Journal of American Science

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MARSLAND PRESS
Multidisciplinary Academic Journal Publisher

Prepare Amodel for Enhance the Efficiency of the Product Development Processes in Small and Medium Garment Factories

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Abstract: Research summary: This research aims at both: 1- Setting tariffs for small and medium-sized factories and their differences, and knowing the different criteria for defining these factories/identifying the steps of the garment product industry/"stages of clothing production"/knowledge of technology and its role in the garment industry and types of technology and classification. 2- Develop a model to raise the efficiency of product development processes for pre-production fun (sample production stage) and analyze the components of this model, for application within small and medium garment factories through: * Study the constraints and problems facing small and medium-sized factories and the apparent lack of performance of product development processes for the sample production phase.* Study of large factories in the stage of product development for pre-production fun, and know the scientific foundations underlying the production process in these factories and technological developments in the sampling phase, and therefore the sound scientific steps that serve and work to raise the efficiency of this stage. *Work a sophisticated model that can be applied to suit small and medium-sized factories to raise efficiency and improve the quality of the pre-production of the sample section. *The application of the model that was developed within a number of small and medium factories was implemented: A- Apply the model inside a small factory for children's ready-made clothes and take the number 1 sample and take measurements of the sample before applying the model and the result after applying the model. B- Apply the model inside an average factory for children's ready-made clothes and take the number 1 sample and take measurements for the production stages of the sample before and after the application of the model. C- Apply the model inside an intermediate factory for women's pajamas and take 1 sample and take measurements of the production stages of the sample before applying the model and after applying the model. 3. Demonstrate how important it is to apply the model to pre-production (sample production) and a development cycle in both "time reduction, quality improvement, efficiency increase, cost reduction."" 4- Clarify the details of the model used in the development in small and medium factories for the production of samples and a two-part configuration (sample production order model + technical file containing sample production details). 5. There are some differences in the model used for small factories from that used for medium-sized factories, and that is the difference in the use of certain technological technologies to suit the capabilities of small factories not to apply this technology. 6- The model was applied to several samples in several different factories and to clarify the difference and the role of the model in influencing the production stage of the eye of the eye (design and patron, cut, printing, embroidery and operation).

[Maged Mohamed kamal; Nesreen Nasr El din and Rawan Ragaa Ragab. **Prepare Amodel for Enhance the Efficiency of the Product Development Processes in Small and Medium Garment Factories.** *J Am Sci* 2020;16(1):26-44]. ISSN 1545-1003 (print); ISSN 2375-7264 (online). http://www.jofamericanscience.org. 4. doi:10.7537/marsjas160120.04.

Keywords: Small and medium factories - sample production development - preparing a model for development - management of the development of clothing product - technological innovation for product development.

1-Introduction and research problem:

The process of preparing the product for the production process is one of the most important milestones that serve the production process in the pre-production phase;

The process of developing products in garment factories (small and medium) is the basis of the quantitative production process, the manufacture of samples must be based on sound scientific foundations and steps because they are considered the basis of the manufacturing process, and the samples must finally meet the needs of the customer and apply to them all the exact technical specifications that serve the product to carry out the proper production process (1).

Based on exploratory studies, there has been a clear deficiency in the performance of product development processes, and the problem of research can be determined in the following:

* Lack of sound scientific foundations and steps, for pre-production "product development" within small and medium-sized factories.

* Lack of use of technology at the sample design stage.

* Randomly write down pre-production data in a manual file resulting in data loss.

* The implementation of the sample on a material that is not suitable for the specifications of the model that is being implemented, the lack of technical information appropriate for the various products (technical dosia for the model).

* Lack of materials and accessories used in the implementation of the sample sufficient time before the start of the implementation process.

* Cut the sample in a random way and do squeal without marker leads to damage to the sample and the non-accuracy of the sizes (2).

1.1. Small and medium-sized factories in the garment sector

The term small-factor projects includes activities ranging from self-employed or small enterprises, employing a certain number of workers not more than fifty workers in Egyptian legislation, and this term is not limited to private sector establishments, owners, employers, employees, family or domestic production groups, and the great importance of small enterprises in the national economy, both in developed and developing countries, especially in light of the growing need to generate productive jobs. (1).

1.1.1. The difference in definition between small and medium-sized factories in the garment sector:

If we look at the garment factories can be (small and medium factories or large factories or export) and touch in our study on (1) small factories: depend on (small investor with little capital, and may be based initially on manufacturing from home with some simple possibilities, and be a small factory inside the house with materials and simple tools and the use of technology primitive and manual, or it is possible to be a small workshop renting an apartment and equipping it with possible available (1).

(2) Medium factories: also depend on a small investor at the beginning, but it is possible that the capital is moderate or relatively large and the place inside the apartment is larger on a ground floor, or for example inside a ground garage where there are no rooms or roads and therefore the number of walls decreases, which increases the total area of the place, which Makes equipment and materials easy to place and gives you freedom of movement.

* We find that smes have a large symmetry and similarity, a small difference in the size of the capital and in the place is large, or relatively small in the size of resources, and the size of the materials and equipment (1).

1.1.2 Standards for the definition of small, small and medium-sized garment factories:

In general, there is no uniform definition of micro, small and medium-sized enterprises at the level of the world because of the different stages of growth, the degree of technological progress, the different standards applied, and the different economic and social conditions of these countries.

* The criteria on which the definition of these establishments are held have multiplied, depending on the location and background of the entity that complicates these standards in the identification process and it is very difficult to find a dividing line at which small factories differentiate from the medium, although this limit is more pronounced between medium factories. Although there is no agreed general international definition of small, small and medium-sized factories, there is agreement on the basic criteria on which the different sizes of these facilities can be defined, and one of the most common criteria is the following:

1- Definition based on the standard number of employees.

2- Definition based on the criterion of invested capital.

3- Definition based on the standard of production volume - sales volume.

4. Definition based on other criteria such as investment intensity (investment ratio for the number of employees), the share or importance of the enterprise in the market, the value (cost) of fixed assets or fixed capital, and the level of technology used.

1.2- The process of producing garments" steps of the manufacture of clothing product".

* The manufacture of the clothing product is completely different from the stages of the production of clothing, we find as described in figure 1 in the stages of the manufacture of clothing depends on the stages of the advanced beginnings starting from the same fibers involved in the industry through the textile and processing of the fabric from the formulation and processing and then to the stage of production) This is the main stage that is addressed in this research, which includes the development of the clothing product and includes several sections such as design, samples, patronage, examination and individual, and then complete the stages of manufacture of clothing from the arrival of clothing to the consumer, care for clothing and recycling of clothing (3).

"Steps to make a clothing product."

