International Trade Centre

TRADE IMPACT FOR GOOD

Part I: FROM JOB COSTING to END-TO-END COST SHEET

Webinar

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The problem with the Basic cost sheet

Basic Costsheet		
	PCT of FOB	Cost
Material Fabric	60.0%	$6.00
Material Trim	10.0%	$1.00
CM Labour	6.4%	$0.64
CM Overhead	18.6%	$1.86
CM Total Cost	25.0%	$2.50
Total Cost	95.0%	$9.50
Factory Profit	5.0%	$0.50
Total FOB Cost		$10.00

The basic cost sheet serves little purpose
Your customer does not care about your costs
He cares only about his costs, your FOB price
He will not pay you more just because you costs are higher
The basic cost sheet does not help you, the factory
Because it was prepared at the outset of the process and is based entirely on estimates
You will not know the true costs until the completed and shipped
And you have prepared the JOB COSTING

Job Costing: Fabric

In real life, there are difficulties with each cost item. Let's look first at the fabric where there are two interrelated problems. How does a factory account for leftover fabric? For example, 50,000 meters were delivered and after cutting all orders for that fabric, there are 600 meters left. The factory initially has two choices:

a. Add the leftover fabric to the fabric costs of the various styles on a pro rata basis;
b. Add the additional fabric to inventory thus listing the fabric as an asset.

To make a rational decision, you have to look at the fabric type.

a. If the fabric is 125g white jersey and the factory's business is T-shirts, of course the leftover fabric can be added to your inventory because it has value.
b. If the fabric is chartreuse rayon shirting with puce polka dots which no future customer is likely to want, the factory has no choice but to add a pro rata cost to each unit produced.

Fabric: Joint Cost Problem

The second issue is how to prorate the added cost of fabric among the styles because it has value.

This is the basic JOINT COST PROBLEM.

There are again two choices:

A. Apportion the cost of the fabric on the basis of consumption;

Total order 200 pieces each style

100 meters left over

2 styles.

a. coat that consumed 3m
b. Trousers that consumed 1.5

You would allocate as follows

Coat 67m

67/200 = 3.33m

Trousers 33m

33/200 =1.665

Fabric: Joint Cost Problem (Cont)

B. Apportion the cost of the fabric on the basis of FOB price

For example,

Coat FOB price $30

Trouser FOB price $10

Allocate as follows

Coat 75m/200 = 3.375m

Trousers 25/200 = 1.625m

Because joint-cost-problems have no mathematical solution, it matters little whether you follow solution A or solution B

Provided you are consistent (always follow A or always follow B

Job Costing : Trim

Trim costing is more straightforward.

While joint cost problems involving fabric are relatively unusual, those involving trim are extremely common and complicated.

With the possible exception of customer's labels, the cost of all purchased trim should be applied to the order.

The leftover trim should not be included in inventory for accounting purposes because if it included for accounting purposes, old trim becomes an asset and adds to profit. The more old trim you have, the greater your profit?

However it does exist and might be usable for future orders.

NB: Before ordering trim for any order, we should first check existing inventory and subtract the in-house quantities from any new trim orders

Job Costing: Calculating Labor

For costing purposes, we define labor as wages and benefits paid to workers who are directly involved in the production process

Cutters

Bundlers

Sewers

Inspectors

Pressers

Packers

NB: This does not include supervisors who are classified as staff and are therefore included in overhead.

Labor Calculation

Sewing labor cost for each style is calculated by the number of minutes required to produce one garment of that style times the worker's wage per minute

Calculating minutes per piece is relatively easy. We require only the following information

a. Number of machines in the line.
b. Number of working days factoring in overtime
c. Number of pieces in the order

Style XYZ requires 38.4 sewing minutes per piece. This is an important piece of information

From the factory side:

Necessary to determine garment cost:
Necessary to determine changes in productivity
Necessary to determine factory schedule and capacity

Labor Calculating Minutes Per Unit

To produce 10,000 pieces of Style XYZ, a 40-machine line requires 20 days

Days	Hours	Minutes	Line	Units
20	8	60	40	10,000
	160	9,600	384,000	38.4

at an average of 8 working hours per-day = 38.4 minutes

Labor: Calculating Sewing Cost per unit

Labor cost for each style is calculated by the number of minutes required to produce one garment

of that style times the worker's wage per minute

A worker paid $150 per month

= $0.011 per minute

= $0.41 for a garment requiring 38.4 minutes

Direct Labor Sewing				
Per Month	Per Day	Per Hour	Per Minute	No. Minutes
	26 days	9 Hours	60 per hour	38.4 Sewing Time
$150	$5.77	$0.64	$0.011	$0.41

