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## **Improvement of the process of wool fabric production in the enterprise Plater**

### **Overview**

Enterprise Zakłady Przemysłu Wełnianego im. Emili Plater S.A. (named in the text as Plater) was formed in 1950 to manufacture wool fabrics. Plater was a state owned enterprise that has been changed into private enterprise in 1996. It is situated in Wasilków near Białystok. In Poland the majority of the textile sector is in Łódź or Bielsko – Biała. Plater is situated far from its competitors and also clients, but close to Ukraine border.

**Firm's structure.** Plater has a functional structure. The enterprise has four main functions – finance, production, sales and marketing, administration. There are 620 employees. More than 50% of them are directly in the production process.

**Aims.** The main aim of the firm is to produce high quality woollen wool fabrics,<sup>1</sup> and also blended wool – synthetic fabrics, synthetic fabrics, synthetic pleads.

**Main products.** The three main types of produced fabrics are: an outer garment fabric, costumes fabric, suits fabric. In the production process of those three types of fabrics are used both woollen wool and synthetic yarn that is made by the enterprise itself. For the production of costumes fabric ready worsted yarn is bought. The enterprise produces on average 1,8 million metres of fabric each year. 67% of the production constitute garment fabrics, the remaining 33% – decoration fabrics (18%), shoes fabrics (3%), pleads (11%). Generally the production structure remains unchanged, although some new trends can be observed such as the growth of outer garment fabrics and suits fabrics together with the decline of costumes and shirt fabrics. Production is strongly seasonal, there is a strong decline in the sales in spring and summer. Prices of Plater products are lower than prices of imported fabrics, but the quality of finishing is also lower. In comparison with domestic producers Plater prices are at the same level. Plater logo is known among garment producers but is connected with rather lower quality products.

**Sales.** Plater sales its products to garment producers, fabrics wholesalers and also retail shops. It has also own retail shop. The majority of the production is sold on the domestic market; export constitutes about 30% of the quantity of sales. On the domestic market Plater sales mainly garment fabrics and shoes fabrics. There is growing demand for outer garment on the domestic market. This tendency is reflected in the change of Plater production structure. Decoration fabrics (nearly 98%) and pleads (nearly 70%) are exported. Garment fabrics constitute a very small part of the total export.

**Customer relations.** There are three groups of Plater clients on the domestic market: well known garment producers like Wólczanka, Vistula, Delia, Bytom (nearly 12% in 1998 of the whole sales); wholesalers (45%) and small garment producers, retail (own shop) and small wholesalers (43%). The enterprise sales more than a half of its production by her own, the remaining 45% goes to the wholesalers. Most of the exported decoration fabrics is sold through the middleman ( Textilimpex).

**Process used.** Operations involved in producing fabric cover:

1. Buying and organising the delivery of raw materials (wool, components for dyeing, etc.).

2. Spinning – at this stage washed and combed wool is put on the spinning machine and converted into yarn.

3. Weaving – process of making fabric from yarn.

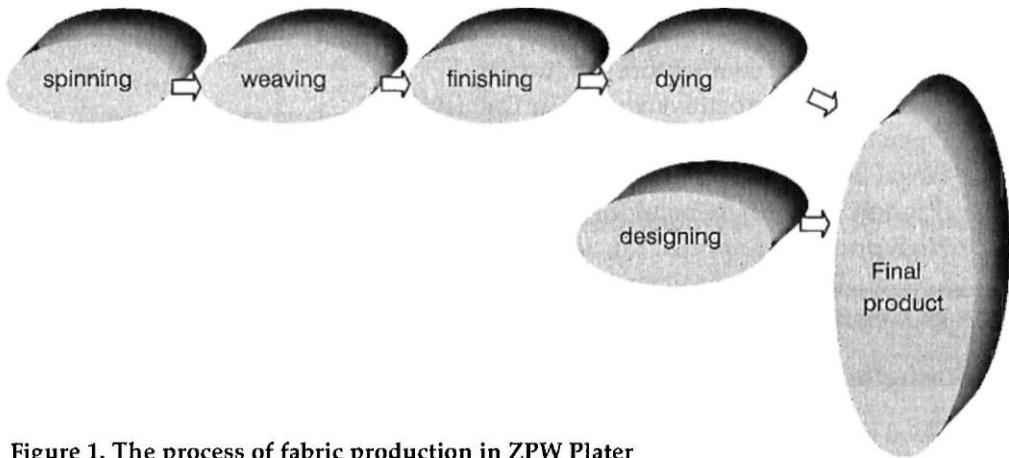
4. Finishing – raw fabric is washed, dried, than combed, pressed, eventually darned, combed again, folded and transported to dyeing rooms.