Clothing production is a set of steps based on raw materials to obtain a product that is useful to

humans and may be the production individually for a known person or in whole for the general consumer. (4)

*** Clothing manufacturing stage**

1-2-1-design phase: Design is the financing of an idea to a reality, by investing a set of tools and materials available to produce a restricted work that can be used and utilized; (5) Variables are the basis of expression and are influenced by the foundations of design to give control, integration, balance and rhythm, and the ratio so that the individual finally gets a uniform that makes him feel consistent and connects him to the society in which he lives, and the design of clothing is subject to flexible elements that are easy to switch and form (6).

1-2-2- Sample production phase: The preparation section for the eye is a stand-alone factory, where the paint of the patron, shear, knitting, finishing and finishing, and accordingly any difficulties or problems that may hinder production are overcome (6).

1-2-3-Stage "The patron Section": The "Pattern" is the basis in the garment industry as it is the first step in the production process and the process of preparing the patron of the most accurate functions on which the success of the design depends and affects the quality of the clothing product because it represents the human body in its three dimensions depending on For measurements taken, you need highly qualified and accurate specialists. (7).

1-2-4- The inspection process: this stage prepares the cloth required to carry out the model, usually the cloth is in the form of rollers and when the process begins the cloth is individualised on the allocated table, and it is necessary at this stage to ensure the safety of the cloth from any damage or defects and come the role of this stage which is the inspection process, the pieces are checked Clothing during all stages of operation:

- Before cutting, the mattress is allocated to make sure that all the pieces are in the same size.
- Number the pieces to prevent any interference between the cloth garments.
- There are more than one check point during the different operating stages.
- Check the pieces of clothing after the completion of the operation and before ironing (8).

1-2-5-Section individual and cutting: The cloth required for the implementation of the model is processed and usually the cloth is in the form of rollers and when starting the process the cloth is individualised on the allocated table, the batron is placed on the cloth in the appropriate way for the model and on the nature of the fabric of the cloth taking into account the reduction of the loss of Cloth to a minimum, start the process of cutting the cloth according to the form of the patron that is completely on it with the special cutting machine, sort the cut cloth in groups in certain numbers commensurate with the production process to be carried out, mark the clothes which is a sheet containing all the parts of special clothes to make the process Assembling pieces is easy and can be done by manual marking or computer use, which is called the numbering of cut pieces to learn how to assemble them in the next stages "operating phase") in terms of size and color of the garages used (9).

1.2.6 Preparation section: In this section, the process of assembling the cut cloth is prepared, whether the color combinations or the assembling of sizes to prepare for future operations of chest, back or sleeve assembly to begin the next process, which is the process of operation and manufacture of the product using machines (10).

1-2-7- Operating Section: In this section the process of knitting is initiated, and either the work is individual or collective, depending on the nature of the production process to be carried out and they have a good executed piece of the sample section to work on it and carry out the same for quantitative production, there are machines and workers in this section to carry out operations Such as the manufacture and assembly of parts and auxiliary processes such as processing, and sometimes the single factory is divided into more than one section of operation depending on the variety of products as well as depending on their complexity, the more complex the complexity of the clothes as the production line is divided into small separate sections. (10).

1-2-8- Finishing section: This section does the work of all the final stages, from the disposal of excess threads, and also this section is a common factor between the operating department in the final stages of the product, through the work of the lug and the installation of buttons and so that the product is ready for the next stage which is ironing (9).

1-2-9- Ironing section: This section gives the executed garments their final appearance, through the final ironing processes the full clothes are examined here according to the specifications of the buyer, the final examination is done in manual way until you are sure that they are free of defects and then the clothes are ironed and prepared for the packing stage (10).

1-2-10-Packing section: Where the clothes are filled in custom bags, depending on the size and type of clothing, as well as the label of the clothes before packaging, in order to give the clothes a certain brand that can spread in the markets the clothes are filled using a manual method to reduce the damage of clothes, all clothes must contain fees and marks, through which the instructions of the buyer can be maintained, these processes are done manually after

the completion of all the required processes, and are sent at the end to the buyer (9).

1.2.11- Final Examination Section: The final examination section gives an opinion before storing the clothes for each piece if it is valid or invalid.

1.2.12- Store section: All pieces of clothing are counted and received and properly placed to maintain them until they are delivered.

1.3 Technology and its role in clothing manufacturing

1.3.1The concept of technology:

The practical and scientific application of things, the systematic application of the results of science and all other knowledge organized to achieve new skills, a set of knowledge, skills and expertise to manufacture a new product or products, the technical methods applied in the production process and the orientation of knowledge in this type of production, are the means used by man to complement the lack of capabilities and to fill the lack of society at a certain stage of its development.

1.3.2 Types of technology:

1. Material technology as tools and equipment.

2. Social technology includes job description, pay system, command, communication, control and decision-making procedures, and everything that aims to regulate conduct and relationships between individuals in a purposeful and orderly manner through a detailed structure of control systems.

1.3.3. Classification of technology in terms of work characteristics:

The united states of Great Energy, the United Where types of individual products are prepared, to suit the specifications requested by the customer in specific sizes and may be to deal with certain physical defects, using uncomplicated machines or equipment and the worker completes the entire piece, and since it is a simple technology it depends on the individual skills of the worker whose work takes the character of the craft work (.12)

(b) Large-batch production technology.

In it, production depends on complex semi-machines with large numbers of workers in modular motor cycles, so that each worker completes a certain process until large numbers of legalized products are finally produced.

1.3.4 Technology requirements and technological change:

Planning, developing the human element and improving its conditions, opening up to new experiences, taking advantage of security technology, developing local technology, conducting and applying scientific research, and as a result of the development of technology, there have been modern technologies in the last few years that have developed rapidly and effectively, towards improving the productivity of the work assigned to them within garment factories and doubling the advantages, and overcoming most of the industrial defects in this field (13).

2. Search goal:

Develop innovative solutions to increase the efficiency of product development processes in small and medium-sized garment factories.

* Highlight the importance of using appropriate technology to promote and develop the product and raise the efficiency of the product.

* Design a model for the product development process in small and medium garment factories, in order to raise the competitiveness of these factories and better meet the needs of the customer while reducing the loss of time, quality and cost.

3. The importance of research:

The importance of research lies in highlighting the stage of product development within small and medium factories, and trying to raise the efficiency of the product and promote it by using best practices, tools and techniques, and trying to overcome the problems faced by this stage.

4. Research methodology:

The research follows the analytical and experimental descriptive approach (case study).

5- Search limits:

1- Some factories producing medium and small garments within Cairo and Giza governorate.

2- Develop the product and raise the efficiency of production for the pre-production phase (sample production stage).

6. Practical study:

6.1 Study of factories

*A study was carried out for a number of small and medium factories included the study of the obstacles and problems facing these factories to know the apparent deficiency in the performance of the production processes for the pre-production (production phase) and the problems were identified through this study such as "The lack of technical basis and proper scientific steps for the pre-production/data recording randomly and the absence of a file to collect data/not specify the raw material on which to design and implement the sample on a raw material that is not suitable for the specifications of the model /lack of raw accessories in the presence of raw materials and accessories in the presence of raw materials The sample is executed well enough before the start of the implementation process.