Labor: Calculating other factors

However, there is one more factor: Down-time due to line balancing.
An assembly-line reduces the production into a series of discrete steps.
The goal is to have a steady flow without bottlenecks and/or stoppages.
Because the number of minutes required differs from one step to another,
we cannot simply allocate one worker to each step. For example,
Step A requiring 2 minutes requires 4-times the work as step B requiring ½ minute.
To keep a steady flow the line manager must stop work to balance the line
while machines are changed and new workers assignments are made.
Typically, a factory will plan to start producing the new style at a point
coinciding with normal operation stoppages
— after lunch or another break, or most often at the beginning of the work day.
A well run factory will require half a day for line balancing.
As we can see from the chart below the time lost for a 10,000-piece order
is slightly less than 1 minute per unit or 2.5%

Days	Hours	Minutes	Line	Units
20.5	8	60	40	10,000
	164	9840	393600	39.36

Labor: Down Time

Let us consider the down-time loss for a smaller order,

bearing in mind that line balancing remains unaffected by order size.

From the chart below, we can see

the same style XYZ will require 3 days to produce 1500 at the rate of 38.4 minutes per piece

Days	Hours	Minutes	Line	Units
3	8	60	40	1,500
	24	1440	57600	38.4

Labor Down Time (cont)

When we add, the down time the results are far different.

Where the 10,000-piece order loses than 1 minute or 2.5%. The 1500-piece order losses of 6.4 minute or 16.7%

Days	Hours	Minutes	Line	Units
3.5	8	60	40	1,500
	28	1680	67200	44.8

Labor Other Hidden Factors

There are other hidden factors:

a. Introducing a new style in a line does not mean that 40 machines start work at once. Work begins at step 1 and over a period of time moves through the line to the point where all forty machines are operating.

b. The learning curve: Sewers need time to adapt to the new style during which productivity is reduced.

Once again, the actual time lost is unrelated to the size of the order.

One point is clear, we cannot effectively produce 1500 garments in a 40-machine line. Not only are the cost prohibitive, but as we will see below line balancing my no longer be possible.

Labor: Line Balancing

How do we balance the line?

100 years ago, line balancing simply meant adding a greater number of sewers to the more difficult operations. In the example above, Step A would require 4 sewers while step B would require but a single sewer. This line-balancing method required the ability to determine the number of minutes necessary for each step. Not only was this inefficient but failed to take into consideration the hidden factors listed above.

Today, successful factories no longer think of their sewers as automatons but rather as people. Line supervisors categorize their sewers into A-B-C classifications. Rather then throwing 4 bodies at step A, the supervisor would allocate 2 class A sewers. Furthermore, the best line supervisors will provide on-the-job training to raise the standards of his line.

Management will bring in qualified engineers to introduce new production techniques not only to train workers but also supervisors for the entire factory Almost all contemporary production techniques are based on worker empowerment.

Labor: Line Balancing (cont)

All of this brings us to the point where line balancing eventually becomes impossible. As a factory trades up from commodities to fashion goods and lower value-added to higher value-added products, the size of the order diminishes and with it the size of the line. At some point, usually at about 20 machines the line can no longer be balanced because we cannot assign 1½ sewers to an operation. Or can we?

The short answer is we can assign a half worker. This is called multi-tasking, where each sewer carries out several steps. At this point the single tasked line is replaced by a multi-tasked team, where 25+ operations are carried out by 8-12 sewers. The team can operate effectively only when they are totally empowered. In successful operations the team itself decides which steps to carried out by each worker. They recognize that people are individuals with different skill sets and the team wants to assign each worker the operations they are most qualified to carry out. In a sense, the team becomes an independent contractor that makes use of the factory space and equipment. No more line supervisors because there are no more lines. The factory management cares only about quality.

