserapkan bagi memastikan sebuah rekabentuk yang tersusun dipatuhi. Ini merangkumi pembangunan konsep, penilaian, pemilihan konsep, dan permulaan kepada rekabentuk akhir.

Model mesin pembuat karipap yang direkabentuk ini berfungsi secara semiautomatik di mana ia digunakan untuk melipat dan membentuk karipap mengikut acuannya. Mesin ini mengandungi 8 unit acuan plastik yang mampu menghasilkan 8 biji karipap pada setiap operasi malah boleh ditambah jika perlu. Ia menggunakan tenaga mekanikal secara terkawal bagi memastikan perjalanan operasi tersusun. Penggunaan bahan untuk membina struktur mesin dititikberatkan kepada bahan yang diklasifikasikan selamat bagi pembuatan bahan makanan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ABS	Acrylonitrile butadiene styrene
BOM	Bill of material
FEA	Finite Element Analysis
PDS	Product Design Specification
PBT	Polybutylene Terephthalate
SMI	Small and medium industry

LIST OF APPENDICES

CHAPTER 1

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

The industry of frozen food is believed to have high chances of expansion especially in the export market. Every time and everywhere, locally, we saw curry puff is sold from food stalls near the main road until the big shopping complex. Therefore it is not to surprise if this curry puff making industry was selected by most local entrepreneurs with good understanding its potential to be commercialized so that it can getting into the local and foreign markets massively.

Curry puff cake is traditionally made manually. Most of the manufacturers (in SMI) are also producing the curry puff manually with extra workers. Manual production refers to the process of folding or crimping dough into curry puff shape. They use variety of machines to prepare the raw materials until up to preparing the dough sheets. From business point of view, this is time consuming therefore becomes the bottleneck in responds to the market demands. Besides the manual production, this traditional process requiring numerous skilled workers that contributes to the high labour cost.

This project is to design a model of curry puff making machine with the intention, eventually to develop and assist SMI manufacturers to solve the time and skill constraints.

1.2 PRODUCT DESCRIPTION

This project is focusing on the design of curry puff making machine, in particular the automatic crimping mould assembly.

Developing a great product is hard. Few companies are highly successfully more than half the time of their product development. Successful companies in the business world constantly operate in a state of innovation in terms of products they manufacture, frequently introducing new products or modifying and improving existing products as needed and desired by the customers. This project report consists of methods for completing the product development activities. The applied methods, which are well-structured, provide a step-by-step approach and templates for the key information systems used by the most organization team. Based on these methodologies, there are three advantages expected. Firstly, the decision processes is completely made, allowing everyone in the team to understand the decision rationale and reducing the possibility of moving forward with unsupported decisions. Secondly, by acting as "checklist" of the key steps in a development activity it is ensure that the important issues are not forgotten. Third, these structured methods are largely self-documenting; in the process of executing the method, the team creates a record of the decision-making process for future reference and for educating newcomers.

1.3 PRODUCT OBJECTIVE

To produce a detailed product design specifications of a curry puff making machine capable of performing dough sheet stamping and crimping processes.

1.4 PROBLEM STATEMENT

Figure 1.1 shown is the overview of curry puff making process which was identified as problem statement of this project. This manual method shows how the processing steps which is time consuming thus making curry puff production is not competitive enough in term of business. This project intends to solve the problem of crimping method where the manual crimping technique is not suitable for large quantity production.

1.5 SCOPE OF WORK

1. Identify the manual methods of producing curry puff and analyze the possibility for production improvement using a machine.
2. Product design and development technique is implemented.
3. Design a few concepts of curry puff making machine and perform the best design selection.
4. Design a curry puff machine in 3D models.
5. Special focus on the crimping process in which a detailed product's design specification (PDS) will be developed.

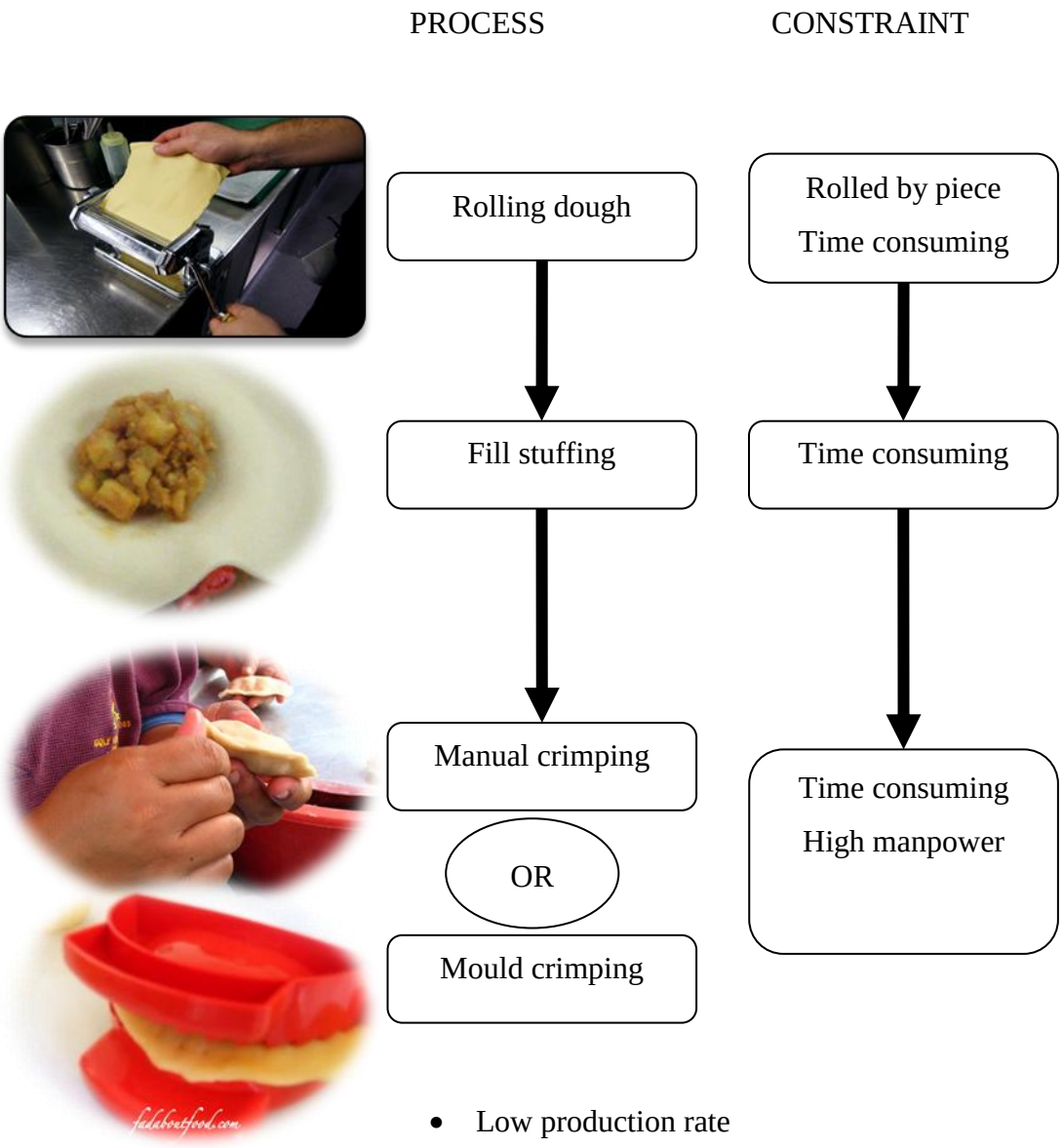

Figure 1.1 Overview of a typical curry puff making process