5. Dyeing – raw fabric is put into big containers together with dyeing components mixed with water. The containers are closed under a huge pressure and fabric is dyed. Then a fabric is washed and dried. At the end is pressed and cut into pieces.

6. Designing – the enterprise has its own designing department where new colours, textures and designs are made. Out of 60 new designed proposed each season, about 3 are finally produced.

Plater is a typically vertical integrated enterprise that runs all the steps of fabric production – from raw wool to finished fabric ready to sell.

**Resources used.** Raw materials used for production process are both domestic (nearly 60%) and foreign. Basic raw materials are wool, polyester and viscose. The enterprise buys raw, washed wool from firms that are specialised in washing and preparing raw wool domestic and foreign (mainly from former USSR countries). Man-made yarns are bought directly form the producers and synthetic yarn – through wholesaler.<sup>2</sup> Dyeing components are bought directly from the producers or middleman.



**Figure 1. The process of fabric production in ZPW Plater**

**Level of technology.** The majority of ZPW Plater machines and equipment is old and of low productivity. The level of machinery worn out is high. Basic machinery is depreciated in nearly 100%.

**Approach to planning.** Strategic decisions for Plater are: what should be the assortment produced (that would meet the demand from the clients and also would respond for rapidly changing fashion), for what markets (domestic, foreign, both), how should be sold (through wholesalers, middleman or directly). For medium term planning managers has to forecast and plan the quantity of the production, try to estimate the demand for different types of fabrics. Good valuation of raw materials needed and capacity to be used would also be essential.

Short term plans, are more detailed and connected with the day to day operation of the enterprise. That is day to day quality control, resource scheduling and other.

## SWOT analysis

### Opportunities

- Fashion for natural wool fabrics
- The decline of OPT in big, well known garment producers, that will certainly give the space on the market for Polish fabric producers
- The rise of interest in domestic sales of big Polish garment producers
- Lot of small but profitable garment producers
- Free access to foreign markets where the level of garment consumption is high

### Threats

- Strong competition of imported fabrics
- Tariff protection for domestic raw wool producers

- General decline in demand for wool fabrics of lower quality
- Substitution of other natural fabrics
- High quality of competitors production
- Strong price competitiveness of Far East fabrics
- Open borders for high quality fabrics from western countries
- Illegal import
- Strongly seasonal demand for wool fabrics
- High prices for imported raw wool
- Low quality of domestic synthetic and man-made fibres
- ISO regulations in many Polish domestic wool fabric producers

### **Strengths**

- Good localisation near Ukraine border
- Vertical integration – spinning, weaving, finishing and dyeing departments
- Good rebate policy
- Good relations with the group of stable, confident clients
- Possibility of fighting seasonal demand by the production of non-garment fabrics
- High quality of the top management
- Know how in the production of linen fabrics
- Own retail shop

### **Weaknesses**

- Location – far from the centres of garment producers
- The lack of high quality fabrics in the offer
- Low standard of produced fabrics (generally they are too thick)
- The lack of good relations with the best Polish garment producers
- Low competitiveness in technology (spinning and weaving machines are old, dyeing department needs some new equipment)
  - Difficulties in keeping high finishing standards due to insufficient equipment
  - Big number of small clients that represent fluctuating demand
  - Lack of long term agreement for co-operation with big garment producers
  - Long production process

