

The role of value engineering technology in reducing costs and improving product value: An applied study in the General Company for Textile Industries (men's clothing factory in Najaf Al-Ashraf)

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Abstract : The study aimed to clarify the cognitive foundations of value engineering technology and to demonstrate the role that technology can play in reducing costs and improving the value of the product in a way that makes the product of the economic unit (men's clothing factory in Najaf) at the level of competitive products.

In the theoretical aspect, the researcher relied on the data and information available in dissertations, research, and on the Internet, while the applied aspect was through cost data for the research sample (Men's Clothing Factory in Najaf Al-Ashraf) for the year 2022.

The researcher reached a set of conclusions, the most important of which was that value engineering technology provides solutions to many of the problems facing the economic unit, and aims to optimize the exploitation of economic resources, improve performance and product quality, and reduce costs to achieve competitive advantage.

The researcher recommends a set of recommendations, the most important of which is that the economic unit, the research sample, should constantly communicate with customers to find out information about their desires and requirements regarding the characteristics of the products that meet these desires and requirements and conduct periodic studies and research on the market, to produce products that achieve customer satisfaction and then their loyalty. The economic unit, the research sample, is clearly interested in value engineering technology through the formation of a work team, because of its role in reducing costs and improving the product's value.

Introduction: The contemporary business environment has witnessed rapid developments represented by competition, technological development, globalization of markets, increasing intensity of competition, reliance on information, and focus on the customer, resulting in changes and fluctuations in customers' tastes and their need for products with low prices, functional performance, and high quality that meet their requirements. Given these developments, there was difficulty facing economic units in applying the traditionally recognized systems and approaches to cost accounting, as these systems and approaches do not provide appropriate information, so it was natural for modern techniques to be searched in the field of cost accounting in response to the above developments, so it appeared. The need for the emergence of value engineering technology as one of the most prominent technologies to keep pace with scientific progress and changes in the business environment to achieve the main goal that economic units seek, which is to meet the requirements and desires of customers by reducing the cost and improving the value of the product through dividing the product into functions and components and studying and analyzing them.

Chapter One: Research Methodology

Research problem

The problem of the research revolves around the fact that the Iraqi economic units suffer from a rise in production costs compared to foreign competing products offered in the market. The Iraqi economic units also suffer from a decrease in the value of their products from the point of view of the economic unit and the customer. Despite the presence of these problems, the economic units do not use technologies. Contemporary administrative and cost-effectiveness, and on this basis the research problem can be formulated with the following question:

- 1- Is it possible to apply value engineering (VE) technology in the research sample factory (men's clothing factory) in a way that contributes to reducing costs and improving the value of the product in a way that is appropriate for the Iraqi workers' environment?

research importance

The importance of the research lies in the importance of value engineering technology and its suitability for environmental changes, which generated challenging factors and pressure on the future of economic units and created justifications for the emergence of this technology, and because of its role in helping economic units in reducing costs and improving the value of the product by identifying unnecessary jobs that do not add value. Value from the point of view of the economic unit and the customer, and work to exclude it.

research aims

The research objectives can be formulated as follows:

A- Discussing the cognitive foundations of value engineering (VE) technology.

B - Explaining the role that value engineering technology can play in reducing costs and improving the value of the product in a way that makes the product of the economic unit (men's ready-made clothing factory in Najaf Al-Ashraf) at the level of competitive products.

C- Using value engineering technology by dividing the product into functions and components and workers to exclude or improve functions or components that do not add value and thus raise the functional merit of the product.

Research hypothesis

The research is based on the following hypothesis:

(The use of technology and value engineering can contribute to helping the economic unit, and the research sample, reduce costs and improve the value of the product in a way that is compatible with the requirements of the modern worker environment).

The research sample

The research will be conducted in the General Company for Textile Industries (Men's Clothing Factory in Najaf Al-Ashraf) as one of the formations of the Ministry of Industry and Minerals, due to the importance of the company and its production of products related to the lives of citizens, in addition to the possibility of applying value engineering technology, as well as the need for the research sample to use such For its role in reducing costs and improving the value of the product, the research will be conducted on the financial and cost data for the research sample for the year 2022.