From Sewing Cost Per Unit to Total Labor Cost Per Unit

As shown above, we also have other direct labor

Cutters

Bundlers

Sewers

Inspectors

Pressers

Packers

The factory's account department has records of total wages for the designated period. To find the cost per unit for ancillary labor, we need only determine what percent of total wages is sewing. If, for example, wages for the period totaled $1000 of which sewers received $667, then we know that sewing equals 2/3 of total wages. Therefore if the sewing cost per unit for a particular order equals $1.00 then cost per unit for ancillary labor would equal $0.50 and total wages per piece for that order would equal $1.50

Job Costing : Overhead

There are two problems here:

1. Breaking down overhead: As we have seen above, the factory's account department can provide data for total overhead for the period. The problem is how to break down total overhead to overhead-per-piece. The simplest and most practical solution is to relate overhead cost to labor. We know that the more difficult styles take longer than the easy styles and therefore the overhead should be greater. Labor cost per unit also reflects the degree of difficulty. Therefore we can calculate overhead as a proportion of labor.
2. Seasonality: This is a more complex problem. A factory is a closed-room operation where there is a maximum level of production. At some point the production reaches 100% of capacity. At the same time, because our industry operates on a seasonal basis, there are months when production falls below capacity. Therefore, the annual average must be less than 100% of capacity soi we cannot base overhead on 100% capacity.
    a. Working with the account department, the factory can come up with a reasonable estimate for overall annual capacity. A reasonable overall annual figure might be 70%. section
    b. Keeping the job costing as is. This will still show the profit (or loss) for each style, but will not show the total profit (or loss) for the company. Therefore, when carrying out profit and loss statements, we have to calculate the ratio of total overhead for each month against total overhead for all job costings for the month and increase overhead accordingly

Job Costing: Case Study Job Costing:

This is one of most important tools in our cost to value tool-box.
Because it is created at the beginning of the process,
the cost sheet is at best an inaccurate estimate of the style's per unit cost.
We can only know the real cost after the order has been produced.

Case Study: Basic Costsheet vs Job Costing					
The factory has an order for 10,000 pieces.					
Basic Costing: 10,000 piece					
Material	60%	$60,000			
Trim	10%	$10,000			
CM	30%	$30,000	CM Breakdown		
FOB	100%	$100,000	Labor	$6,410.26	
			Overhead	$18,589.74	2.9
Total Cost		$95,000			
Total Revenue		$100,000			
Net Profit	5.00%	$5,000			

Job Costing vs Basic Cost Sheet

Case Study: Basic Costsheet vs Job Costing					
The factory has an order for 10,000 pieces.					
Basic Costing: 10,000 piece					
Fabric	60%	$60,000			
Trim	10%	$10,000			
CM	30%	$30,000	CM Breakdown		
FOB	100%	$100,000	Labor	$6,410.26	
			Overhead	$18,589.74	2.9
Total Cost		$95,000			
Total Revenue		$100,000			
Net Profit	5.00%	$5,000			
However, the job costing tells a different story					
JOB Costing: 10,000 pieces					
Material	60%	$61,000			
Trim	10%	$9,300			
			Labor	$6,169.88	
			Overhead	$22,307.69	
Total Cost		$98,778			
Total Revenue		$99,300			
Net Profit	0.53%	$522			

Job Costing 8: Sample Job Costing: Notes

Fabric: The factory ordered 30,000 meters of our well-known chartreuse shirting with puce polka dots, but received 30,500 meters. Since the additional 500 meters is well within the accepted range deviation, the factory accepted the goods Rather than cutting the additional fabric (which they under the normal contract allowing for 3% over-shipment they were entitled to do), the outstanding 500 meters was written off.
Trim: The factory enjoyed a 7% savings because the cost of the trim taken from stock from stock was greater than the cost of the trim overage, which was written off.
Labour: Here again the factory did well. The costing listed production time at 40 SAM, but the actual production time was 38.5 SAM
Overhead. This was the big loss. The costing was based $1.86 per unit (2.9 times labor) but due to the fact that the order was produced during a slow period when total orders were less than capacity, the overhead increased from $1.86 per unit to $2.23 per unit. This is a common problem in any seasonal industry. The total overhead does not relate to the number of units produced (you pay the same rent even if you produce 0 garments). As a result the overhead per unit rises as he number of units produced falls. The factory can overcome this by making a provision in its overhead calculation.
Total Revenue: 10000 pieces cut but only 9930 shipped with the result that total revenue was reduced from $100,000 to $99,300

Job Costing : Benefit
Which Customer Provides the Greatest Profit

Net Profit by Customer by Period			
Customer Name	Total Sales	Gross Profit	Net Profit
Able	$1,000	12.5%	4.0%
Baker	$800	30.0%	12.0%
Charley	$700	20.0%	6.0%
Delta	$550	5.0%	-3.0%
Echo	$400	16.0%	1.0%
Frank	$320	16.0%	2.0%