The problems that an enterprise has to face are listed above as weaknesses. My intent is to solve one of them – that is to ameliorate product quality and built distinctive competence of enterprise. That can be done through the change in the production process. The main changes would be implementation of the production of semi-worsted fabrics (thinner, lighter, better quality) and production of new blended fabrics with higher quality woollen yarn. I do believe that this would positively influence the enterprise competitive position and would be a good starting point for the

successful competition on the market. Wool fabric producer Plater has several problems to overcome. Generally they can be presented as follows:

#### 1. Product

- The lack of high quality fabrics in the offer
- Low standard of produced fabrics (generally they are too thick)

#### 2. Production technology

- Low competitiveness in technology – spinning and weaving machines are old, dyeing department needs some new equipment
- Difficulties in keeping high finishing standards due to insufficient equipment

#### 3. Process

- Long production process

#### 4. Demand

- Big number of small clients that represent fluctuating demand
- Generally seasonal demand for the product
- Decline of the demand due to the change of customers preferences and the shift from lower end products to higher quality products

#### 5. Distribution

- The lack of good relations with the best Polish garment producers
- Lack of long term agreement for co-operation with big garment producers

I believe that a key issue to be solved is product quality, as this is the main factor that decides about the future performance of the enterprise. Wool fabric quality rather than price is the most important feature that influence sales.

In the total Plater sales, the share of outer garment fabrics, suits fabrics and costume fabrics increase systematically. In order to strengthen this tendency, Plater would have to launch new thinner semi-worsted fabrics. It is not possible without the implementation of the new process in the enterprise.

The change seems inevitable, otherwise Plater will systematically lose its market share and “stuck in the middle”, as its production is too expensive for the lower end of the market and of too low quality for the upper end.

### Details of fabric production process

Production of the fabric is a typical batch production. It needs specialised equipment and rather skilled work force, as there are a number of frequent set-ups and changes. There are four major operations in the fabric production process – spinning, weaving, dyeing and finishing.

**Spinning.** At spinning department there are four major operations: Preparation – blending and tearing of raw wool, 10 workers on 3 shifts; Carding – roving preparation, 5 employees on 3 shifts; Spinning – yarn production, 8 employees on 3 shifts; Finishing – rewinding and twisting, 18 employees. Total employment (managers and other staff) is 115. Equipment at this department has been bought in the late 60's. The

machinery construction needs intervention of work force at every stage of the operation. This largely increases the possibility of failures in the production process. There is no automation, computers or any electronic devices than can control the operations. Process is fully mechanical. Equipment is worn out in nearly 90% that is why the quality and also productivity can not be increased. In order to maintain the production process last year modernisation had been made, but this did not largely influence the product quality.

**Weaving.** In the weaving department there are 120 MAV looms. They were installed in 1973/74. At the moment their construction is old and not efficient according to the standards. They are worn out. Due to the capital shortages there were no capital repairs. Spare parts were taken from totally worn out machines and recuperated. This lowered the repairing costs, but adversely affected the standard of produced fabric, as the operations were not that accurate as they should.

Weaver is able to serve 4 looms. This assures the quality of the fabric. Looms do not have any electronic devices that would supervise the process. In order to increase the production, there is a need of additional workforce; otherwise number of faults largely increase.

With MAV looms its is not possible to produce thin fabrics of lower tex then 64. Looms do not have fabric length counters. It increases the amount of waste products, and affects the finishing. Cost of weaving department employees constitutes a huge percent of the fabric price.

Plater weaving department can produce two types of fabric – woollen of tex not lower then 64 and worsted – very basic considering blended yarn. There are several operations in the weaving department, such as: rewinding, steaming, gluing, warping, weaving, quality control of raw fabric, mending and dispatching to the next department. Total workforce at the department – 63 employees.