The second chapter: The theoretical introduction to the value engineering technique in reducing costs and improving the value of the product**First - the concept of value engineering**

There are a set of concepts for the value engineering technique presented by a group of researchers, and these concepts can be clarified through the table as follows:

Table (1)
Concepts of value engineering technology according to the opinions of some researchers

Sequence	Source	The concept of value engineering
1	Rane,2016:1410	Value engineering is an organized and analytical process that seeks to achieve value for money by providing all necessary functions at the lowest cost consistent with the required levels of quality and performance.
2	Arivazhagan,at el) (2017:65	Value engineering is defined as a function-oriented technique that focuses on improving the design of the product at the lowest cost. It is one of the tools that works to identify and eliminate non-crisis and unnecessary costs in the various stages of production.
3	(Elamir,2017:46)	Value engineering is defined as a systematic approach to identifying and eliminating unnecessary costs that prompt a complete analysis of the use of a service or product rather than just engineering features. It is not cost reduction, quantity reduction, cheaper materials, or lower standards, nor is it quality control or design review. It is a job analysis that adds cost without contributing to the desired functionality.
4	J V , 2019:76	Value engineering technology is a technique directed at analyzing the functions of an item or process to determine (the best value). In other words, the best value is represented by an item or process that consistently performs the basic required function and has the lowest cost for the life cycle of the product or service.

Source: Prepared by the researcher based on the sources indicated for each concept

From what has been presented, it can be said that value engineering technology is an organized effort directed towards analyzing the components and functions of the product to reduce costs and improve the value of the product by re-evaluating the various components and functions to help economic units exclude those that do not host value from them from the point of view of the unit and the customer and improve the components and functions. Others to achieve a competitive advantage for the economic unit.

Second: Objectives of value engineering technology

There are many goals accompanying the application of value engineering technology, through which economic units seek to reduce costs and improve the value of the product. (Jassem, Othman, 5: 2017)

1- Improving functional performance and quality by increasing the functionality of the product (the level of performance of the product for the customer) and the materials are constant (raw materials, human materials, time and

price), or reducing materials while the function remains constant, or by reducing materials and increasing function at the same time.

2- Value engineering technology aims to improve efficiency and search for the best balance between function, cost, reliability, quality and performance of the product or service.

Third - Steps to apply the value engineering technique

The value engineering technique has steps that are implemented to remain a distinct technique that relies on practical practices more than theory, which are as follows:

1- Information stage: In this stage, project information is collected, and reviewed, and details are studied among the team, with questions such as “What is it?” The answer is, "What does it do? What does it cost?" It is necessary to obtain the correct information from this stage, otherwise the alternatives developed later will not achieve the required functions adequately (Elamir, 2017: 48).

2- Functional analysis stage: This stage is related to identifying the most useful areas for study. This stage is considered the spirit of the value engineering technique because it involves revisiting the previous component to ensure the value of the function. A value engineering technology business plan aims to remove unnecessary functionality that increases cost and provide an alternative, cheaper way to perform the functionality without sacrificing the value that customers will derive. This phase challenges the VE team to relate their functional outcomes to the product hardware in order to properly plan redesign recommendations. (Elamir, 2017: 48))

3- Creativity stage: This stage requires a degree of creative thinking by the team. This stage focuses on developing alternative, more cost-effective methods to achieve the basic function. All stages of brainstorming are permissible, and criticism must be avoided at this stage because it can stop the flow of ideas, and all that must be done at this stage is to collect ideas. (Elamir, 2017: 48)

4- Evaluation stage: During the previous stage, commenting on or judging the ideas presented was not allowed, because the goal was to present ideas, and then choose the most appropriate ones that conform to the criteria that were previously determined. The evaluation process takes place in two stages.

A- Classification of alternative ideas

B - Choosing the right ideas. (Sorour, 2021: 211).

5- Development stage: The goal of this stage is to choose the appropriate alternative and plan it to improve the value. In order for the owner and designer to make an initial assessment of feasibility, the information prepared by the team for each of the alternatives must include some technical, expense, and schedule data.

