

## APPLICATION OF ABC ANALYSIS TO THE COMPANY'S PRODUCTION PROGRAM: A CASE STUDY

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### Abstract

In this research paper, the topic of the production program will be discussed and the representatives of the production program will be presented, which were obtained on the basis of the ABC analysis, as well as the basic characteristics of the production company "Jugoplast", the way of organization of the company as a system, production and production program, respectively product specifications by types and quantities with their sales prices for the period from 2021 to 2023. In the paper, a comparison of several similar companies was made and it was determined that this company achieves better results by applying ABC analysis. A structural analysis of the most important products was performed and the phase of the production life cycle of the most important product was presented according to the criterion of the relative production volume.

**Keywords:** production program, representative, ABC analysis, competitors.

### INTRODUCTION

In order for a company to be competitive, it is necessary to constantly listen to the needs of end users. Listening to the needs of the end consumers is achieved by analyzing the market and applying various methods and tools, in order to understand the wishes of the customers and create a product according to those wishes, that is, provide a service. The result of the market research for the company represents the way in which it will achieve a better position in relation to its competitors. Bearing in mind that the market is the place where supply and demand meet, the company should get answers to the following questions through research:

- What are the needs of end consumers?
- What is the target group of customers, respectively who are the customers of products and/or services?
- Where does the business system stand in relation to competitors?

- What to do in order to improve the market position of the company?

Production is a purposeful activity in which a certain set of resources - inputs, is transformed into certain output products that serve to satisfy human needs [1].

### COMPANY'S PRODUCTION PROGRAM

The production program of the Serbian company "Jugoplast" includes products such as moldings and profiles, pipes and hoses and electrodes.

Serbian company "Jugoplast" in Guca was founded in 1996 and deals with the production of various materials in construction, but primarily aluminum and plastic. The main production of this company is the extrusion of polymer chloride products. These products are mainly used as auxiliary products in construction. In addition to polymer chlorides, products are made from aluminum and galvanized sheet. The main

activity of the company "Jugoplast" is the production of products that will be used as a substitute for products imported from the European Union. In addition to our country, products are exported to countries in the region: Macedonia, Albania, Montenegro, Bosnia and Herzegovina and Croatia, where about 30% of the products are exported. In addition to the basic products in the production program, Jugoplast produces different products according to the customer's sample or technical documentation. Guided by the principle that: "Only a perfect product is a good product", the company has modern equipment and professionally trained staff in order to offer the best quality products to the market.

In the Table 1 is presented the basic production program, and Table 2 shows the supplementary production program of the company "Jugoplast".

Table 1. Basic production program of the company "Jugoplast" [2]

Ordinal number	Product name
1.	Moldings and profiles
2.	Moldings and profiles for
3.	Angle for machine plastering 0.5
4.	Angle for machine plastering 0.4
5.	Slat profile with DLT
6.	Finishing moldings in construction
7.	Finishing moldings for ceramic
8.	Finishing moldings for ceramic
9.	Finishing moldings for ceramic
10.	Universal molding 10 mm
11.	PE spacer for ceramic tiles 2 mm
12.	PE spacer for ceramic tiles 3 mm
13.	Moldings for the system of thermal insulation facades
14.	PVC corner molding with glass
15.	JPL 8+12
16.	JPL 10+15
17.	JPL – V 10+15
18.	S 8+12
19.	S 10+15
20.	S – V 8+12
21.	S – V 10+15

Ordinal number	Product name
22.	B 8+12
23.	PVC drip tray with glass mesh
24.	Slatted PVC profile (APU) with
25.	PE tipl 100 mm JPL
26.	PE tipl 100 mm R
27.	PE tipl 140 mm
28.	PE tipl 160 mm
29.	AL initial profile 50/2000
30.	AL initial profile 80/2000
31.	AL initial profile 100/2000
32.	AL corner profile 20x20x2500
33.	PVC mounting profile for gypsum
34.	L corner profile for palletizing
35.	L-shaped profile for palletizing
36.	L corner profile for palletizing