**Dying.** All the equipment at this department has been installed in the early 70's. Machines are worn out and all have mechanical steering. This is not efficient and needs a high number of employees. The quality of fabric colour depends on the workforce skills and they experience. All the equipment from the moment of the installation has not been modernised. Operations at this department are – dying, rinsing, drying, and pressing. Total number of employees – 16.

**Finishing.** Finishing department can realise operations such as washing, boiling, drying, mending, teaselling, shearing, pressing, decating, folding, list mending, brushing. Equipment at this department is worn out, but can assure the needed quality of the final product. This department is a potential bottleneck for the whole process, as some of the equipment (especially shearing machine) are old and can stop practically at any time of the operation. Lately some new equipment has been bought (washer and decating machinery). This largely increases the quality of the final product.

Table 1. Description of new and old fabric production process in Plater

No	Description	Operation	Move- ment	Inspection	Delay	Storage	Time (h)	Distance (m)
	SPINNING	OLD PROCESS						
1	preparation	blending	YES	YES	YES	NO	2	-
2		tearing	YES	YES	NO	NO	4	-
3	carding	Roving preparation	YES	YES	NO	NO	67	-
4	spinning	Yarn production	YES	YES	NO	NO	67	-
5	finishing	rewinding	YES	YES	NO	NO	8	-
6		twisting	YES	YES	NO	NO	16	-
		TOTAL	6	6	1	0	166	0
	SPINNING	NEW PROCESS						
1	preparation	blending	YES	YES	YES	NO	2	
2		tearing	X	X	X	NO		
3	carding	Roving preparation	YES	YES	NO	NO	24	
4	spinning	Yarn production	YES	YES	NO	NO	24	
5	finishing	rewinding	X	X	X	NO	X	
6		twisting	YES	YES	NO	NO	12	
		TOTAL	4	4	1	0	62	0
	WEAVING	OLD PROCESS						
7		rewinding	YES	YES	NO	NO	1	25
8		steaming	YES	YES	NO	NO	1	25
9		gluing	YES	YES	NO	NO	1,5	25
10		warping	YES	YES	YES	NO	4	25
11		weaving	YES	YES	NO	NO	40	
12		Raw fabric quality control	YES	YES	NO	NO	3	
13		mending	YES	YES	NO	NO	3	
14		dispatching	YES	YES	NO	NO	-	100
		TOTAL	8	8	1	0	53,5	200
	WEAVING	NEW PROCESS						
7		rewinding	YES	YES	NO	NO	1	
8		steaming	YES	YES	NO	NO	1	
9		gluing	YES	YES	NO	NO	1,5	
10		warping	YES	YES	YES	NO	4	
11		weaving	YES	YES	NO	NO	10	
12		Raw fabric quality control	YES	YES	NO	NO	3	
13		mending	YES	YES	NO	NO	0,5	
14		dispatching	YES	YES	NO	NO	-	100
		TOTAL	8	8	1	0	21	200
	DYING	OLD PROCESS						
15		dying	YES	YES	YES	NO	4	

16		rinsing	YES	YES	YES	NO	0,5	
17		drying	YES	YES	NO	NO	2	
18		pressing	YES	YES	YES	NO	2	
		TOTAL	4	4	3	0	8,5	0
	DYING	NEW PROCESS						
15		dying	YES	YES	YES	NO	4	
16		rinsing	YES	YES	YES	NO	0,5	
17		drying	YES	YES	NO	NO	2	
18		pressing	YES	YES	YES	NO	2	
		TOTAL	4	4	3	0	8,5	0
	FINISHING	OLD PROCESS						
19		washing	YES	YES	YES	NO	4	
20		drying	YES	YES	NO	NO	2,5	
21		teaselling	YES	YES	YES	NO	8	
22		shearing	YES	YES	NO	NO	2,5	
23		pressing	YES	YES	NO	NO	2,5	
24		decating	YES	YES	YES	NO	8	
25		folding	YES	YES	NO	NO	2,5	
26		List mending	YES	YES	YES	NO	4	
27		brushing	YES	YES	NO	NO	2,5	
		TOTAL	9	9	4	0	36,5	0
	FINISHING	NEW PROCESS						
19		washing	YES	YES	YES	NO	4	
20		drying	YES	YES	NO	NO	2,5	
21		teaselling	YES	YES	YES	NO	8	
22		shearing	YES	YES	NO	NO	2,5	
23		pressing	YES	YES	NO	NO	2,5	
24		decating	YES	YES	YES	NO	8	
25		folding	YES	YES	NO	NO	2,5	
26		List mending	YES	YES	YES	NO	4	
27		brushing	YES	YES	NO	NO	2,5	
		TOTAL	9	9	4	0	36,5	0