6- Presentation phase: The goal of this phase is to achieve dedication and competitiveness from the project sponsor and planner and to further integrate the recommendations. The proposal phase actually presents the best alternative(s) to those who have the authority to implement the accepted proposed solutions. Preparing the value engineering technique involves a proposal (VEP) that contains the information necessary to reach a decision and implement the proposal. (Sharma, 34: 2021)

7- Implementation and follow-up stage: During the implementation and follow-up step, the administration must ensure that the approved recommendations are converted into procedures. Until this is done, no savings will be made to offset the cost of tuition. (Elamir, 2017: 48)

Fourth - the concept of cost reduction

A group of concepts can be reviewed to reduce costs, as follows:

Table (2)
Cost reduction concepts

Sequence	Source	Cost reduction concepts
1	(Al-Zamili, 2017: 87)	Cost reduction is a group of activities and operations carried out by the economic unit, with the aim of making the costs of its operations, products and services at the lowest possible cost, without having a negative impact on both functional performance and quality of the product, so that it can meet the requirements And customer needs, thus helping the economic unit achieve competitive advantage
2	(Abdullah, Falih, 2018: 87)	The concept of cost reduction means that reducing costs is to achieve real and continuous savings in the unit cost of the manufactured product or service provided without affecting its suitability for the required use, through the use of a set of activities and processes that contribute to reducing the cost without affecting the efficiency or quality of the product or service.
3	(Bello, 2020: 80)	Reducing costs is an organized, deliberate and strategic effort to reduce the unnecessary use of materials that can improve the efficiency of the operating operations of the economic unit, and that reducing costs is the most important goal that the economic unit seeks to ensure continuity.

Source: The researcher repeated, relying on the indicated sources for each concept

Fifth. Principles of cost reduction

In order for the cost reduction process to be carried out effectively and in a successful manner, the following principles must be taken into account. (Ali et al., 2018: 63)

- 1- Focus on the cost elements that can afford the greatest reduction in costs with the least effort compared to other cost elements.
- 2- The analysis and study of costs and the application of proposals should not be at a cost greater than the reduction in costs.
- 3- Reducing costs does not lead to a reduction in the quality of products, which would affect total revenues.
- 4- That reducing costs does not lead to making wrong strategic decisions, such as dispensing with a fixed asset that the economic unit may need in the near future.
- 5- Reducing costs should not affect or weaken the morale of workers, which would affect productivity.

Sixth - improving the value of the product

The changes occurring in the current market world, especially the differences in the high cost of the product and customer preferences, have led economic units to face intense competition, forcing the units to manufacture and provide products that guarantee their sustainability in the business environment and gain a competitive advantage, in that their production meets the requirements and desires of customers. It means improving the value of the product. (Al-Kinani, 2021: 69)

And the value of the product is based on two elements, which are as follows: (Dawood & Abdul Razzaq, 124: 2009)

- 1- The functional benefits of the product: It includes functional performance, which is the purpose for which the product is made, quality, and quality means the amount of fulfilment of the special desires of the beneficiary and includes durability and overall values.
- 2- Total cost: It is the amount of money, effort and time spent on the product.

This means that increasing functional performance, improving quality, and reducing cost leads to obtaining the highest value for the product according to the following equation:

Value measure = job benefits ÷ total cost.

Job benefits = job performance + quality

Seventh - The role of value engineering technology in reducing costs and improving product value

Reducing costs using value engineering technology is done by eliminating wasteful applications and practices, and this happens in several areas, including: (Kazim, 2008: 130)

- 1- Substitution of materials: Sometimes unnecessary or ineffective inputs are replaced with materials that perform the same function at a lower cost.
- 2- Efficiency and productivity of the process: The reduction is achieved through the use of the most efficient process and the process of designing the product is redesigned so that it is easier to produce, and working to eliminate unnecessary costs and parts, as this process of exclusion results in an overflow of costs in the production process.
- 3- Conversion and change: that is, developing sub-production processes and reusing many products that were meagre or weak to reduce costs, such as manufacturing decorative tape for a specific product instead of purchasing it.
- 4- Market-oriented product improvements: A product that has more features or features than what the customer wants. This is undesirable because customers will pay for features or features that they do not want.

