A STRUCTURAL APPROACH TO THE PRODUCT MANAGEMENT

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Abstract. Designing a product means to apply scientific knowledge to the solution of technical problems and then to optimize that solution within the given material, technological and economic contraints. In this paper are presented some important aspects of product management as the problem of establishing the function structure of a product.

Key words: marketing mix, product, design, function structure,overall function, sub – function, logical function, AND – function, OR – function, NOT – function, NOR – function, NAND – function.

1. INTRODUCTION

The decisions in marketing mix have in view:
-the product (P):
- -the function characteristics;
- -the quality;
- -the guarantees;
- -the packing;
- -the service attached to the product;

-the price (P):
- -the price list;
- -the discounts;
- -the way to grant credits;
- -the conditions to pay;

-the promotion (P):
- -promotion:
- -the publicity;
- -the personal sale;
- -the public relations;

the placement (P):
- -the channels of placement;
- -the points of despatching
- -the means of transport;
- -the level of stocks.

The product, from the point of view of marketing, is an physical object, a service or an idea that can induce a demand into the market.The ingineering of value, named, also, the analyse of value, has at the base a list of functions / advantages of the product (table 1).

The list of functions of a product . Table 1.

Functions	Main	Secondary	Objectives	Subjective	Necessary	Useless
Function 1						
Function 2						

In this paper is presented the way of establishing the function structure of a product.

2. THE FUNCTIONAL INTERRELATIONSHIP

When solving a technical problem is necessary a system with a clear and easily reproduced relationship between inputs and outputs. Also, between the beginning and the end of a process there must be a clear and reproducible relationship. To describe design problems, it is useful to apply the term of "function" to the general input/output relationship of a system.

For static processes it is enough to determine the inputs and outputs, while for dynamic processes, the task must be defined further by a description of the initial and final magnitudes. The function becomes an abstract formulation of the task, independent of any particular solution. If the inputs and the outputs of all quantities involved are known, then it is possible to specify the "overall function". An overall function can often be divided directly into identifiable "sub – functions" corresponding to sub – tasks. An example of function structure for the packing of carpet squares is given in figure 1.

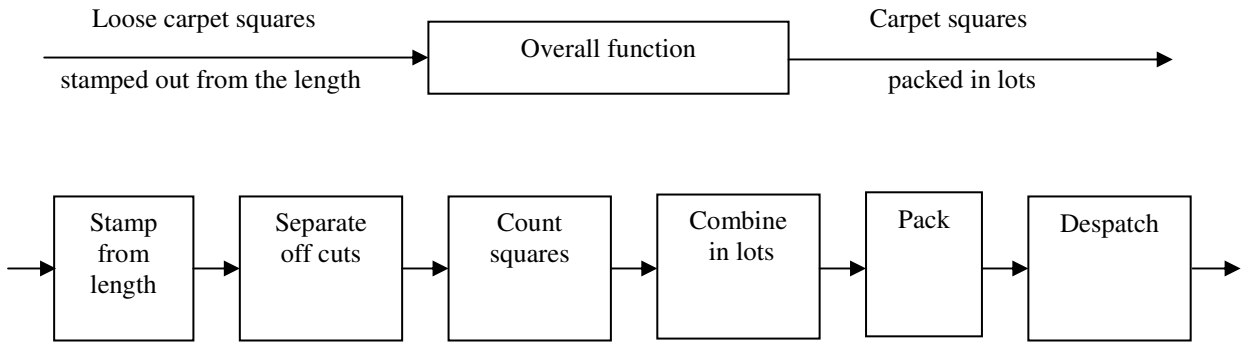


Fig. 1
The function structure for the packing of carpet squares

The sub – functions are represented in rectangles. At the structure given in fig. 1 can be added auxiliary functions resulting the structure from the fig.2.

A function is, also, defined as activities, effects, goals and contraints. In mathematics, a function is a association of a magnitude y with a magnitude x (single – valued function) or more than one value (multi - valued function). It is possible to classify functions so that the lowest level of the function structure consists of functions that cannot be sub – divided further while remaining applicable.

The sub – functions are replaced with more concrete statements: physical, chemical or biological effects.
The function is satisfied by the application of the solution principle, which is realized by the arrangement of surfaces and the choice of motions. The surface is determined by:
-type;
-shape;
-position;
-size;
-number.
The motion is determined by:

-type;
-nature;
-direction;
-magnitude;
-number.