Source: The data obtained in the Plater enterprise.

**Quality control of the process and product.** Plater conducts traditional quality control – that is process control. Inspections take place during the process, but also raw materials and finished products are carefully checked. Faults of fabrics usually come from human errors, as the equipment is not computerised.

Production process in the enterprise is conducted according to the technology conditions set up by internal technical department. Those conditions are then split into instructions for different technological operations and parameters that all the semi products should meet. The quality control staff registers each operation done in accordance to the instruction.

Raw materials, yarn raw fabric and finished fabric are checked and compared with set up parameters. The results are registered. The enterprise has the separate laboratory where the quality is carefully checked. Product that does not meet parameters and norms is signed and withdraw from the production.

Quality control teams besides regular process monitoring conducted at regular intervals, do also controlling of the process. They focus on the quality of workforce work, quality of operations in the process and the quality of the product. The results of monitoring and controlling are registered. This is the base for the elimination of the situations where the quality of product, work or process does not meet parameters or norms.

Quality control takes place at all stages of the production. In the weaving department quality of raw fabric is checked but faults of yarn and raw fabric are not very often. In the dyeing and finishing departments all operations are strictly monitored as those stages largely influence the final product quality. Faults (that are stains, not equally coloured fabric, etc) are registered and the fabric is either withdraws from the production or classified as of lower quality. More than 95% of Plater production is classified as first class production (in accordance with the enterprise and Polish norms).

### **Causes and effects of the problem with production process**

Nowadays rapid change in fabric production technology caused a huge improvement of the quality and design of fabrics. Modern fabrics are blended of different synthetic and man made yarns also casmir and others.

Quality of raw materials, technology of spinning, technology of weaving and technology of finishing and dyeing are the factors that mainly influence the fabric quality.

Technological level of the equipment is the direct factor that decides of fabric quality. Garment and also fabrics are the products of fashion – which is of very short life cycle.

Market position of fabric producer depends on its quick response for all new trends in fashion. Imported fabrics adversely affect Plater sales.

There are three main reasons why garment producers prefer imported fabrics:

1. **Higher quality** – the quality of imported fabrics is much higher because they have blended yarn of new generation, thinner and of higher than average quality. Yarn of this type is accessible on the market but Plater doesn't have technology to use such yarn and produce similar fabrics.

2. **More attractive design** – fashion changes very often and fabric producers have to respond very quickly for the changing demand. Plater as all other Polish fabric

producers can be only the follower. But even to be the follower on this rapidly changing market, computerised design department is a necessity.

**3. Better market responsiveness** – big garment producers in order to be competitive have to prepare their collections far before the beginning of the season. Fabric producers have to shorten the time of the production process and deliver the products as fast as they can. The better and modern the production line is, the faster delivery.

Plater is not competitive either in the upper end products as has lower quality and worse design than western producers nor in the lowest end products as is more expensive than far east imported fabrics.

### **Alternative ways of overcoming the problem**

There are three main ways that Plater can choose:

**WAY 1 – maintain the old technology and process.** Plater can maintain its technology and process and ameliorate quality control. This option will leave the core operations unchanged, only some improvements in planning can be made. In the short term this solution is acceptable, as the enterprise market position is rather stable.