It also contributes to reducing costs by adopting the principle of optimal cost versus functionality, which is the contemporary concept of reducing costs, which represents what value engineering technology adopts. According to this concept, the cost of item (A) is reduced with the necessity of maintaining and improving the quality of basic functions, and this is done by Developing the item into another item (B) is an advanced model of the first model that has lower costs than the first and better performance and quality. In light of this concept, work must be done to identify and exclude unnecessary costs associated with the components and functions of the product that do not add value when developing the current product until it is transformed into a product. New is the highest value from the point of view of the economic unit and the customer (Al-Zamili, 105: 2017)

The third chapter: the application of value engineering technology in the men's clothing factory in Najaf

First - an overview of the men's clothing factory in Najaf

The ready-made men's clothing factory is one of the formations of the General Company for Textile and Leather Industries, one of the formations of the Ministry of Industry and Minerals. The factory was established in July 1985 under the name of the ready-made men's clothing factory / Najaf Al-Ashraf. It began experimental production in 1987, and commercial production began in 1988. The factory worked For more than 30 years in the production of ready-to-wear clothing, it sought to meet the clothing needs of citizens with modern and diverse models and designs that keep pace with international fashion with high-quality types to gain customer satisfaction and approval at competitive

prices. There are many products produced by the factory, such as (men's suits, military suits, and suits) Work and military vests....etc.)

Second - Applying value engineering technology in the factory

The value engineering technique will be applied to the military park through three agency stages:

The first stage: previous studies of the value

This stage consists of three agency steps:

1- Product selection: According to this step and through the field presence of the researcher, the military park product that is the subject of the study was chosen because it belongs to a large segment of society in addition to the high demand for it.

2- Choose a multi-functional work team: Under this step, a work team was chosen from various specializations (research and development, design, procurement, production, cost), the accounts manager, the production department official, the technology division official, and the cost official, and even though the use of technology Value engineering has no features in the economic unit (research sample). The work team was cooperative and willing to work with the researcher to achieve the research objectives.

3- Determining the end date of the study: The study period was determined to be less than one year through the period of the researcher's presence to use the technology in the research sample unit.

The second stage: value study:

This stage consists of six consecutive stages, as follows:

1- Information stage: After the product has been identified in the previous stage, and the work team has been chosen, in this stage the largest number of information related to the military park product is collected, where information is collected from inside and outside the economic unit, as for the information collected from within the unit Economic, it is information from the Costs Division related to detailed information about the military unit. As for the information related to the design, the parts involved in production, and the distribution of operations to produce the product, it is obtained from the Design Division, and the information that was obtained from outside the economic unit is information related to suppliers. Raw materials and other information.

2- Functional analysis stage: This stage is the spirit of the value engineering technique. Through this stage, a value index is made for each part of the military park to identify and diagnose the parts that will be subject to the procedures of the value engineering technique. This stage consists of three agency steps:

A - Determining the relative importance of the parts of the military park: This step is applied through the use of QFD, which is an auxiliary tool for the value engineering technique, and it is applied through the following:

A-1- Determining customer requirements: In this step, customer requirements are determined, and this was done through the researcher conducting interviews with Mr. Sales Manager, the sales official in the showroom affiliated with the men's ready-to-wear factory, as well as some customers. (9) requirements were identified. The basics are: (fabric durability, colour fastness, resistance to weather conditions, size, aesthetics, health aspect, price, flow, and ease of cleaning)

A-2- Determining the relative importance of customers' requirements: Determining the relative importance of customers' requirements is done by relying on the questionnaire form distributed to a group of employees based on the Curt scale to calculate the total number of frequencies of the sample.

Paragraph	Grade or weight
very important	5
Important	4
somewhat	3
not important	2
Not very important	1

Table (3) shows the contents of the questionnaire.

Table (3)
Empty the contents of the questionnaire

Customer requirements	very important 5	Important 4	somewhat 3	not important 2	Not very important 1
Fabric durability	24	4	2	-	-
Colourfastness	18	10	2	-	-
Resistance to external conditions	21	8	1	-	-
Measurement	21	6	3	-	-
Aesthetic	13	10	5	1	1

Health aspect	18	6	5	1	-
the price	19	5	4	1	1
Streamline	12	9	6	3	-
Easy to clean	14	7	6	2	1

Source: prepared by the researcher based on the results of the questionnaire

After filling out the questionnaire in Table (3), the relative importance of customer requirements is then determined according to the following table:

Schedule (4)

The weighted sum and relative importance of each of the customer's requirements for the blessing