* A study has also been carried out in a number of large factories to find out the practical foundations of sample production and models used by these factories and advanced technological steps to advance and take advantage of large factories in the work of a model to arrange the production process in the sample industry to suit the capabilities of small and medium

factories to raise efficiency, improve quality and reduce the time lost.

6.2 Factories executed

* A number of different factories have been selected from medium factories in the field of children's clothing and medium in the field of women's clothing (pajamas) and the selection of a small factory in the field of children's clothing.

*A different set of samples has been applied according to the usual method of production of the sample within each plant and the stages are (design/patronage/cut/folding or embroidery/operation).

*Measurements of samples were worked and taken in the usual manner for each plant at each of the different production stages of the sample.

*Many errors have been observed at each stage and many obstacles and problems due to the lack of a precise system and the lack of use of a model to arrange the production process of the sample and random in application, which led to the loss of a lot of time and effort and increased cost and lack of quality in the samples produced.

6.3 Model work for small factories

*A model has been reached to suit the capabilities of small factories and make some modifications to this model showing some addition to suit the possibility of applying to the medium factories and the model consists of (preparation orders for the production stages of the sample + technical file for the sample)

6.3.1 First: Preparation orders for the production stages of the sample

6-3-1-1- Sample design order

A- Contains the material on which the design will be executed and attached to a piece of cloth.

B- Contains the required sizes for the model.

C- Contains the sample size that will be executed.

D- Contains the type of design to be implemented is it, for example, a model for my daughters or boys.

E- Contains the number of colors that the model will perform (model mariag).

Advantages of this model: We find in this order a lot of facilities on the designer sample we find ease in thinking in the form of model design for the availability of the model type required, ease in the implementation of the colors of the model for the availability of the specific material that is implemented on it, ease in the implementation of the size of the model to determine the size required, ease in the choice of color degrees to know the implementation of the model on one garage or several garages we find savings in the time of design and in the effort and accuracy and speed of implementation.

6-3-1-2- Order to prepare the patron

A- Contains the name of the client whether the implementation of the factory or an outside implementation, b-contains the material to be executed, c-contains the model number for easy trading of data and accuracy of data, D-contains the time of the implementation season for non-interference of model data, e-j Contains the number of color garages of the model, and - contains a detailed description of the name of the model, g-contains the size of the sample executed and contains the sizes of this model, h- contains the story type of the model in the quantity or body and type of material in each part.

Advantages of this order in this model: we find in this order a lot of facilities on the port of The patron we find accuracy in the implementation of the presence of advance details in all details, speed in time for the presence of the pre-order of the preparation of sample design which contains all the details of the sample of the required sizes and the raw material implemented on it, and the presence of the form of the design in all details of the stories facilitates in the implementation of the patron and the design on the model albatron for the availability of sufficient information for the model and form.

6-3-1-3- Shear Order

A- Contains the name of the client whether the implementation of the factory or an outside execution, b- contains the raw material to be executed, c - the presence of the model number for the ease of data trading and data accuracy, D-contains the time of the implementation season for non-interference of model data, e-contains The number of color features of the model, and - contains a detailed description of the name of the model, g-contains the size of the sample executed and the sizes of this model, h- contains the story type of the model in the quantity or body and type of material in each part.

Advantages of the order in this model: the presence of all the details of the outlet of the cutting process in this matter, the percentage of errors in the process of cutting the sample is reduced and in this order is determined the cloth required based on the presence of the preparation of the design of the sample and worked with it a drainage permission to carry the cut on this cloth so the percentage of errors in the process of selecting the specified cloth is reduced.

6-3-1-4- Embroidery or printing order

A- Contains the form part of the model executed the process of embroidery or printing, B- contains all the details of the model number and the cloth used and the name of the customer, c- contains specifications for embroidery or printing, d contains the colors used in the sample of embroidery or printing, in this order facilitates the speed and accuracy in the process of

implementing embroidery and printing and reduces the rate of errors.

6-3-1-5-Operating order

A- Contains the name of the client and model paper for non-interference of the data, B-contains the sample execution season, c-contains the type of cloth used, d-contains the color-of-the-sample mares, e-contains the accessories used in the operation of the sample, and - contains the specifications of the operation of the sample and the method of the selection.

There is a usefulity in having all the details that will be implemented, reducing the rate of errors and reducing the loss of time due to the availability of sample accessor is used in the operation because of the presence of all the data.

*Note: In all previous orders, a picture is placed in the form of the executed sample and contains all the details of the design of the model, and shows in a total the form 1, 2, 3, 4 and 5 the shape of the model in the preparation orders for the production stages of the sample.

6-3-2-II: The technical file of the sample

The technical file of the sample consists of both

1- Model design image, 2-model description details "model name, model number, model material, color fabrics" 3-model sizes and sample size, 4-model manufacturing details" tailoring type", 5-accessories included in the model of yarns, tickets and Tiger size,6 - details of the number of pieces of the batron for the model,7-image back and front of the model and clarify details of embroidery or printing and places of installation of accessories and type of tailors, 8 - details of embroidery or printing drawing and place dispositioned and precise size, 9 details of all sizes of the sample such as "width The neck, the length, the width of the chest, explaining it on the sample drawing.

(1)

<table>
<tr><td colspan="8">prepare asample design</td></tr>
<tr><td colspan="8">client</td></tr>
<tr><td colspan="2" rowspan="5">model description and design</td><td colspan="6">name of model</td></tr>
<tr><td colspan="6">material design</td></tr>
<tr><td colspan="6">model number</td></tr>
<tr><td colspan="6">season</td></tr>
<tr><td colspan="6">the type of design to implement</td></tr>
<tr><td colspan="8">model design colors</td></tr>
<tr><td colspan="3"></td><td>color 2</td><td>color 1</td><td>material</td><td colspan="2">style type</td></tr>
<tr><td colspan="3"></td><td></td><td></td><td></td><td colspan="2"></td></tr>
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<tr><td colspan="3"></td><td></td><td></td><td></td><td colspan="2"></td></tr>
<tr><td rowspan="2">sample size 6-9</td><td colspan="5">model sizes</td><td>color</td><td colspan="2">description material</td></tr>
<tr><td>n.b</td><td>0-3</td><td>3-6</td><td>6-9</td><td>9-12</td><td></td><td colspan="2"></td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2"></td></tr>
<tr><td colspan="8">notes</td></tr>
<tr><td colspan="3">design officer quality officer</td><td colspan="5"></td></tr>
</table>

6--3-2-1 - Features and usefulness of the technical file

1- Availability and work of equipment for accessories of (yarns, asatik, zerière and kabassien) before starting the implementation of the sample is provided from the operating time for non-stop sample, 2- Avoid errors in the tones in the use of printing or embroidery to contain the technical file on the sample and clarify all the tones in it, 3- Availability of embroidery threads necessary sufficient time before the implementation of the sample, 4 - determine the number of parts of the full albatron do not discover an uncut piece on the patron and thus avoid the loss of time and consumption of additional time to return to cut again and cut the missing piece on the patron,5 - the presence of a picture of the operating details of the sample The presence of model details and external threads on the model facilitates the implementation of the design as required and not to lose any of the operating points for example, the work of external spray using 2 needles to show the shape of the design of the sample,6 - determine the installation of pads in the required places on the sample saves in time and

not to unpack the sample again To install the pads in the desired place as in the design.

