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New Technologies Unit
Technology Promotion and Development Division

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Leather Product and Shoe Manufacturing *On-the-Job* Training Programme

Background Material

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INTRODUCTION

Early in 1993 the New Technologies Unit, in cooperation with the Leather Programme of UNIDO, carried out a series of footwear manufacturing technology seminars in East Africa. Over a month and a half five African countries of the region were visited, with seminars and factory visits taking place in each. This activity led to a great deal of discussion between participants in the seminars, the New Technologies Unit, the UNIDO expert and the Leather Programme on methods of follow-up. What was needed was an activity which 1) developed in participants a greater understanding advanced management concepts; 2) assisted participants in the implementation of the techniques and technologies at a factory level; 3) allowed for one-on-one contact and interaction with experts; and 4) covered a number of companies at a reasonable cost. The *On-the-Job Training Programme* is the result.

The *On-the-Job Training Programme* covers a variety of techniques and technologies central to the competitive management of a shoe manufacturing company. It begins with an overview of work study techniques, methods which allow managers to increase productivity within the constraints of current resources. It then moves on to outline the variety of layouts possible on the factory floor. The role of management in all its facets is then covered, including the importance of a total quality approach. Control systems for production, quality and costs are also outlined. Finally, the course wraps up with a Consultancy Kit, a series of questions all managers should ask themselves when reviewing the operations of their firm.

The New Technologies Unit, part of the Technology Promotion and Development Division, is the back-stopping unit for the *On-the-Job Training Programme*. It undertakes various promotional activities, with a broader aim than that of technical co-operation. Technological advances in fields such as new materials, manufacturing, marine industrial technology, energy and environment technologies bear far-reaching implications for the business strategies of both developed and developing countries. The Unit's technology promotion encompasses a wide range of activities designed to provide access to and information on new technologies while assisting in the formation of effective business strategies. These include the promotion of international and regional centres, like the International Centre for Science, a Unit-backstopped project, and a variety of studies, networks and publications.

The Leather Unit, of the Organization's Industrial Operations Technology Division, is the group responsible for the project "Regional Africa Hides and Skins, Leather and Leather Products Improvement Scheme". It has played a central role in the planning, development and implementation of the Seminar Series for Leather Product and Shoe Manufacturing in Africa. The Leather Programme's National Experts are responsible for all implementation at the local level, while selection of the expert, locations and inputs on topics have come from the Unit's management. With technical assistance provided by the Leather Unit varying from $6 - 8 million a year, the Leather Programme is one of the largest in UNIDO, with activities taking place across Africa.

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WORK STUDY

Work Study is a term used for those techniques, particularly Method Study and Work Measurement, which are used in the examination of human work in all its contexts. It aims at the problems of increasing productivity through the systematic analysis of existing operations. It can contribute towards the increase of productivity with little or no extra capital involved.

Method Study is the systematic recording and critical examination of existing methods. It can result in obtaining more effective systems of manufacture.

Work Measurement is the application of techniques designed to establish the time required, for a qualified worker to carry out a specified job at a defined performance. In many instances, it may be necessary to train or retrain the workforce to obtain the specified quality standard at the defined level of performance.

The introduction of a Work Study system should result in a number of improvements such as:

1. Increase in Productivity.
2. Accuracy in establishing standards of performance.
3. Increased material savings.
4. Improved efficiency.
5. More efficient labor costs.

People often discuss the concepts of Productivity and Production and both are sometimes classed as meaning the same thing. Of course there is a dramatic difference. Production is generally thought of, as the output of a plant or the flow of a product through the plant. Productivity is the ratio of input and output. It is nothing more than the arithmetical ratio between the amount produced and the amount of any resources used in production.

These resources may be:

1. Materials
2. Plant Machines and Tools
3. The Services of Men

It is possible to have a combination of all three.

Productivity of Materials

A skilled cutter is capable of cutting 21 shoes from a skin of leather.

An unskilled cutter is only capable of cutting 20 shoes from a similar skin of leather.

The skilled cutter obtained 5% greater productivity.

Unskilled Cutter - 20 shoes
Skilled Cutter - 21 shoes
Difference - 1 shoe
Difference - 1/20
- 5%

Productivity of Machines

If a machine tool has been producing 100 pieces per working day, and through the introduction of better cutting tools the output is increased to 120 pairs, the productivity will have increased by 20%.