Table 2. Supplementary production program of the company "Jugoplast" [2]

Ordinal number	Product name
1.	Pipes and hoses
2.	Greenhouse pipes
3.	Flushing pipe for cisterns
4.	Hoses for vacuum cleaners
5.	Riser pipes for fire extinguishers
6.	Fire nozzle handle cover
7.	Garden hose
8.	"Thomas" hose
9.	Electrodes
10.	Electrodes for welding plastic

### ABC ANALYSIS

ABC analysis is a method used to analyze and manage products. This method aims to divide the products into group A, B or C, depending on the share in the total value of the product. They make up about 70%, 25% and 5% of the total value. Products from group A make up the largest share in the total value, therefore they require more frequent and rigorous control, as it is a question of this type of control, it is desirable for these products to have very good conditions of storage and preservation of the product. What is important for products from this group is to save large quantities that are in stock, that is, to take care that the stock is consumed (delivered). Products from group B require slightly less control and an intermediate classification, i.e. the average

of products from groups A and C. It is important for these products to be monitored, in order to determine if at some point they can change the category, i.e. move to product group A. Products from group C require the least control. These products are in very little demand on the market, so it is not necessary to keep large stocks of these products, it is best to have one type of product from group C, because after each purchase there will be a shortage of stock and an increased risk of excessive inventory costs (Figure 1).

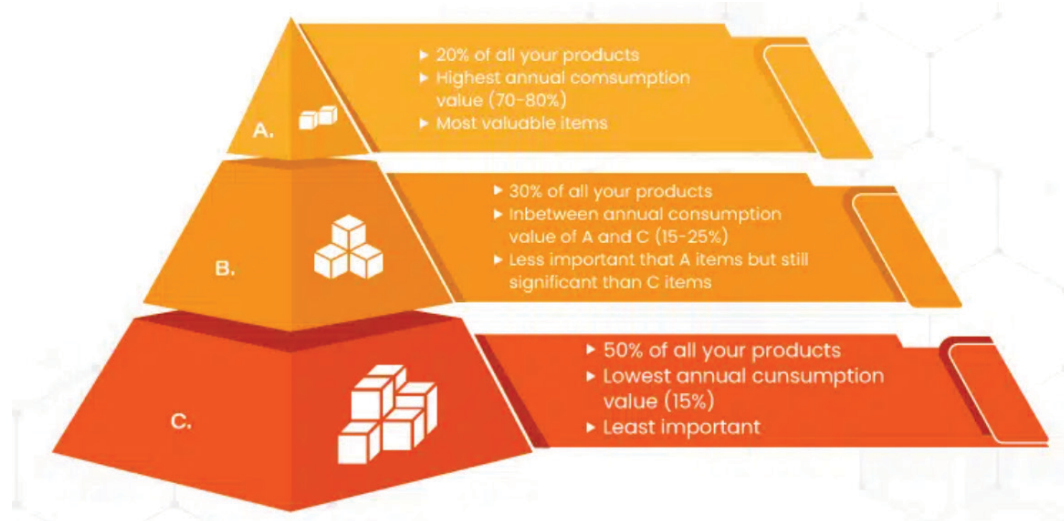


Fig. 1. Presentation of ABC analysis in production systems [4]

These are the following products: End moldings for ceramic tiles 10 mm, angle for machine plastering 0.5 mm, slatted PVC profile with mesh, PVC drip tray with glass mesh, L corner profile for palletizing, end moldings for ceramic tiles 8 mm and slatted profile with DLT.

On the basis of the performed "ABC" analysis according to the criterion of absolute volume of production, it can be concluded that the representative of the production program is the product of the final Molding for ceramic tiles 10mm, which accounts for 23.36% of the total revenue for the observed period.