6.4. Model for medium factories

As is in the steps of the work of the model for small factories and the same configuration of the model of production orders and technical file of the sample but is added to the production orders technology factors can be applied in medium factories so it is added in the design order of the sample implementation of the design using the computer so the software was used The design is also added in the order of the battery the use of the design program for the computer patron in accordance with the developments somewhat in the medium factories and the possibility of applying by technological factors and the existence of possibilities for it and using technology will be saving effort, time and high quality and this will be realized in Statistical results.

Used model with pictures.

First: Prepare orders for production stages for sample

(2)

preparation order for patron

model description and design	client
	name of model
	model number
	season
	material design

color 2	color 1	material	style type

sample size 6-9	model sizes							color	description material
	n.b	0-3	3-6	6-9	9-12	12-18	18-24		

patron officer notes

quality officer

(3)

cutting order

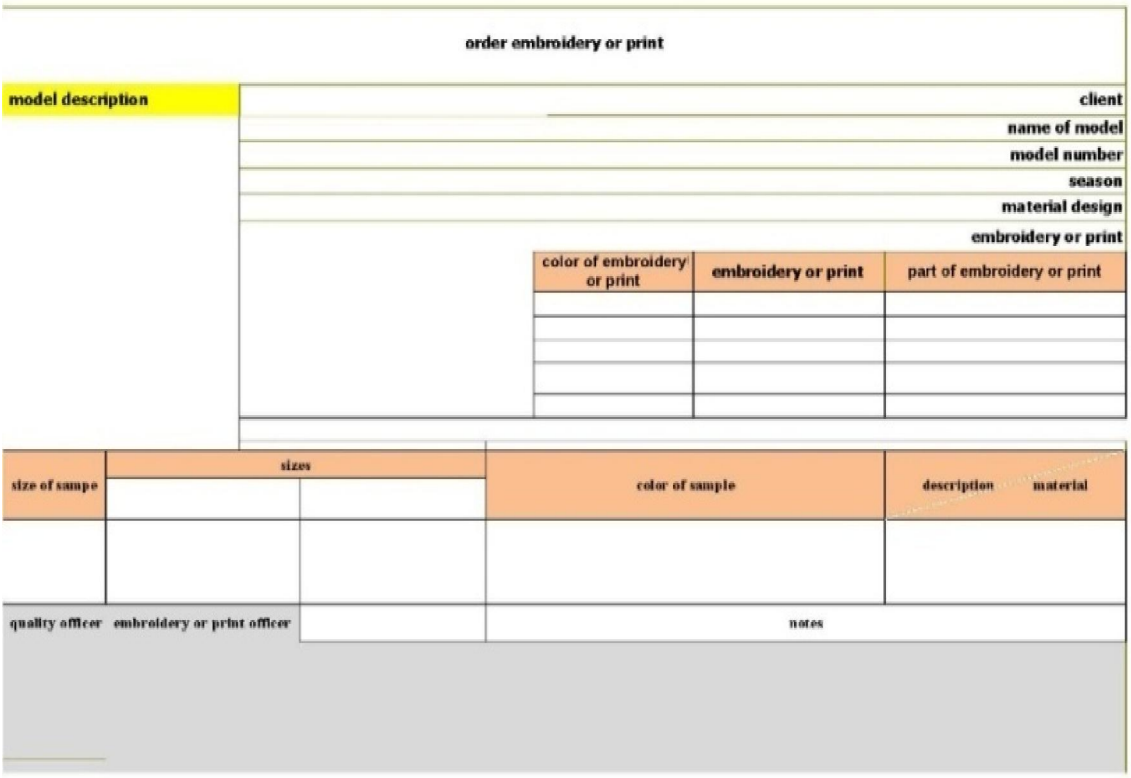
model description	client
	name of model
	model number
	season
	material design

ask for sample cloth	color 2	color 1	material	style type
fabric type				
cloth quantity				
color				

model sizes					color	description material
n.b	0-3	3-6	6-9	9-12		

sample size					notes
quality officer		cutting officer			

(4)



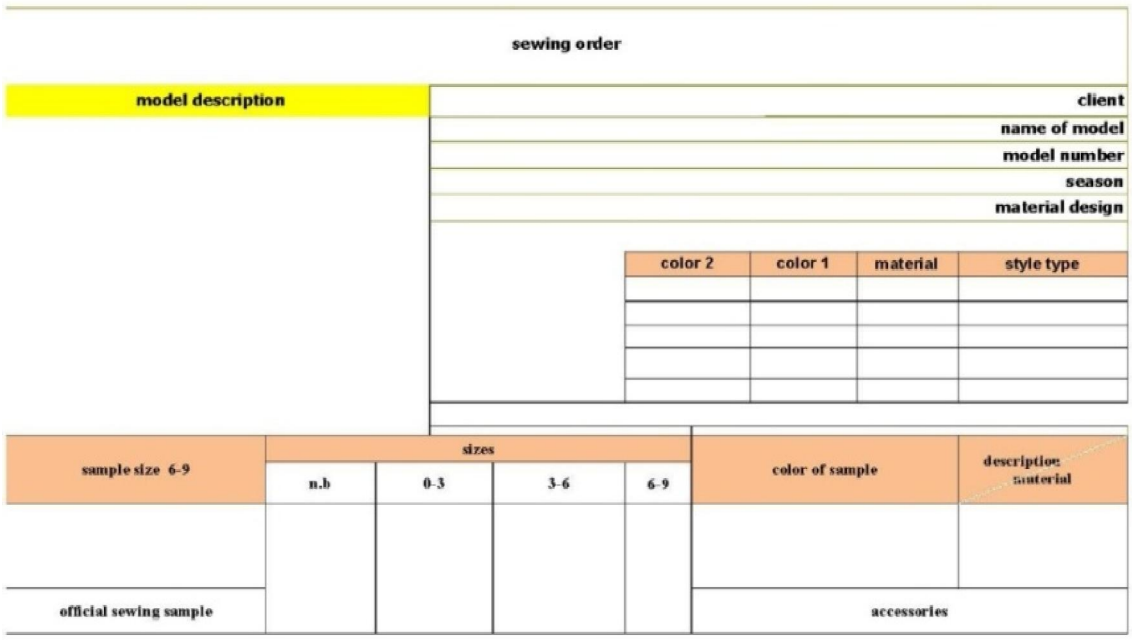
order embroidery or print

model description	client
	name of model
	model number
	season
	material design
	embroidery or print

color of embroidery or print	embroidery or print	part of embroidery or print

size of sampe	sizes		color of sample	description material
quality officer embroidery or print officer		notes		