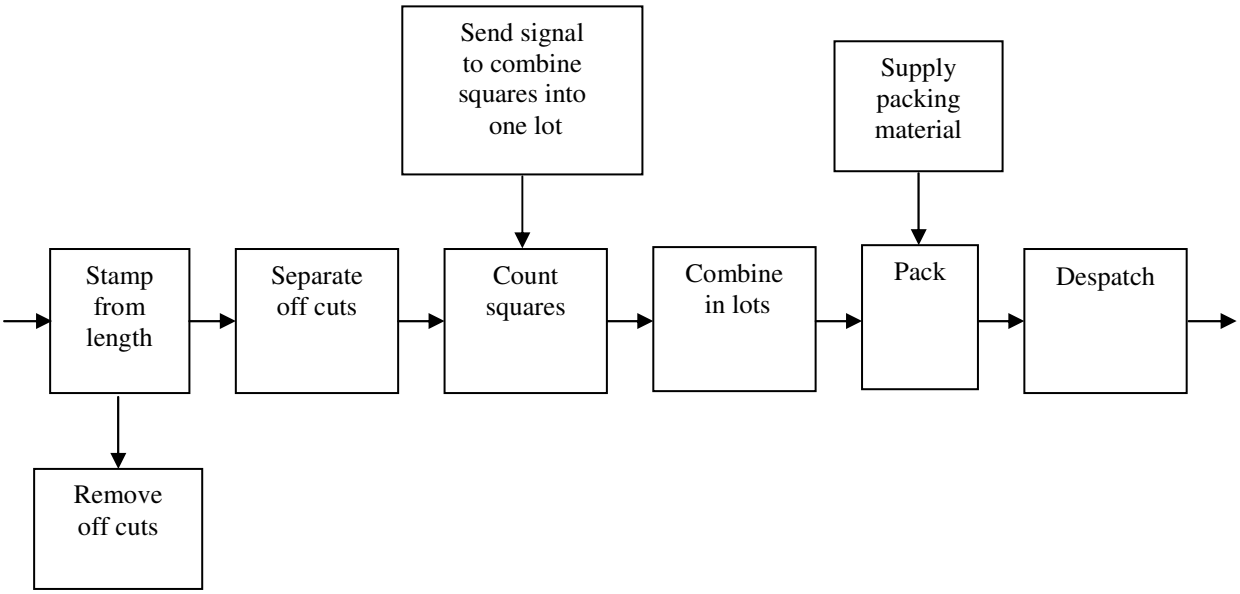
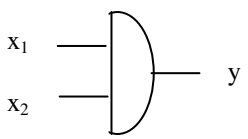
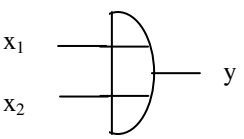
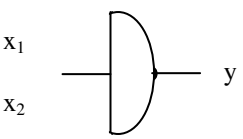


Fig. 2. The function structure with auxiliary functions for the packing of carpet squares

Certain sub – functions must be satisfied before another sub – functions. So called "if – then" relationship helps to clarify as for example: if the sub – function A is present, then the sub – function B can come into effect. Logical relationships must be established between inputs and outputs. In many cases the problem can be treated in two – valued logic, for example: true / untrue, in / out, fulfilled / not fulfilled, present / not present. In the case of AND – function, all signals on the input side must have the same validity if the a valid signal is to appear on the output side. In the case of OR – function, only one signal in the input side must be valid if a valid signal is to appear on the output side.

In the case of NOT – function, the signal in the input side is negated, so that the negated signal is to appear on the output side. There are, also, complex functions: NOR – function (OR with NOT) and NAND – function (AND with NOT). All these logical functions can expressed by standard symbols. The logical validity of any signal can be readfrom the truth table in which a,l imputs are combined systematically. The Boolean equations are added for completeness.
The logical functions are presented in table 2.

Logical functions. Table 2.

Designation	AND – function	OR – function	NOT - function
Symbol			

Truth table	x_1 0 1 0 1 x_2 0 0 1 1 y 0 0 0 1	x_1 0 1 0 1 x_2 0 0 1 1 y 0 1 1 1	x 0 1 y 1 0
Boolean algebra	$y = x_2 \wedge x_1$	$y = x_1 \vee x_2$	$y = \overline{x}$

3. CONCLUSIONS

In fulfilling the marketing mix it is very important to find the solution to obtain a new and competitive product.
The analyze of the product making its logical structure it is very helpful.
Logical relationships are derived from the corresponding requirements of the problem.
It is helpful to inquire into the logical contents by the mean of "if – then" propositions.
The clarification of the logical relationships facilitates the search for solutions.
It is necessary to determine whether the logical contents can be satisfied by logical functions with AND, OR and NOT relationships.
The logical structures may be optimized with the help of Boolean algebra.

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