Customer requirements	very important 5	Important 4	somewhat 3	not important 2	Not very important 1	Weighted sum	Relative importance
Fabric durability	120 ¹	16	6	0	0	142 ²	12.04% ³
Colourfastness	90	40	6	0	0	136	11.54%
Resistance to external conditions	105	32	3	0	0	140	11.87%
Measurement	105	24	9	0	0	138	11.71%
Aesthetic	65	40	15	2	1	123	10.43%
Health aspect	90	24	15	2	0	129	10.94%
the price	95	20	12	2	1	130	11.03%
Streamline	60	36	18	6	0	120	10.18%
Easy to clean	70	28	18	4	1	121	10.26%
the total						1179	100%

Source: Prepared by the researcher based on Table (3)

From the above table, it is clear to the researcher that some customers' requirements are more important than others, due to the relative weight of these requirements from the customers' point of view. Fabric, weather resistance came second with a rate of 11.87%, because military park users need this feature because of the diversity of their places of residence and working conditions.

A-3- Determining the technical requirements (voice of the engineer): The technical requirements for the military bark product were determined through researcher interviews that were conducted with the official of the sewing department. layer, buttons, magic tape, tag)

A-4- Determining the relationship matrix: After defining the requirements of customers and the components of the product, it is now possible to determine the relationship between them through the use of the relationship matrix, and the relationship matrix also contributes to determining the percentage of the contribution of each component of the product to achieving the customer's requirements.

the weight	code
5 = strong relationship	Θ
3 = moderate relationship	O
1 = weak relationship	Δ
0 = no relationship	

Table (5)

Matrix of the relationship between customer requirements and product components

Product Components	fabric	scalp	clouds	Cotton	Layered	buttons	Magic Tape	sign
Requirements								
Fabric durability	Θ	O	O	O	O	O	O	O
Colourfastness	Θ	O						
Resistance to external conditions	Θ	Θ	Δ	Δ		Δ		

$$120 = 5 \times 24^1$$

$$142 = 6 + 16 + 120^2$$

$$12.04\% = 1179 \div 142^3$$

Measurement	O	O	O	O	O	O	O	O
Aesthetic	Θ	Δ	Δ	Δ	O	Θ		O
Health aspect	Θ	Θ						
the price	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
Streamline	Θ	O						Δ
Easy to clean	Θ	O						Δ

Source: Prepared by the researcher based on the director of quality, the director of the quality control department, and the official of the Designs Division.

Table (5) shows the relationship between each component of the military park product in meeting the requirements of the product on the basis of the opinions of specialists. It was agreed to define the relationship (correlation) between each of the components of the product and the requirements of customers, while giving weights to express the relationship. We find, for example, the relationship between cloth The military and the requirement for the durability of the cloth, the stability of colours, the resistance to external conditions, the aesthetic, the health aspect, the smoothness of the cloth, and the ease of cleaning are a strong relationship, and the relationship between the fur, the durability of the cloth, and the stability of colours is a medium relationship, and so on for the rest of the components and their connection to the requirements of customers.

The relative importance of the components of the military blessing can be clarified through Table (6), as follows:

Schedule (6)

The relative importance of the components of the military park

Product components requirements	Fabric	scalp	clouds	Cotton	Layered	buttons	Magic Tape	sign	The relative importance of customer requirements
Fabric durability	0.6020 ⁴	0.3612	0.3612	0.3612	0.3612	0.3612	0.3612	0.3612	12.04%
Color fastness	0.5770	0.3462	0	0	0	0	0	0	11.54%
Resistance to external conditions	0.5935	0.5935	0.1187	0.1187	0	0.1187	0	0	11.87%
Measurement	0.3513	0.3513	0.3513	0.3513	0.3513	0.3513	0.3513	0.3513	11.71%
Aesthetic	0.5215	0.1043	0.1043	0.1043	0.3129	0.5215	0	0.3129	10.43%
Health aspect	0.5470	0.5470	0	0	0	0	0	0	10.94%
the price	0.5515	0.5515	0.5515	0.5515	0.5515	0.5515	0.5515	0.5515	11.03%
Streamline	0.5090	0.3054	0	0	0	0	0	0.1018	10.18%
Easy to clean	0.5130	0.3078	0	0	0	0	0	0.1026	10.26%
The total	4.7658	3.4682	1.4870	1.4872	1.5769	1.9042	1.2640	1.7813	17.7346
The relative importance of product components	26.87% ⁵	19.56%	8.38%	8.39%	8.89%	10.74%	7.13%	10.04%	100%

Source: prepared by the researcher based on Tables (5) and (4).