(5)



sewing order

model description	client
	name of model
	model number
	season
	material design

color 2	color 1	material	style type

sample size 6-9	sizes				color of sample	description material
	n.b	0-3	3-6	6-9		
official sewing sample					accessories	

Second: technical file for sample

(6)

Brand :		Model Descrition :		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

Manufacturing Details		Picture	Size Ratio			
Interior Seams :	over 4 petals		0-3	3-6	6-9	9-12
Exterior Seams :	singer(foot width)				1	
Neck Tape :	_____		Color			
Elastic Tape :	elastic 3 c.m		COL.1		COL.2	
Embroidery :	like picture		blue		grey	
Accessorize & Labels:			Comments			
Thread :	blue-grey		number of pattron 16			
Buttons and Snaps :	_____		number of Tshirt 9			
Care Lable :	% 100 قطن		number of trouser 7			
Main Label :						
Size Label :						
Packing :						

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(7)

Brand :		Model Descrition :		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

Front & Back

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(8)

Brand :		Model Description :		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

Print & Embroidery

place of embroidery:
Number of embroidery:
Embroidery time:

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(9)

Brand :		Model Description :		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

المقاسات

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(10)

Brand :		Model Description :		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

sizes of T.shirt

المقاس بالسم	الكود
12 c.m	A
3.5 c.m	B
20 c.m	C
26.5 c.m	D
24 c.m	E
6 c.m	F
12 c.m	G
5.5 c.m	H
0.5 c.m	I
24 c.m	J
9.5 c.m	K
27 c.m	L
19.7 c.m	M
3 c.m	N
3 c.m	O

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(11)

Brand :		Model Description :		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

sizes of trouser

المقاس بالسم	الكود
18.5 c.m	A
6 c.m	B
1.5 c.m	C
9.5 c.m	D
8 c.m	E
15 c.m	F
17.5 c.m	G
3 c.m	H
35 c.m	I
3 c.m	J
24.5 c.m	K

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(12)

Brand :		Model Description : طقم		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

the stages of running a t.shirt				
time	notes	type of machine	stages	number

(13)

Brand :		Model Description :		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

the stages of running a trouser				
time	notes	type of machine	stages	number

(14)

Brand :		Model Description :		Model Code
Modeliste :		Fabric :	cotton melton	
season :	Autum - Winter 2020	Manfacturing Status :	Sample	
Gender :	Boys	Quantity :	One piece (6-9 M)	
Size :	0-12 M	Creation date :		

quality report			
editing suggestions	rating	Quality control notes	number
			1
			2
			3
			4
			5
			6
			7
			8
			9
			10
			11
			12
			13
			14
			15
Quality controller :			

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6.5. Analysis of the implementation of clothing samples in small and medium-sized factories before and after **application of the model**

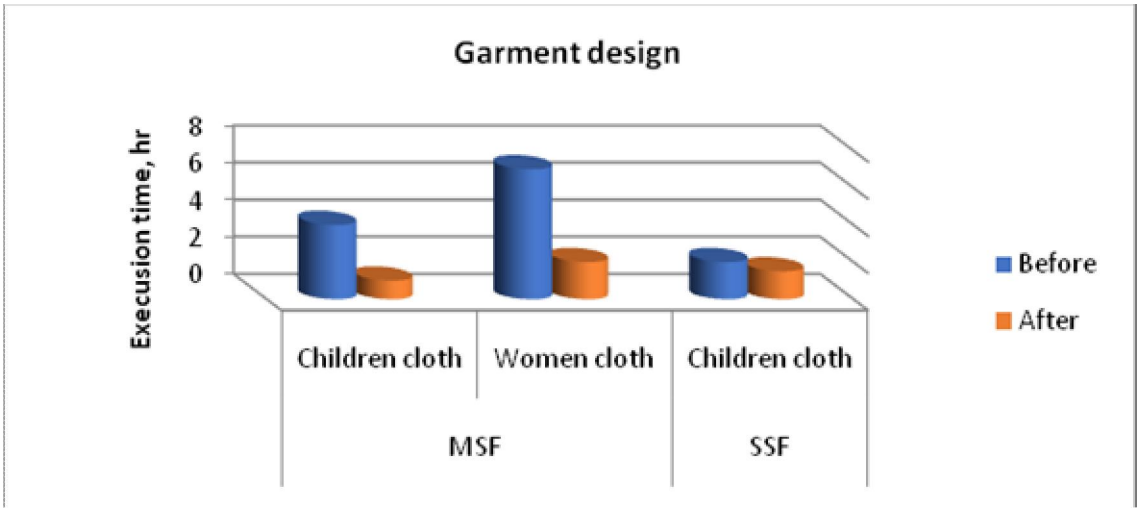
6.5.1. Medical analysis of the sample's production stages

6.5.1.1- Sample design analysis

*Sample 1 children, sample 2 harem product: Applied to an average factory measurements were taken for a sample before applying the model in the design process, found the implementation time of the sample large and after applying the model was saved in the time of implementation due to the presence of the technical file and sample design orders and found raw data that is executed I found the sizes of the model required to design and the required sizes and type of model so it is easy for the designer to think about the work of the model and its design easily and take less time in implementation and according to the use of technology in the model of medium factories and enter the design computer use program fattoushup To design and implement the core of the sample in less time after the application of the model.

* Sample 3 children are applied to a small factory and take measurements for the sample before applying the model in the design process and after applying the model found the design time less after using the model that contains design orders and the presence of the type of material used for design and type of model and the required design sizes This is easy and saves the designer time to implement the design and think about it.

Table 1 shows the implementation of sample 1 of the factory average children and sample 2 factory medium haremi pajamas and eye 3 small plant children explains the implementation time of the design before using the model and after using the model and shows the value of the model in reducing time and form1 shows time by hours and compared to the design time before the implementation of the model After implementation and shows the value of using the model and table 2 shows the moral value of a comparison before and after the application of the model, the calculated morale was.009, i.e. there is a statistical function in terms of.01.



Form (1) shows time in hours and comparing time before and after implementation of the model

Table (1) Implementation of sample 1 for the factory average children and sample 2 factory medium harem pajamas and eye 3 small plant children explains the implementation time of the design before using the model and after using the model and shows the value of the model in reducing time

0	0	**Before**	**After**
MSF	**Children cloth**	4	1
	Women cloth	7	2
SSF	**Children cloth**	2	1.5

Table 2 shows the moral value of a comparison before the model is applied for design time and after application.