But the majority of Plater machines and equipment is old and of low productivity. The level of machinery worn out is high. Basic machinery is depreciated in nearly 100%. Due to the lack of funds capital modernisation had not been done. It is very probable that in the nearest future machinery would not be able to produce fabrics even at the average quality.

**WAY 2 – ameliorate technology and adjust the process.** In this case Plater would have to buy the most needed machinery, especially for the finishing department, as this is the stage of operation that mostly influence the fabric quality. Also some minor changes in the spinning, weaving and dyeing department are advisable. The core process would remain unchanged, although new investments would influence better performance. This alternative does not permit Plater to produce semi-worsted fabric – that is change the assortment and radically increase quality. Capital cost – additional equipment, 1 mln USD. Time – 6 months from order to machinery installation. Staff – unchanged.

**WAY 3 – change of technology and change of the process.** The third way seems to be the best, but also the most expensive. Plater would have to set up a new line in the spinning and weaving department and adjust equipment in the dyeing and finishing. Yarn can be divided into worsted and woollen. Worsted is thinner and has tex till 36. Woollen yarn is thick and has tex beginning of 64. In between there is semi-worsted yarn – from 36 tex till 64 tex. In order to produce semi worsted yarn a new technological line has to be set up. This would let Plater strongly ameliorate quality of the product. Productivity would also increase. It would be inevitable to adjust all the infrastructure of the enterprise and considerably lower the number of employees, especially in the spinning department. Remaining work force would have to be trained.

Together with this change of process the production of semi-worsted fabrics (thinner, lighter, better quality) and new blended fabrics with higher quality woollen yarn would be possible.

I strongly believe that this would positively influence the enterprise competitive position and would be a good starting point for the successful competition on the market. Capital cost – production machines 6 mln USD. Operating costs – depreciation increase by 4%, also increase of promotion costs. Time – 12 months from the order till installation

**Table 2. VRIO analysis (Valuable, Rare, Difficult to Imitate, Well Organised Resources)**

Is the technology and process:

Valuable	Rare	Difficult	Well to imitate	Competitive organised	Performance advantage
Old technology and old process					
no	no	no	To some extend yes	Competitive disadvantage	Worse than competitors
Some new technology, adjustments in the process					
yes	no	no	yes	Competitive parity (with foreign competitors) slight competitive advantage (with domestic producers)	Like competitors Better than competitors
New technology, new process					
yes	yes	yes	yes	Sustained competitive advantage	Better than both domestic and foreign competitors

Source: Own, based on the data obtained in the Plater enterprise.

### Views of the most appropriate way and findings implementation

Changes on the fabric market are very rapid and have to be followed by the change of technologies and operations that can ameliorate effectiveness of fabric's production.

In the 90's several Polish fabric producers disappeared from the market due to the strong and increasing competition of foreign fabric producers. The overall production level diminished, import increased. This is caused by low effectiveness and low elasticity of Polish fabric producers.

Plater enterprise is very typical example of an average Polish wool fabric producer. The product is at satisfactory quality, but for lower end users. The market chan-

ges and shifts to the upper end products. Inevitably in the long run Plater would have to adjust to those changes, that is ameliorate its performance.

It is obvious that change of the process and change of the technology would be the best way to overcome all the Plater problems. With world standard fabric it would compete not only on the domestic market but may be also on the foreign ones. Such a change would build sustained competitive advantage of the enterprise.

**Spinning department.** New line for semi worsted fabric production should be bought. In order to increase productivity remaining equipment should have capital repair.

The biggest problem in this department is the fact that the most precise operations, that are workforce supervises the introduction of raw wool into the machine, not by electronic devices.

Raw materials that enter the equipment should always be of the same weight, without automation workforce skills decide about it. Another problem is that there are 2 carding machines, where raw wool goes through, and those also are the weak points of the whole process. Also the equipment is not well prepared to produce yarn of lower than 64 tex. Theoretically it is possible, but the yarn is weak and not constantly of the same tex.