From the table above, the interpretation of the relationship between the components of the product and the requirements of customers is shown in the form of a percentage of multiplying the relative importance of each requirement in Table (4) by the contribution of each component to achieving the customer's requirements in Table (5). The purpose of this process is to work on improving the components of the product Through the relative importance of customer requirements.

B- Determine the functions of the product:

At this stage, the components and functions of the military park are determined, as shown in Table (7).

Table (7)

Al Baraka product is divided into components and functions

the components	Jobs
Fabric	It is the outer layer and consists of 35 % polyester and 65 % cotton
scalp	It is the inner part (layer) and it works as a lining for the pool that protects it from weather factors
clouds	It is used for the purpose of closing pockets and closing military patches
Cotton	It is used for the purpose of controlling the pool hat.
Layered	It is used to close the pool
buttons	It is used to close sleeves and close pockets

$$0.6020 = 12.04\% \times 5^4$$

$$26.87\% = 17.7346 \div 4.7658^5$$

Magic Tape	It is used for the installation process
sign	It is used to indicate the party using the blessing

Source: Prepared by the researcher based on the Design Division official.

T- Determine the relative importance of the cost of the diabetes mellitus components:

After the components and functions of the components of the military park have been determined, in this step the cost of each component of the military park is determined, in addition to the relative importance of these components, as shown in the following table:

Table (8)
The cost and relative importance of the cost of military park components for the year 2022

the components	Cost component	The relative importance of the component cost
Fabric	8493	66.07%
scalp	2895	22.52%
clouds	110	0.86%
Cotton	90	0.70%
Layered	500	3.89%
buttons	72	0.56%
Magic Tape	395	3.07%
sign	300	2.33%
The total	12855	100%

Source: Prepared by the researcher based on cost records

The relative importance of the cost of the components of the military park was calculated according to the following equation:

The relative importance of the cost of each component = component cost ÷ total component costs

d- Determine the value indicator:

In this step, the value index is determined by dividing the relative importance of each component (job entitlement) by the relative importance of the cost of each agency component:

value indicator= The relative importance of each component (job entitlement) ÷ The relative importance of the cost of each component.

If the value index is greater than one, this means that the relative importance of each component (the functional merit of the component) has exceeded the cost of the component. In this case, the component does not need improvement. However, if the output is less than one, then the component needs improvement in the value of the product. Whether the improvement is in job entitlement (job performance, or quality), in cost, or both together, the optimal value for the job is reached if both outputs equal one, and through the following table the value index for the components of the military park product can be clarified as follows:

Table (9)
Determine the value index for the military park product

the components	The relative importance of product components (1)	Relative importance of the cost of the components (2)	value indicator (1÷2)
Fabric	26.87%	66.07%	0.41
scalp	19.56%	22.52%	0.87
clouds	8.38%	0.86%	9.74
Cotton	8.39%	0.70%	11.98
Layered	8.89%	3.89%	2.29
buttons	10.74%	0.56%	19.17
Magic Tape	7.13%	3.07%	2.32
sign	10.04%	2.34%	4.29

Source: prepared by the researcher based on Table (8) and Table (6).

Based on the value indicators extracted in Table No. (9), the components whose relative importance divided by the relative importance of the cost of their components (value index) is less than one correct need improvements, and they are as follows:

Military cloth.

Scalp cloth.

As for the components for which the ratio of dividing the relative importance of the components by the relative importance of the costs of their components (value index) is more than one correct, they do not need any agency improvements:

(Iron zipper, string, layers, buttons, magic nib, tag)

Therefore, the components that need to be reduced in cost and that are subject to value engineering technical procedures can be identified after identifying the value index for each component, which is both military cloth and fur.

3- Creativity stage:

In the previous stage, the high-cost components of the military park were identified, which need improvements by reducing the cost improving the value, or both together. At this stage, all ideas and proposals are presented through which the cost is reduced and the value of the military park product is improved, and accordingly, work is done to reach a solution. Some ideas and proposals that would reduce the cost without affecting the product's performance and quality (functional merit) or increase the performance and quality of the product, or both together. Accordingly, it was achieved to reduce the cost and increase the functional merit of the military cloth component and reduce the cost of the fur cloth, which contributes to reducing the cost and improving the value. The product.