	Before	*After*
Mean	4.3333	1.5
Variance	5.0667	0.2
Observations	6	6
Pearson Correlation	0.596	
Hypothesized Mean Difference	0	
df	5	
t Stat	3.4415	
P (T<=t) one-tail	0.0092	
t Critical one-tail	2.015	
P (T<=t) two-tail	0.0184	
t Critical two-tail	2.5706	

6.5.1.2- Paternity sample analysis

*Sample 1 children, sample 2hy product: Applied to an intermediate factory was applied before the use of the model and after the use of the model was found saving time after the application of the model due to the presence of model data it is easy for the designer of the petron in the design details and due to the use of technology in the model for medium factories There was a big difference in saving time after applying the model as for the quality element of the dress up found after applying the model using the computer design program using the drupor and found a higher quality after applying the model to the samples.

*Sample 3 children: it is applied to a small factory and take measurements of the sample before applying the model in the process of the patron and after applying the model found time of the patron less after the use of the model due to the presence of model data it is easy on the designer of the patron in the design details.

Table 3 shows the implementation of sample 1 for the factory average children and sample 2 factory medium harem pajamas and sample 3 small children factory shows the implementation time of the patron before using the model and after using the model and shows the value of the model in reducing time.

Form 2 shows the time in hours and a comparison of the time of the yitron before the

implementation of the model and after the implementation and shows the value of using the model and shows the table 4 value of the value of the patron before using the model and after using the model and found a moral difference and the calculated moral value.005 which is a statistical function of the significance of.01.

Table 3 Implementation of Sample 1 for the factory average children and sample 2 factory medium harem pyjamas and eye 3 small plant children explains the implementation time of the patron before using the model and after using the model and shows the value of the model in reducing time.

0	0	**Before**	**After**
MSF	**Children cloth**	7	5
	Women cloth	12	9
SSF	**Children cloth**	2	1.5

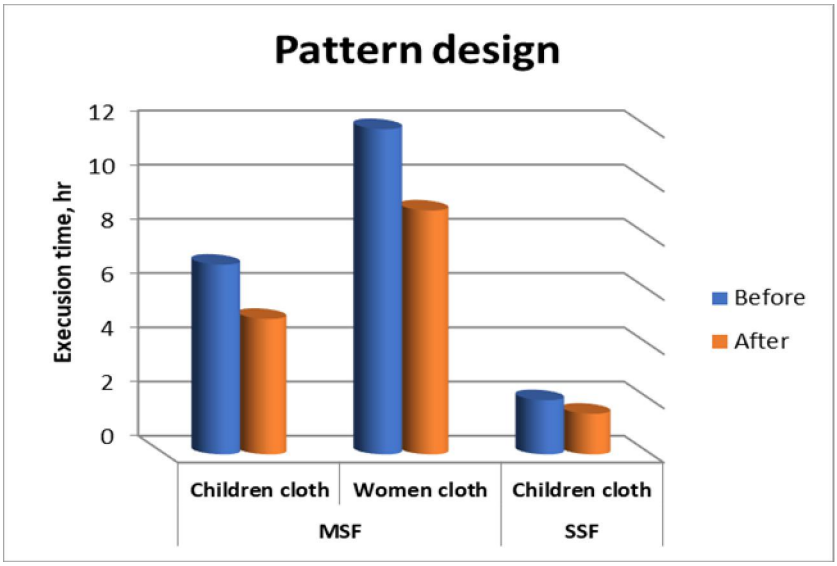


Figure 2 shows the time in hours and a comparison of the time of the etron before the implementation of the model and after implementation and shows the value of using the model

Table 4 shows the moral value of a comparison before the model is applied for design time and after application

	Before	*After*
Mean	7	5.1667
Variance	20	11.267
Observations	6	6
Pearson Correlation	0.9993	
Hypothesized Mean Difference	0	
df	5	
t Stat	3.9901	
P (T<=t) one-tail	0.0052	
t Critical one-tail	2.015	
P (T<=t) two-tail	0.0104	
t Critical two-tail	2.5706	

Figure 3 shows the statistical results of the dressing of the samples before the use of the model and after the application of the model and notes an improvement in the quality of the dress after the application of the model and shows table 5 implementation of sample 1 for the factory average children and sample 2 factory medium haremi pajamas and eye 3 small plant children before the use of the model and after use The model shows the quality of the dressing and shows a table of 6 of the moral value of the dressing comparison of the patron before the model and after the application of the

model and found the calculated morale.03 which is statistically didded.01

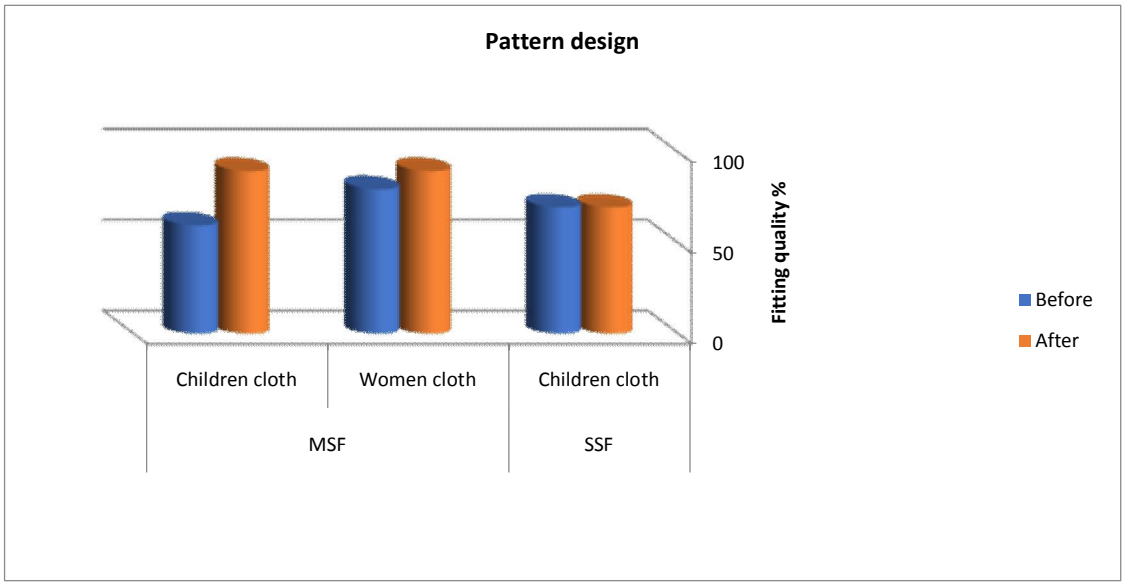


Figure 3 The statistical results of the dressing of the samples before the use of the model and after the application of the model

Table 5 Implementation sample 1 for the factory average children and sample 2 factory medium harem pajamas and eye 3 small plant children before using the model and after using the model to show the quality of the dress

0	0	**Before**	**After**
MSF	**Children cloth**	60	90
	Women cloth	80	90
SSF	**Children cloth**	70	70

Table 6 moral value to compare the dressing of the patron before the model and after applying the model

	Before	*After*
Mean	70	83.333
Variance	80	106.67
Observations	6	6
Pearson Correlation	0	
Hypothesized Mean Difference	0	
df	5	
t Stat	-2.39	
P (T<=t) one-tail	0.0312	
t Critical one-tail	2.015	
P (T<=t) two-tail	0.0624	
t Critical two-tail	2.5706	

Table 7 shows average diffraction in sizes before the application of the model and after applying the model to a sample of children 1 mediocre factory and sample women's pajamas 2 medium factory found after applying the model better in the accuracy of sizes due to the use of technology in the model and the use of the computer patron program of the jarber found a diffraction Fry in sizes after applying the model and shows the form 4 average diffraction of the samples after using the model and found accuracy in the measurements and a simple degree of diffraction.