New equipment is fully controlled by the computer. Computerised equipment does serious of operation without interruption. There is only one carding machine, instead of two, so the possibility of failure declines. Raw material is electronically weighted. Computer aided manufacturing allow the enterprise to produce rather small batches of production at lower costs. Each change of the product in the production takes now approximately 8 hours, as all the equipment is manually controlled.

The old process takes now 166 hours, the new one only 62. There would be 4 instead of 6 operations. Flexibility of process increases. Flexibility of the production and the possibility of production of small batches of product are very important especially for fabric producer. The cost of modernisation would reach 3,5 mln USD.

**Weaving department.** The new looms should replace the old ones. 30 new generation looms would replace 120 of the old generation. New looms are 3 times more efficient then the old ones. The computer supervises the whole operation. The efficiency is higher as the looms can work without weaver interruptions. Fabric length can be easily measured so the waste number is much smaller. All the looms are centrally lubricated. The expenses on spare parts and repairs are reduced. Other equipment in the department can remain unchanged. The old process takes nearly 54 hours, the new one only 21. The cost of modernisation would reach 1 mln USD.

**Dyeing department.** Due to the change of production process also the dyeing department must be modernised. In the old technology the fabric has been dyed. In the new technology white yarn would be produced and dyed before weaving.

Present machinery can be adapted to this requirement, but together with this modernisation a capital repair would be required. This would be very costly.

Yarn dyeing is the most technologically difficult operation in fabric production. It needs high standard, computerised equipment, that is why Plater need to buy new

dye, fully automated, in order to well control the operation. Together with this investment new drier would have to be bought. The cost of modernisation would reach 0,5 mln USD.

**Finishing department.** New semi worsted fabric can not be finished in the same way as worsted fabric. Plater simply hasn't these types of equipment. The cost of modernisation would reach 1 mln USD. In the table below I present the comparison of both, new and old process, regarding output and workforce required.

**Table 3. Comparison of the old and new process of fabric production**

	OLD PROCESS	NEW PROCESS
Spinning output	3 000 kg / 24 h	5 000 kg / 24 h
employees	115	30
Weaving output	5000 rm. / 24 h* (3 000 kg / 24 h)	10 000 rm. / 24 h* (5 000 kg / 24 h)
employees	63	62
Dyeing output	4 000 kg / 24 h	4 000 kg / 8 h (12 000 kg / 24 h)
employees	16	16
Finishing output	5000 rm. / 24 h (3 000 kg / 24 h)	10 000 rm. / 24 h* (5 000 kg / 24 h)
employees	54	54
TOTAL EMPLOYEES	248	162
TOTAL TIME	264,5 HOURS	122 HOURS

\*5000 rm. x 0,6 kg / rm. = 3 000 kg

\*\*10 000 rm. x 0,5 kg / rm. = 5 000 kg

Source: As for the Table 1.

Table shows that the output of the old process is two times lower then the old one. In the old process there is far more employees needed, especially at spinning department. There would be a big employee's reduction – from 115 to 30. In other departments the number of employees remains unchanged.

Both processes in theory can go very smoothly, there is no bottlenecks. In the new process there would be over capacity in the dyeing department.

## Problems

There would be technological, organisational and economic effects connected with this investment. The main problem is the cost of the investment, estimated at 6 mln USD. Enterprise can not finance the modernisation without the financial aid from the outside. Plater present financial situation is not strong enough to pay interest of commercial loans. Enterprise would have to look for investor.

Planned investments will increase depreciation level by 4% a year. The cost of wages will decrease, but due to inevitable workforce reduction. 86 direct production employees out of 248 would be discharged.