4- Calendar stage:

After the components of the military cloth and the fur cloth have been identified, which will be subject to technical value engineering procedures, in this step ideas and proposals will be put forward and discussed, and whether what has been proposed meets the desires and requirements of customers. My agencies:

1- The military cloth is purchased from local merchants, and as it is known, it is subject to monopoly, and accordingly, the researcher suggests importing the cloth from China, as it saves costs and increases the performance and quality of the product by saving an amount of 180 dinars per meter, where the military cloth is purchased from the local market At a price of 2980 dinars per meter, with specifications of 65% cotton and 35% polyester, while the fabric imported from China costs 2800 ⁶ dinars, with specifications of 70% cotton and 30% polyester, which contributes to increasing the quality and performance of the military bark.

2- Likewise, about the scalp cloth, it is purchased from the local markets and is subject to monopoly by merchants inside Iraq, and accordingly, the researcher suggested that the commercial division purchase the scalp cloth from China at a cost of 2264 ⁷ dinars, noting that the cost of one meter in the local markets is 2316 dinars, to save 52 dinars The cost of each meter of fabric.

table (10)
The amount of reduction in the cost of one unit of a product

the details	current cost	Amount of change	Cost after change
Fabric	8493	⁸ (513)	دينار 8300
scalp	2895	(65)	2830
clouds	110	0	110
Cotton	90	0	90
Layered	500	0	500
buttons	72	0	72
Magic Tape	395	0	395
sign	300	0	300
Total	12855	(587)	12619

Source: Prepared by the researcher

Table (10) shows that the amount of the cost of the military equipment components has become 12619 dinars per unit, with a reduction of 587 dinars per unit from the current cost, and the following table shows the details of the total cost per unit of the military equipment product

Table (11)
The proposed cost per unit of the military barakah product

cost element	cost per unit
Raw materials	12268
direct wages	7355
Total direct costs	19623
Indirect costs	26169

⁶ The researcher communicated through a third party with a group of factory owners in China

⁷ The researcher communicated through a third party with a group of factory owners in China

⁸ $\div 513 = 2.85 \times 180$

The total cost of the military park	45792
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Source: Prepared by the researcher

5- Development stage

This stage focuses on developing the ideas and alternatives that were chosen in the previous stage. Therefore, at this stage, applicable reports are prepared and proposals, savings and benefits are presented, which are appropriate to the reality of work and develop from it.

6- Presentation stage

At this stage, ideas and proposals are submitted to the beneficiary (the research sample unit) for approval, as well as obtaining additional information, and after approval, they are approved.

The third stage: post-value studies:

It is the last stage of the value engineering technology stage, according to which the implementation of the ideas and proposals that were presented is followed up, as well as ensuring their application and the extent of the designer's response to the ideas and proposals presented.

Chapter Four: Conclusions and Recommendations

First – conclusions

1- The value engineering technique is the most important tool that contributes to reducing costs and improving the value of the product, by modifying the product design in a way that ensures reducing costs without compromising on performance and quality (functional merit) or reducing costs and raising performance and quality.

2- The value engineering technique requires a collective effort to analyze the product into functions and components and work to replace functions and components that do not add value.

3- A factory cannot sell at prices that cover the production costs of its products, as a result of the competitive foreign products offered in the local market at a lower cost.

4- Through the use of value engineering technology and with the support of Quality Function Deployment (QFD), the two components of military cloth and fur cloth were identified, which are subject to value engineering technology procedures. The relative importance of customer requirements was determined, as the two requirements of fabric durability and resistance to weather conditions received 12.04% and 11.87% of the highest relative importance, respectively.

5- Through the use of value engineering technology, the costs of the military park were reduced by (587), where the cost was (45792) after the actual cost before using the VE technology was (46379).

Second: Recommendations

1- The study recommends holding training courses for workers to familiarize them with strategic cost management techniques and developments in the fields of accounting and management, to develop human resources in general and cost accounting in particular in the laboratory sample of the research.

2- The economic unit, the research sample, should constantly communicate with customers to find out information about their desires and requirements regarding the characteristics of the products that meet these desires and requirements and conduct periodic studies and research on the market, to produce products that achieve customer satisfaction and thus their loyalty.

3- The economic unit, the research sample, is clearly interested in value engineering technology through the formation of a work team, because of its role in reducing costs and improving the value of the product.

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