Table 7 shows the average diffraction in sizes before applying the model and after applying the model to a children's sample 1 mediocre plant and sample women's pajamas 2 medium factory found after applying the model better in the accuracy of the sizes

Size deviation, cm		
MSF	**Children cloth**	**1.13**
	Women cloth	**0.81**

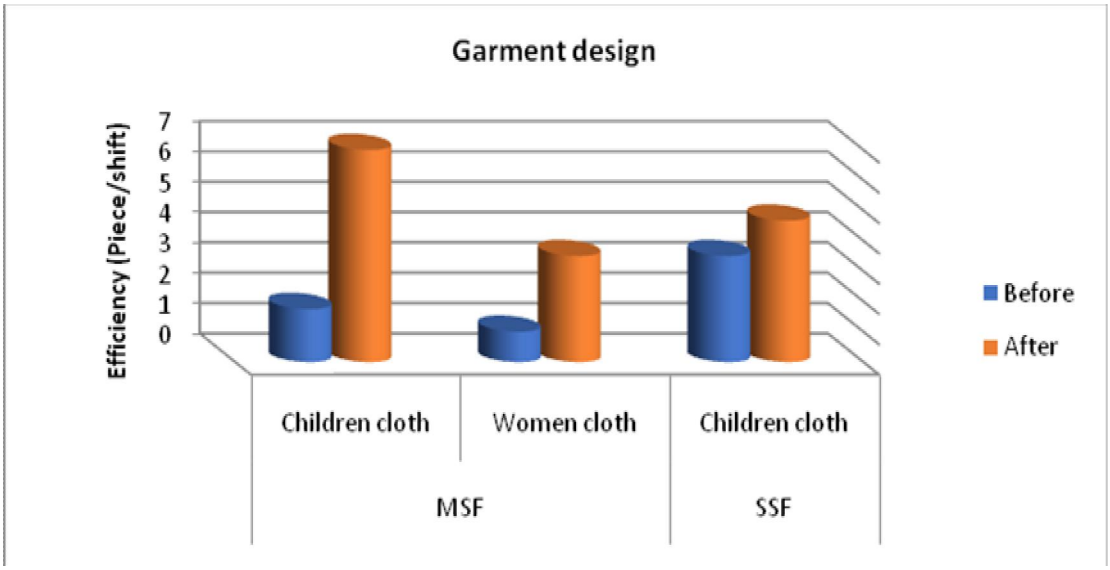


Figure 15 demonstrates the design efficiency before and after the application of the model and the improvement in efficiency for after using the model

Table 8 shows the value of design efficiency before and after use of the form

t-Test: Paired Two Sample for Means

	Before	*After*
Mean	2.0833	5.0556
Variance	1.3167	2.5407
Observations	6	6
Pearson Correlation	0.1063	
Hypothesized Mean Difference	0	
df	5	
t Stat	-3.909	
P (T<=t) one-tail	0.0057	
t Critical one-tail	2.015	
P (T<=t) two-tail	0.0113	
t Critical two-tail	2.5706	

Statistical analysis found that the efficiency of applying the model to the samples as in form 16 and table 24 shows the efficiency of the shear before and after the application of the model and table 25 shows the statistical evidence and the value of the ratio of the ratio of.03, which is statistically deda in lieu.05.

Table 9 shows the efficiency of the shear before and after the application of the model

0	0	**Before**	**After**
MSF	**Children cloth**	9.3333	21
	Women cloth	16.8	20
SSF	**Children cloth**	42	42

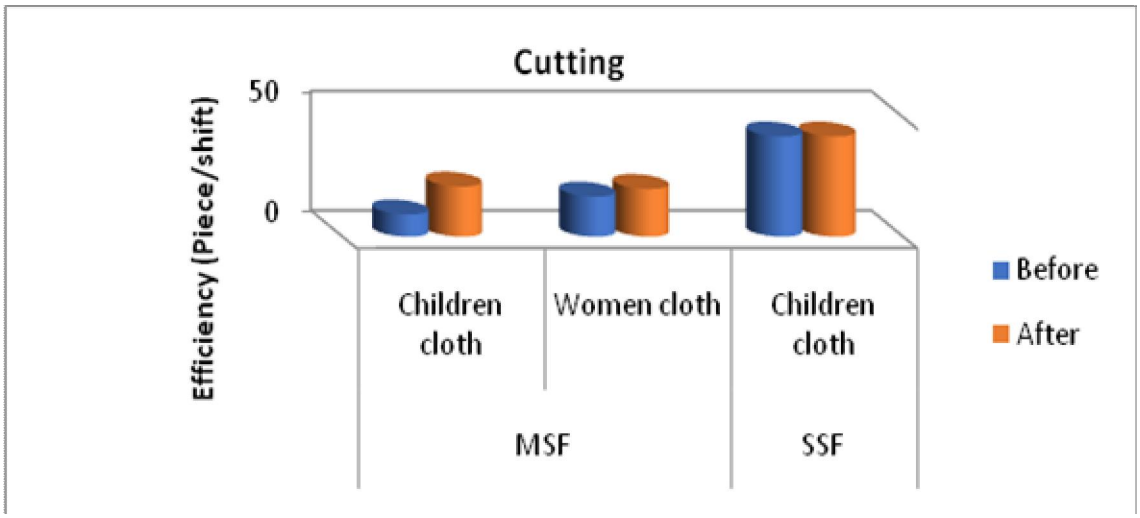


Figure 16 demonstrates the efficiency of shear before the application of the model and after the application

Table 10 shows the statistical evidence and the calculated moral value

t-Test: Paired Two Sample for Means

	Before	*After*
Mean	22.711	27.667
Variance	234.39	123.47
Observations	6	6
Pearson Correlation	0.9664	
Hypothesized Mean Difference	0	
df	5	
t Stat	-2.251	
P (T<=t) one-tail	0.0371	
t Critical one-tail	2.015	
P (T<=t) two-tail	0.0742	
t Critical two-tail	2.5706	

Statistical analysis found to raise efficiency by applying the model to samples as in figure 17 and Table 26 showing operating efficiency before and after the application of the model and found the process of improvement in efficiency for after the use of the model and Table 27 showing the value of t before the use of the model and after use for operating efficiency and found the value Calculated morality is equal to.0009.