Old System - 100 pieces
New System - 120 pieces
Difference - 20
- 20/100
- 20%

Productivity of Men

If an operative has been attaching 30 pairs of soles per hour, and improved conditions enable him to produce 40 pairs per hour, the productivity has increased by 331/3%

Normal 30 pairs
Improved 40 pairs
Difference 10
10/30
331/3%

An increase in production does not signify an increase in productivity. The following examples demonstrate why this is so.

Example 1

Three men produce 300 pairs of shoes daily.
The team is increased by one man.
Four men produce 400 pairs per day.
300 pairs /3 men = 100 pairs per man.
400 pairs /4 men = 100 pairs per man.
Production has increased by 100 pairs.
Productivity remains the same at 100 pairs per man.

Example 2

Three men can insole attach 300 pairs daily.
The method in use is reorganized.
Three men can now produce 360 pairs daily.
Increase of 60 pairs = 60/300 = 1/5 = 20%
Productivity has increased by 20% with the same resources.
Production has increased by 20%.

Example 3

Five men can forepart last 500 pairs daily.
The team is increased by one man.
Six men increase the production to 540 pairs daily.
500 pairs / 5 men = 100 pairs per day.
540 pairs / 6 men = 90 pairs per day.
Difference = 100 - 90 =10
10 / 100 = 10% decrease in productivity.
Labor Team = 5 men
Increased to 6 men
Difference of one man = 1/5 = 20/100 = 20% increase
Daily output of 500 increased to 540
40/500 = 8/100 = 8% increase in production.
Productivity decreased by 10%
Labor team increased by 20%
Production increase by 8%.

Example 4

Five workers can stitch 100 leather hand bags per day.

Each worker collects her work from the previous operation.

Reorganization eliminates the need for collection.

Four workers can now stitch 100 handbags per day.

100 bags / 5 workers = 20 per worker.

100 bags / 4 workers = 25 bags per worker.

Difference = 5 = 5/20 = 1/4 = 25%

Production in each instance is 100 bags.

Productivity has increased by 25%.

Production remains the same.

Conclusions

1. An increase in production does not by itself indicate an increase in productivity.
2. If the output in resources goes up in direct proportion to the increase in output, the productivity will stay the same. (Example 1).
3. If the input of resources goes up by a greater percentage than output, higher production will be achieved at the expense of a reduction in productivity. (Example 3).
4. Higher productivity means that more is produced with the same expenditure of resources. i.e. same cost in terms of materials, machine time, or labor. (Example 2).
5. Alternatively that the same amount is produced at less cost in terms of either materials, machine time or labor. This is also an example of an increase in productivity. (Example 4).

The Productivity Factor

It is often assumed that productivity is always the productivity of the labor force. Of course this is not so. It is necessary to make the best possible use of all available resources, which include Government, Management and Labor.

The Government plays an extremely important part in this process. It is necessary to create conditions which are favourable to the efforts of employers and workers to raise productivity. A programme of economic development is required which will cater for all sections.

In may countries, a large proportion of the basic raw materials are imported and need to be paid for in scarce foreign currencies. In the Footwear Industry, an ideal situation would ensure that materials, components, grindery items and chemicals were manufactured within the country. This would create extra employment. It would also reduce the time factor involved in obtaining the materials, and in the manufacturing process.

The Manufacturers Association should be working closely with the Government in these areas.

Management are responsible for ensuring that the organization structure is such, that the most efficient use of Machinery and Equipment, Space, Materials, Production Systems, Manufacturing Processes and Labor is obtained. The Work Study system will not function unless all of those factors are being operated successfully.

There are often difficulties involved in obtaining the active cooperation of the Workforce. The fears that increased productivity may lead to unemployment or short time working are always present. The situation is accentuated when unemployment already exists within the locality. Those are areas that need the utmost attention. It is always necessary for management to have full discussion with the labor force, particularly prior to the introduction of the Work Study system. In the final analysis Management will only be successful if they can obtain the willing cooperation of workers at all levels.

What is the role of Management?

The Management

Obtains the facts

Plans

Directs

Coordinates

Controls

Motivates

in order to produce

Shoe & Leather Goods Products

It is necessary for Management to create a favorable climate for a productivity programme.

- To obtain cooperation of workers (this is necessary for real success).
- To obtain the cooperation of the trade unions.
- It is important to explain policy to workers so that management and workers can move forward together.
- It is important for management to understand that coercion is no substitute for voluntary action.
- The most difficult task that management has is to encourage people to cooperate.