### Measurement of the performance of the operations

There are different measures of performance that can be applied. Here I present three of them:

- Production level
- Market share
- Labour productivity

Plater production, after the implementation of the new process will largely increase. The projection is base on the historical analogy. We assume that in 2001, after the process implementation the production will nearly double this of the year 2000, and in the next 6 years will grow, but at the more stable pace (Table 4)

**Table 4. Projection of Plater sales till year 2007**

Product	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
semi worsted	133	151	245	270	1170	1250	1300	1350	1350	1350	1350
costume fabric	536	503	515	535	785	785	785	785	785	785	785
shirt fabric	436	386	310	310	495	495	495	495	495	495	495
suit fabric	28	93	85	100	350	350	350	350	350	350	350
shoes fabric	27	60	45	60	100	100	100	100	100	100	100
decoration fabric	4	2	0	0	0	0	0	0	0	0	0
pleads	101	40	130	180	150	150	150	150	150	150	150
export	508	527	440	435	450	470	470	470	470	470	470
overall Plater sales	1773	1762	1770	1890	3500	3600	3650	3700	3700	3700	3700
Polish sold production	23599	26120	21200	23640	23653	22831	23375	23286	23164	23275	23242
Plater share in the domestic market	0,08	0,07	0,08	0,08	0,15	0,16	0,16	0,16	0,16	0,16	0,16

Source: As for the Table 1.

In order to estimate later market share level of Polish sold production has to be estimated. Last year it reached, mainly due to the decline of former USSR markets, it's lowest then ever point.

For the next year I estimate the growth, but at moderate paste. This situation is good for Plater, as its market share will grow thanks to its production increase and also the decline of the whole market.

**Table 5. Labour productivity in the old and new process in Plater**

OLD PROCESS	NEW PROCESS
Output: 5 000 rm. / 24h	Output: 10 000 rm. / 24 h
Employment – 248	Employment – 162
Labour productivity	Labour productivity
20,16 rm. / person / 24 h	61,73 rm. / person / 24 h

Source: As for the Table 1.

It is very clear that the new process is more efficient. With the total workforce reduced by 86 persons, that is by one third, the workforce productivity tripled.

### Ways of improving performance

The new process will inevitably influence Plater performance. I think that the change of operation in the process would be the good starting point for other changes in the enterprise.

I think that Plater would have to benchmark with similar fabric producer from western country. This would probably bring managers the ideas how others organise similar operations.

Another important step would be to ameliorate and fully computerised the designing department. Tighter contacts with big garment producers and co-operation will help Plater to find fashionable and modern designs.

It would also be advisable to emphasis on time. Especially in this sector this is a crucial factor influencing enterprise competitiveness. Another issue that managers should think about is the quality control management. The first step would be ISO standards implementation; the second one may be TQM.

I would like to underline that this technological change is just the beginning of improving performance. This shows a good way, but is not enough to assure the enterprise a stable market position, especially in a rapidly changing textile sector.

### Benefits expected

Plater would be able to produce high quality fabric at the competitive price comparing the imported products. Fabrics would be of better design. Production process would be far shorter, that means the elasticity of deliveries. The time of the process would be reduced from 264 hours to 122.

We can assume that excluding all other factors, this will be followed by the increase of orders from the big garment producers.

At present the demand from this group of client's represent barely 12% of the whole sales. Those are the most important clients, as the co-operation is based on the

long-term agreements. In the sector where product life cycle is so short, this can largely reduce the demand fluctuation.

Plater should considerably increase its market share. We can estimate that Plater share in the year 2001 would increase to 17%<sup>3</sup> of the total Polish sold production of wool fabrics. Plater would become a market leader. That means good financial standing and high profits for potential investors.

Generally, thanks to the new technology and higher product quality Plater would be able to solve all other problems that were listed at the beginning of my report.

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### Notes

- <sup>1</sup> We can divide wool fabrics into two main groups – woollen wool fabrics – thicker, for outer garments, pleads, car upholstery, uniforms and worsted wool fabrics – thinner, from better quality wool – mainly used for suits, dresses, costumes.
- <sup>2</sup> Synthetic yarn (fabric) like viscose, cupro or modal are made out of celuloze , while man made yarn (fabric) like polyester, nylon, lycra are obtained from non organic raw materials.
- <sup>3</sup> This is the share in the Polish domestic market without import. Statistical data for wool fabric import to Poland are not widely accessible.