Job Costing: Benefit (cont)
Which Product Provides the Greatest Profit

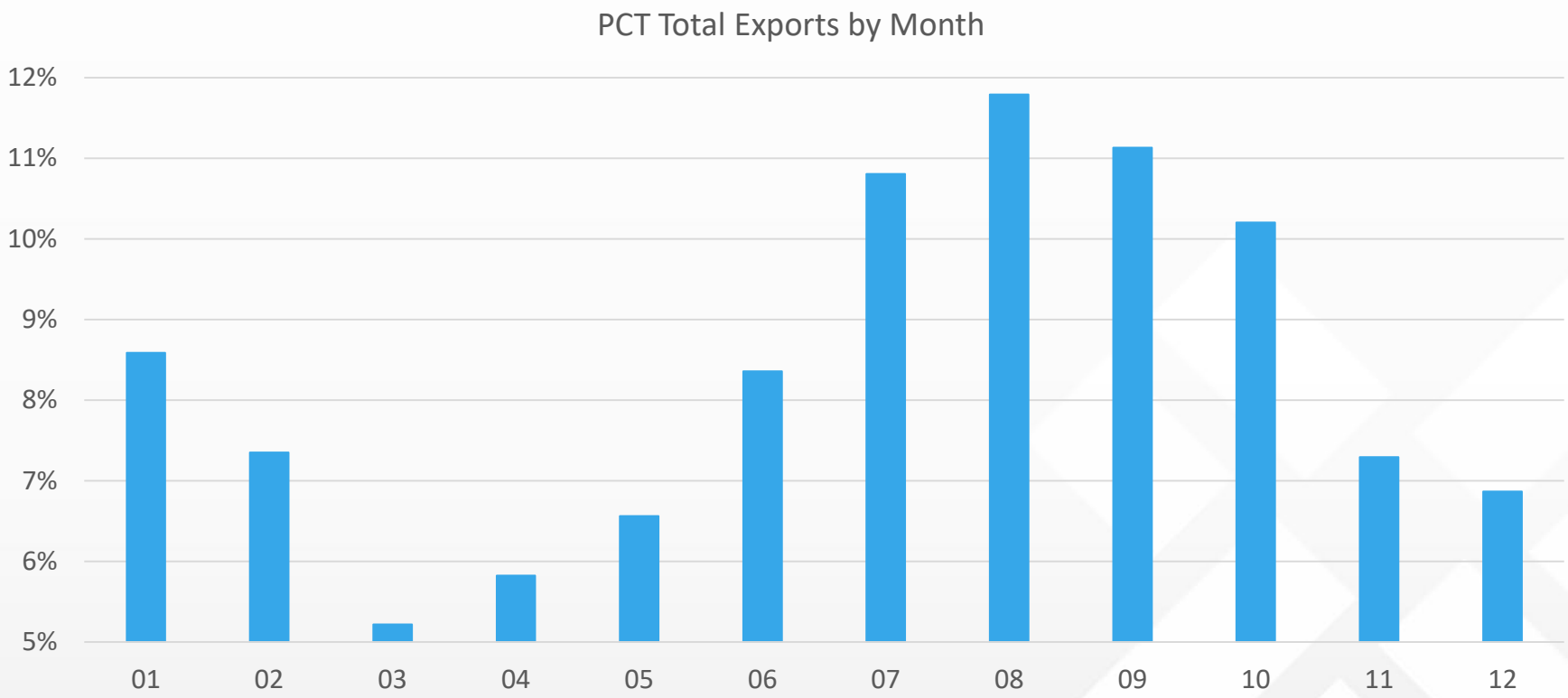
Product: Circular Knit (cut & sew)			
Product	Total sales	Gross Profit	Net Profit
T-shirt	$1,000	10.0%	2.5%
Polo shirt	$700	15.0%	4.5%
Fashion Blouse	$500	30.0%	8.0%
Dress	$550	40.0%	15.0%

Job Costing: Benefit (cont) High Season vs Low Season

In a world without seasons, the volume of business would remain constant each month at 8.33%, because 8.33% times 12 months equals 99.99%. In the chart below, exports in March were less than half of exports in August, meaning overheads per unit in March were more than double that in August.