Basic & Excess Work Content

The two factors involved in the make up of any job or operation are the Basic Work Content and Excess Work Content.

Basic Work Content

This is the minimum time required theoretically required to produce one unit of output. This is a perfect situation which rarely occurs in practice.

Excess Work Content

1. The work content is increased by work content added by defects in the design or specification of the product.
2. Work Content added by inefficient methods of production or operation.
3. Ineffective time due to shortcomings on the part of management.
4. Ineffective time within the control of the worker.

Low Productivity due to Defects in Design or Specification of Product

Companies can benefit from a much closer relationship between the functions of Design, Product Engineering and Manufacturing. This is an extremely important area. New designs are sometimes introduced to a manufacturing unit without any attention to pattern development, manufacturing processes or cost control.

It is often suggested that unless large shoe ranges are available and new designs being constantly added, sales will not be maintained or increased. Is there adequate understanding of the market to make those assumptions?

In some companies, it is also considered necessary to maintain the old designs, as orders may be received for such styles one, two or three years after the initial introduction. Consequently hundreds of designs are available in the work place. In those circumstances, it is difficult for the work force to increase productivity because of a lack of repetition in operations.

A variety of products and shoe constructions also discourages increased productivity. The problems can be eliminated when it is possible to install a manufacturing unit for each construction. However this cannot always occur because of lack of sales.

A decrease in productivity occurs, if extra work is required in the manufacturing process, to combine poorly shaped components, or to last uppers that are tight fitting or loose fitting on the last. Problems often occur because of the incorrect position of seams, perforations and laps. Consequently, the number of operatives employed on the manufacturing track is increased to deal with the problems.

Pattern development programmes are sometimes non existent. On occasions there is an inadequate labor force available in the pattern section. Surprisingly in those circumstances, management are often perplexed when patterns do not fit correctly. In many instances, modifications occur on paper, but tests with leather shoes are not always processed to ascertain whether the patterns or modifications are correct.

To summarize, it can be stated that the problems as listed, will not encourage high productivity.

1. Inadequate knowledge of the market requirements.
2. Lack of pattern development programmes.
3. Excessive variety of products.
4. Excessive number of designs.
5. Ill fitting patterns
6. Incorrect position of seams, perforations and laps.
7. Lack of standardization or costs structures.
8. Lack of personnel in Pattern development centre.

The Value Analysis Team System

It is advantageous to introduce a system to ensure that all designs are examined in detail prior to bulk production.

This can be achieved by the use of the Value Analysis Team System.

The use of this system assists in eliminating faulty patterns, and faulty manufacturing. The price structure is stabilized.

Normally the team consists of:

- Factory Manager
- Designer/Pattern Cutter
- Supervisors
- Accountant
- Work Study Officer
- Quality Controller
- Production Planner
- Material Controller

The aims of the team are as follows:

1. To produce shoes that are within the specified cost.
2. To produce designs that are saleable.
3. To produce designs that are problem free in relation to manufacture.
4. To produce designs with the minimum labor and material necessary, while still retaining the marketing requirements.
5. To ensure that the materials specified can be obtained readily.

The team discusses and makes suggestions for each design produced during each phase of the development programme.

Each design is costed during the programme.

The designer has list of restrictions. Included are the cost of materials, labor and bottom unit costs that are available for each price bracket.

A labor capacity plan is produced for each design. It is necessary for the supervisors to examine each product in relation to the availability of skills and equipment, at the manufacturing unit.

Bulk Development Programme

Day 1

Analysis meeting with Management/Stylist/Pattern Cutter/Factory Staff Discussion and analysis of design, and method of construction.

Modifications to design where necessary, and second shoe manufactured and costed.

Day 2

Cutting Dept.

Cut uppers, linings for shoe development

Cut paper pattern for shoe allowances

Comments entered on Design Card

Return items to Design Centre.

Closing Dept.

Stitch uppers, linings etc.

Comments entered on Design Card

Return items to Design Centre.

Day 3

Manufacture in Components/Closing/Lasting to Shoe Room

Comments entered on Design Card

Return to Design Centre

Day 4

Pathfinder Sizes 3/5/7 (Manufacture in Cutting/Closing/Lasting)

Comments entered on Design Card

Return to Design Centre

Discussion with Staff on details of finished shoes and costs.

Produce patterns, knives, dies etc., for bulk production.