Group "B" consists of 10 products such as: angle for machine plastering 0.4 mm, universal molding 10 mm, PE dowel 100 mm, PE spacer for ceramic tiles 2 mm, PE dowel for ceramic tiles 3 mm, finishing moldings for ceramic tiles 12 mm.

Group "C" consists of 9 products, namely aluminum starting and corner profiles, L corner profile for palletizing crates, dowels of various types and dimensions.

Computed (calculated) ABC analysis delivers a precise mathematical calculation of the limits for the ABC classes [3].

In Table 3, an ABC analysis was performed according to the criterion of absolute volume of production. According to this criterion, the representative of the production program is the product that has the largest share in the realized sales revenue in the observed period. Table 3 shows the analysis according to the mentioned criteria.

In Table 3, we can see that group "A" consists of 8 products with a share in the total revenue of 78.50% for the observed period.

The figure 2 shows a graphic representation of the production program of the company "Jugoplast" based on the criteria of absolute participation in the total volume of production.

Table 3. ABC analysis according to the criterion of the absolute volume of production of the company "Jugoplast"

Product name	Total annual income	Share in total revenue	Cum. part.	Product group for "ABC"
Finishing moldings for ceramic tiles 10 mm	15099760	23.36%	23.36%	A
S 8+12	9232335	14.28%	37.64%	
Angle for machine plastering 0.5 mm	7512583	11.62%	49.26%	
Slatted PVC profile (APU) with mesh	6515166.5	10.07%	59.34%	
PVC drip tray with glass mesh	4084780	6.31%	65.66%	
L corner profile for palletizing	3768030	5.82%	71.49%	
Finishing moldings for ceramic tiles 8 mm	2500870	3.86%	75.36%	
Slat profile with DLT	2032413.3	3.14%	78.50%	

Product name	Total annual income	Share in total revenue	Cum. part.	Product group for „ABC“
Angle for machine plastering 0.4 mm	1889571.3	2.92%	81.43%	B
Universal molding 10 mm	1874664	2.90%	84.33%	
B 8+12	1423800	2.20%	86.53%	
PE tipl 100 mm JPL	970050	1.50%	88.03%	
PE spacer for ceramic tiles 2 mm	963300	1.49%	89.52%	
PE tipl 140 mm	940712.5	1.45%	90.98%	
S 10+15	920000	1.42%	92.40%	
JPL 8+12	828000	1.28%	93.68%	
PE spacer for ceramic tiles 3 mm	735480	1.13%	94.82%	
Finishing moldings for ceramic tiles 12 mm	633920	0.98%	95.80%	
AL initial profile 50/2000	593186	0.91%	96.72%	C
L-shaped profile for palletizing crates	497002	0.76%	97.49%	
AL corner profile 20x20x2500	478000	0.73%	98.23%	
AL initial profile 80/2000	426900	0.66%	98.89%	
PE tipl 100 mm R	272700	0.42%	99.31%	
JPL – V 10+15	160000	0.24%	99.56%	
PE tipl 160 mm	152500	0.23%	99.79%	
JPL 10+15	84525	0.13%	99.92%	
S – V 8+12	36000	0.05%	99.98%	
AL initial profile 100/2000	11000	0.01%	100%	

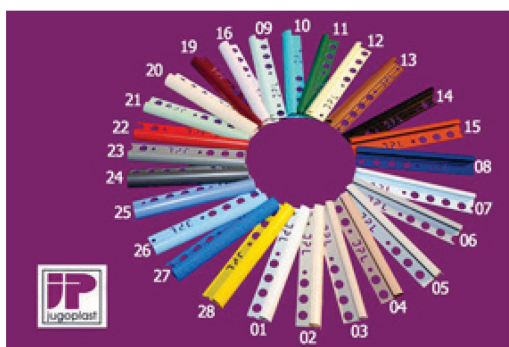


Fig. 2 Finishing moldings for ceramic tiles 10mm [5]

## FEATURES OF THE REPRESENTATIVE PRODUCT

Based on the "ABC" analysis of the absolute and relative volume of production, it can be concluded that the representative of the

production program of the company "Jugoplast" for 2015 is the product of the finishing molding for ceramic tiles 10 mm, with a share in the total revenue of 23.36% and a share in the total volume of production 18.65%. We can conclude that finishing moldings in construction are the best-selling product because they are made in a wide range of colors and offer a great possibility of pairing with the design of ceramic tiles, which results in an aesthetic appearance, and therefore they are the most sought after on the market (Figure 2).