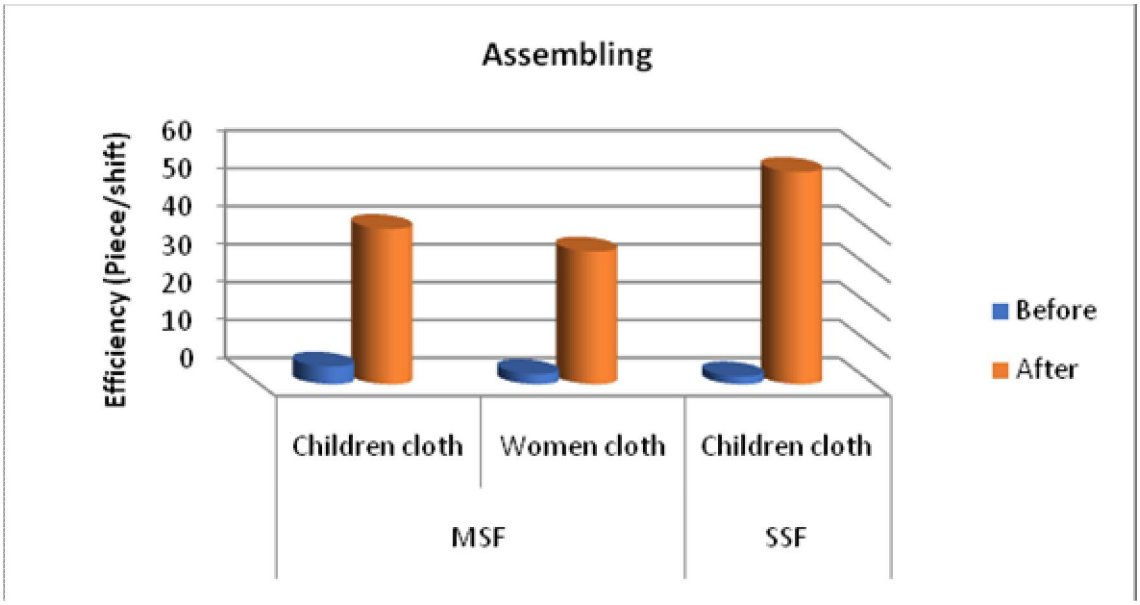


Figure 17 demonstrates the operational efficiency before and after the model for samples

Table 11 shows operating efficiency before and after the model is applied

0	0	**Before**	**After**
MSF	**Children cloth**	4.6667	40.976
	Women cloth	2.7097	35
SSF	**Children cloth**	2.1	56

Table 12 shows the value of t before and after use of the form for operating efficiency

	Before	*After*
Mean	3.1588	43.992
Variance	1.4386	93.659
Observations	6	6
Pearson Correlation	-0.456	
Hypothesized Mean Difference	0	
df	5	
t Stat	-9.73	
P (T<=t) one-tail	1E-04	
t Critical one-tail	2.015	
P (T<=t) two-tail	0.0002	
t Critical two-tail	2.5706	

7. Results:

1- Reducing the time used in the sample production process in many production stages, for example at the design stage, the patron is significantly reduced to use the technology and its application in medium factories.

2- Increase the quality of the sample produced using the model for the absence of any errors in the implementation process and reduce technological defects.

3- Accuracy in the sample sizes of clothing produced by the model for the accuracy of the technological programs used in the making of the batron.

4- Reducing the cost and loss in more samples and fabrics to apply a model containing the technical file containing all the data and details of the sample, which led to not repeating the sample again because of the lack of defects in its manufacture.

5- Saving effort and time in the operating phase for the availability of all sample accessories as in the technical file in the form does not occur a stop for the sample because of the lack of such buttons or stick suitable for the sample, so reduce the waiting time of the accessory for the sample.

6- Get a high efficiency of the sample by applying the model used to contain accurate production orders next to the technical file which contains all the details for the production of the sample, thus reducing the percentage of errors in the implementation of the sample.

7- The impact of the model in the pre-production development in small and medium-sized factories and the role of the model in the promotion of the sample in both (reducing the implementation time, increasing efficiency, increasing quality, reducing costs).

8. Recommendations:

1- It is recommended to use and apply the model to small factories, in the pre-production stages "sample production", in order to raise the efficiency of operations at this stage, save time and cost and raise the quality in the production of samples, thus serving the following stages of kidney production of the plant.

2- It is recommended that the research apply the model to the medium factories in the stages of sample production, in order also in order to improve the stage of sample production and raise the efficiency of production, and the possibility of adding technology to medium factories and applying them to suit their potential, which led to a large boom; Medium after application of the model in the stages of sample production.

3- It is recommended that the research use the elements of the model complete, to suit the possibilities for small and medium factories, including the elements of the model (orders for the stages of production of the sample + the technical file of the sample in the internal details of all parts of the sample), and the technology is added to the orders stages of sample production for medium factories Because they can be provided and used.

4- It is recommended that the research pay attention to the stage of production of samples in terms of organization and preparation well because of their influential role in the advancement of small and medium factories and save a lot of time and effort and raise the efficiency of the productive process.

References

1. Wilcsek, J.“Modern small and medium-sized factories industry”, Actao economical, Vol. 6, No.4, 1971.
2. J, Hyeon., J, Byounghon.“What explains small and medium sized apparel retailer’s international market involvement?”, Textiles Intelligence, Vol. 22,2015.
3. W, Cooklin.“Business and market analysis for the global textile and apparel industries”, Textile out look International, No. 192, july,2018.
4. C, Gerry. “Introduction to clothing manufacture”, Wiley,1991.
5. T, David., L, Carr. “Technology of clothing manufacture”, Black well,2015.
6. G, Jelka. “Design of clothing manufacturing processes”, Wood head,2013.
7. Z, Nancy. “Pattern fitting”, Fraser,2008.
8. H, Gillian.“Pattern cutting made easy”, Bats Ford,1997.
9. D, David. “The technology of clothing manufacture”, Wiley black well,1994.
10. S, Alison. “The sewing book”, Dorling Kindersley,2009.
11. N, Rajkishore. P, Rajiv.“Garment manufacturing technology”, Wood head,2015.
12. J, Kern. Vogt. “Future fashion economics aguide to future oriented responsible economic thing in the fashion industry”, Frank furt, dfvmediengruppefach buch, 2017.
13. Liubing, “product development processes and their importance to organizational capabilities“, Master, Chinese academy of science, 2003.

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