Percentage Garment Exports by Month													
Month	01	02	03	04	05	06	07	08	09	10	11	12	
% of Annual	8.6%	7.3%	5.2%	5.8%	6.6%	8.4%	10.8%	11.8%	11.1%	10.2%	7.3%	6.9%	
Value ($.000)	859	735	522	582	656	836	1081	1179	1113	1021	729	687	10000

High Season Low Season Graph



High Season vs Low Season
Minimizing Low Season Loss

In Low season you are going to lose money. The goal is to reduce the losses, by increasing sales. One method is to increase sales from your current customers by reducing your FOB price. The question is, how much can you give away and still come out ahead.

It is all about overhead

	Job Costing		PCT Labor		
	Overhead	$2.23	362%		
	PCT Annual Exports	Vs AVG 8.33%		Overhead	Added OH
March	5.2%	62.4%	576%	$3.57	-$1.34
April	5.8%	69.6%	517%	$3.20	-$0.97
May	6.6%	79.5%	452%	$2.80	-$0.57

You will recall ffrom our basic costing we calculated overhead to be $3.00.
If gave the customer a reduction of 10%,
this would amount to only $0.30 and given that overhead also includes profit, we might even come out ahead.
Even a reduction of 20% ($0.60) would still be to our advantage

Other Cost Factors: Branch Factories

Factory groups with multiple branch operations should treat each branch as an independent unit. In this way management can compare the performance of one branch over another. There are important factors to consider:

1. The branch factory should not be subsidized for work performed by the head factory. For example, if the head factory provides product development, the added cost of product development should be added to the branch factory cost sheet.
2. The branch factory that performs special services should benefit from those services. For example, if the branch offers fast turn, both the added cost and profit should be included in the branch factory cost sheet.
3. If the branch factory offers value to the customer completely apart from anything it does, such as close proximity or duty-free access, those benefits should also be included in the cost sheet.

Other Cost Factors: Subcontract Factories

For the purpose of costings, the relationship between the factory and the subcontractor should be the same as an agent with the factory, with the subcontractor playing the role of a separate factory. As with any agent-factory relationship, gross profit should be calculated as a commission.

Once again, the factory does not want to subsidize the work of the subcontractor. It is therefore important that all work provided by the parent company be part of the overhead to be deducted from the subcontractor's gross profit.

As the industry progresses, and the role of the supplier becomes increasingly more important, qualified factories no longer have to accept any order, from any customer, at any price. In this new model industry, the factory will have the choice of which customer it wants to work with.

The data obtained from the job costing is an indispensable tool allowing the factory to make the right choices, whether they are choosing one customer over another or one product over another. Customers and products for orders during low season will also be highly valued.

The Limits of the Basic Cost Sheet

The basic cost sheet is limited to FOB. In today's world FOB is of little importance to total costs because total cost is based on retail Price

1. A garment with an FOB price of $10.00 will retail for $60-$80, with the result that FOB is only 16.7%-12.5% of the retail price
2. In today's world where garments are sourced, where the customer has prices for all materials, CM is the only area of negotiation between the customer and the factory. A CM of $3.00 is only 5.0%-3.8% of retail
3. Most of the CM is not open to negotiation. The factory cannot ask workers to acceptages nor can they ask the electric company to reduce is bill claiming the customer is paying less. Indeed the only area open to negotiation is profit. A profit of $0.50 is only 0.8%-0.6% of retail.

Factory Cost as a PCT of Retail Price		
FOB	$10.00	PCT of Retail
Retail Price	$60-$80	16.7%-12.5%
CM	$3.00	5.0%-3.8%
Profit	$0.50	0.8%-0.6%

Why do customers and their suppliers concentrate their efforts over the 1% and ignore the other 99%

Beyond the limits of the Basic Cost Sheet (cont): Determining the costs of items not on the cost sheet

Increased fabric Cost ≠ increased garment cost

Back to our Basic Cost Sheet

Basic Costsheet		
Fabric	60%	$6.00
Trim	10%	$1.00
CM	30%	$3.00
FOB	100%	$10.00

Imagine your factory is located in Mexico, a country with a free-trade agreement with the U.S. However, to enjoy duty-free-access, all materials have to be of US origin or imported from a country member of the same FTA.