End moldings in construction are used to join vertical and horizontal edges when installing ceramic tiles and are very practical to use. Moldings are made in several different colors, which makes it easier to match colors with ceramic tiles.

## COMPETITORS OF THE REPRESENTATIVE'S PRODUCTS

Table 4 shows the names of the competitors of the company "Jugoplast" Guča with ratings given based on four criteria such as quality, price, availability and marketing activities. Also, it is presented lists of four companies that are competitors of the company "Jugoplast" Guča. The biggest competitors of this company are the company "Nip - Spasić" with a high rating of the representatives production program quality. A price is not acceptable for all users, as well as marketing activities, while the product is available at all points of sale.

The company "Dominium" has the highest rating in terms of quality and this company is the biggest competitor of the company "Jugoplast" when it comes to product quality. Also, the price is acceptable for almost all users. The product has good marketing, so customers can almost always be informed about the details of the product.

Table 4. Evaluation of product competition of representatives of the production program of the company "Jugoplast"

Company name	Quality	Price	Availability	Marketing activities
Nip – Spasić	4	3	4	3
„Dominium“ – d.o.o	5	4	3	4
„Stil – lux“ – d.o.o	2	3	2	4
„Алу - dekor“	4	2	4	3
„Jugoplast“ - Guča	4	4	3	4

When it comes to the company "Stil-lux", it can be seen that this company represents the smallest competition to the product representative of the production program of the company "Jugoplast". Products have a low price for quality and availability.

The company "Alu-dekor" can be seen to have a high rating in terms of products and availability, but when it comes to the price, it can be said that it is high, while the marketing activities are rated medium and need a little more work.

Picture 3 graphically shows the evaluation of the product competition of representatives of the production program of the company "Jugoplast".

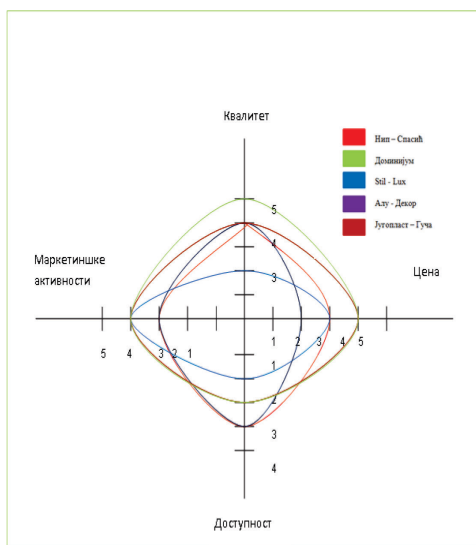


Fig. 3 Graphic representation of the evaluation of the product competition of representatives of the production program of the company "Jugoplast" Guča

The product representative of the production program compared to the competition has a satisfactory price, availability and quality, while marketing activities must be increased. A business can improve its website by regularly updating its website and making data fully accessible to users in various other ways.

### STRUCTURAL ANALYSIS OF THE MOST IMPORTANT PRODUCTS

A structural analysis of the company's production program is presented based on breadth, length, depth and consistency. The product range is a collection of all product lines that a particular manufacturer offers to customers for sale.

**Product breadth** refers to the number of different product lines that a company produces. The company "Jugoplast" produces three product lines such as moldings and profiles, pipes and hoses and electrodes.

**Product capacity** represents the total number of items in the company's product range or the total number of individual products in the production line. Thus, in the production line of moldings and profiles there are 15 types of products, in the production line of pipes and hoses there are 7 types of products. In the production line of electrodes there is 1 type of electrodes.

**The depth** of the assortment represents the number of variants that each individual item in the product line has the following types: PVC finishing molding for ceramic tiles, PVC universal molding for the inner corner of tiles, PVC corner molding to protect the edge of the wall, PVC corner profile with glass mesh, corner for machine plastering 0.5 and 0.4 mm, slatted PVC profile with mesh, L corner profile.

**Consistency** refers to the connection of various product lines. So, all the mentioned products are related to finishing works in construction and are used during the construction of buildings.

Production includes the entirety of economic life, all its basic segments: production, exchange and consumption, and not only the work process in which the objective consumption of subjective and material factors of production is directly and simultaneously carried out [6].

The ABC analysis provides a mechanism for identifying items that will have a significant impact on overall inventory cost [7].

### THE LIFE CYCLE PHASES OF PRODUCT ACCORDING TO THE CRITERION OF PRODUCTION CAPACITY

Based on the ABC analysis of the production program of the company "Jugoplast" based on relative criteria, 8 products were classified into group "A". Figure 4 shows the life cycle of products from group "A" according to percentage participation in the total volume of production, finishing moldings for 10 mm ceramic tiles.

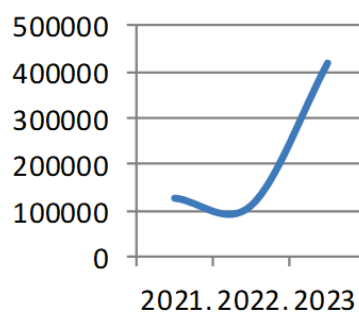


Fig. 4 Life cycle of the product "Finishing moldings for ceramic tiles 10 mm"



The sales decline phase is the phase in which sales show a strong downward trend, resulting in a decline in profits. Declining sales can occur for several reasons: such as technical advantages, changes in consumer tastes, and increased competition [8].

## CONCLUSION

The most significant aspect of any product program is its life cycle phases, starting from the idea, through the introduction phase, growth phase, maturity phase, and decline phase. The initial phase, i.e. the idea phase, should not be rushed, but be fully convinced that the new product will really experience success on the market, because the failure of the product can be very expensive. Likewise, a product cannot stay on the market forever and generate good income during its stay on the market. Every product, if it experiences success, must also experience a fall. For this reason, it is necessary to make innovation on existing products in various ways in order to keep them on the market as long as possible, as in the case of the company "Jugoplast". Thus, it will perform even more successfully both on the domestic market in the region and in the countries of the European Union. All this is achieved by constantly innovating existing products and introducing new ones, improving marketing activities and providing information available to users at all times.

Based on everything highlighted in the paper, it can be concluded that production is the most important function of a company, because all other activities of that company depend on it. The paper analyzed the production program of the company, processed the representative of the production program "Finishing skirting boards for ceramic tiles 10 mm" based on the ABC method, according to the absolute and relative criteria of the volume of production. The characteristics of the representative of the production program, the stages within the life cycle of the representative of the production program, competition, as well as a structural analysis are the most important to gain excellent production program. It can be concluded that the company "Jugoplast" successfully faces changes in the environment and improves the growth of its products, those products that gradually grew on the market experience a sudden increase, while products that were in a slight decline, by

improving their characteristics, gradually move into the growth phase.

Regardless of the type of production, every company must focus on the quality of its products and the satisfaction of consumer needs because this represents the long-term strategy of every company. It is also very important to adapt to new changes both in the internal and external environment, and to be able to manage them. Without change management, the effective functioning and development of every organization and every enterprise, every individual social system and society as a whole cannot be achieved.

The tradition of product quality, good business results, productivity growth, innovations, investments, appreciation of business partners and clients, environmental awareness, concern for environmental protection are the results of the company "Jugoplast" receiving a regional award (BUSINESS PARTNER 2014) in a long tradition of 20 years.

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