Assume that local fabric is available but at a higher price that would increase fabric cost from $6.00 to $7.00. The basic cost sheet shows only that local fabric increases FOB cost from $10.00 to $11.00 which renders the use of local fabric unacceptable because import duty has not included in the Basic Cost sheet

Beyond the limits of the Basic Cost Sheet (cont):
Determining the costs of items not on the cost sheet

Chinese Fabric vs Local Fabric				
	Chinese Fabric		Local Fabric	
	factors	Cost	Cost	Factors
Fabric	60.0%	$6.00	$7.00	63.6%
Trim	10.0%	$1.00	$1.00	9.1%
CM	30.0%	$3.00	$3.00	27.3%
FOB	100.0%	$10.00	$11.00	100.0%
Duty	16.2%	$1.62	$0.00	
LDP		$11.62	$11.00	

Beyond the limits of the Basic Cost Sheet 1: Determining the costs of items not on the cost sheet 3
The End-to-End Cost sheet

End-To-End Costing			
		Factors	Cost
1	Material		$6.00
2	Trim		$1.00
3	CM Labor		$0.64
4	CM Overhead		$1.86
6	CM Total Cost		$2.50
7	Total Factory Cost		$9.50
8	Net Factory Profit	5.0%	$0.50
9	Total FOB Cost		$10.00

The End-to-End Cost sheet

		Factors	Cost
1	Material		$6.00
2	Trim		$1.00
3	CM Labor		$0.64
4	CM Overhead		$1.86
6	CM Total Cost		$2.50
7	Total Factory Cost		$9.50
8	Net Factory Profit	5.0%	$0.50
9	Total FOB Cost		$10.00
10	Agent Commission	5.0%	$0.50
11	Freight		$0.25
12	Duty	16.2%	$1.62
13	Clearance		$0.10
14	Transport		$0.15
15	Total DDP		$12.62
16	Product Development Loading	20.0%	$2.52
17	Distribution Center Loading	5.0%	$0.63
18	In-Store		$15.78
19	Markup	75.0%	$47.33
20	Retail		$63.10
21	Markdown	33.0%	$20.82
22	Net Retail		$42.28
23	**Net Customer Profit**		**$26.50**

The End-to-End Cost sheet: 2

10	Agent Commission	5.0%	$0.50
11	Freight		$0.25
12	Duty	16.2%	$1.62
13	Clearance		$0.10
14	Transport		$0.15
15	Total DDP		$12.62
16	Product Development Loading	20.0%	$2.52
17	Distribution Center Loading	5.0%	$0.63
18	In-Store		$15.78

The End-to-End Cost sheet: 3

19	Markup	75.0%	$47.33
20	Retail		$63.10
21	Markdown	33.0%	$20.82
22	Net Retail		$42.28
23	**Net Customer Profit**		**$26.50**

The End-to-End Cost sheet: 4 Notes

The end-to-end cost sheet is divided into 3 sections

1. Items 1-9 From the beginning to FOB: the basic cost sheet
2. Items 10-18 From FOB to arrival of the goods to the store (or branch stores)
3. 19-23 from in-store delivery to the retail sale of the last garment.

As we have seen, events that occur after the garment has been shipped such as import duty (12) can be affected by events at the factory. What is true of import duty is equally true of markdowns (21) as well as events that occur before the factory usually becomes involved such as product development (16)

The Greatest Cost
Case Study: The $0.09 Loss

This is the problem

It is all about patternmaking

- ✓ The cost for patternmaking when carried out in the customer's home country = $0.10 per sold unit
- ✓ The cost for patternmaking when carried by the factory = $0.01 per sold unit
- ✓ Which costs less?

If you said patternmaking by the factory is less --- The customer saves $0.09 --- would be wrong

Look back to the end-to-end cost sheet. Look for patternmaking. Patternmaking is in the cost sheet. It is a part of product development (16). The problem is that the cost of patternmaking is locked into product development, which means that the cost of every garment imported by the customer is charged $0.10 for patternmaking

REGARDLESS OF WHO OR WHERE THE PATTERN WAS CUT.

To this we have to add the cost of patternmaking by the factory --- $0.01.

Therefore the correct answer is the cost of patternmaking by the customer = $0.10

The cost of patternmaking by the factory = $0.11

According to the end-to-end cost sheet, the $0.09 savings never existed

Understanding Costs and Cost sheets

The story of the lost $0.09 is not some party trick.
It is the single most serious and most important cost factor

Indeed it explains why management decisions often fail achieve the expected goals

The lost $0.09 is the subject of the advanced presentation