Low Productivity created by Inefficient Methods of Production

- Lack of material savings
- Cutting boards faulty
- Damages at skiving
- Poor lining fit
- No guides at seam closing
- Top stitching without knife attachment
- Top stitching without guides
- Components attached prior to stitching
- Incorrect fit of stiffeners
- Insufficient time dwell (causing week bonds)
- Incorrect fit of plates at lasting
- Excessive roughing (damages)
- Heel attach (with excessive pressure) Broken heels

Ineffective Time due to shortcomings of Management

- Marketing Policy
- Lack of Standardization
- Designing Changes
- Planning
- Lack of materials
- Plant Breakdowns
- Plant in Poor Condition
- Inferior Working Conditions Lack of Training
- Untrained Supervision
- Style of Management
- Lack of Communications
- Unfair Labor Practices

Ineffective Time within the Control of the Workers

- Attitudes
- Careless Workmanship
- Time keeping
- Idleness
- Lack of Commitment

Basic Procedures of Method Study

There are eight activities in the process. They are as follows:

1. Identify and select the process to be studied
2. Record each activity
3. Examine each element

    a. Reason for activity
    b. Location of process
    c. Sequence
    d. Operator
    e. Method used.

4. Construct the most economic method
5. Define
6. Record the information for future identification.
7. Introduce the new system as agreed standard practice.
8. Maintain the new standard practice.

Select work to be studied

When selecting work to be studied, there are a number of issues that may be involved. Obviously the financial savings that can be achieved will have an important bearing on the operation or area chosen for study.

Areas that require constant overtime will also need to be examined.

Interruptions to the work flow and operations where a build up of work constantly occurs, also need to be examined.

Operatives often complain of problems that often disrupt the work flow. Obviously those situations need to be examined.

Material costs are always extremely high. Losses in this area need to be examined.

Examine the facts

It is necessary to examine critically all of the facts recorded during the method study process. Such an investigation can be assisted by a series of questions which are part of the method study process.

All aspects of the process must be challenged, and importance must be placed on detail. It is suggested that new systems can only be introduced when all of the inefficient aspects of the current method are eliminated. It is important to be fair to both management and operatives when reaching conclusions.

Questions that are the basis of successful method study.

Purpose

What is done?

Why it is done?

What else might be done?

What should be done?

Place

Where is it done?

Why is it done there?

Where else might it be done?

Why should it be done?

Sequence

When is it done?

Why is it done there?

When might it be done?

When should it be done?

Person

Who does it?

Why does that person do it?

Who else might do it?

Who should do it?

Means

How is it done?

Why is it done that way?

How else might it be done?

How should it be done?

The questioning technique should enable us to obtain the following results.

Purpose	To ensure that the job is necessary.
Place	To ensure that it is being done where it should be done.
Sequence	To ensure that it is in the correct position in the sequence of operations.
Person	To ensure that the operation is being performed by the right person.
Means	To simplify the job as much as is economically possible.

Question each element

A. Reason for activity
B. Location of process
C. Sequence
D. Operator
E. Method used

It is suggested that the following points are covered during the investigation.

a. Suitability of materials for mass production processes.
b. Are there any specific problems associated with any of materials.
c. What are the problems related to the activity.
d. What are the specifications of the job.
e. Will the operation continue in the foreseeable future.
f. Will there be an increase in production requirements in the future
g. How many operatives re employed on the operation (a) directly (b) indirectly.
h. How many pairs does each operative produce daily.
i. How does the hourly output compare with the daily output.
j. What is the form of payment (i) Team work (ii) Piecework (iii) Bonus (iv) Day rate
k. Are the machines in use for all of the working period
l. Do mechanical breakdowns occur regularly on any of the machines
m. If so, what are the reasons
n. do any of the machines need to be replaced
o. Is the layout suitable for the type of production process
p. Is there surplus space available
q. Is it possible to reduce the work content
r. Is it possible to increase production with the existing layout
s. Are frequent design changes causing problems
t. Can the designs be altered for easier manufacture.
u. Are there too many designs
v. Are the operatives sufficiently skilled to achieve the required results
w. What form of training occurs within the production unit
x. Are experienced trainers available
y. Is there enough work available to increase productivity
z. Is there a constant work flow throughout the daily working period
a' If not, what are the problems
b' Is the work load sufficient for the labor force
c' Is there sufficient work being received daily from other departments
d' Are there orders available for the amount of work required daily.

What savings or increase in productivity may be expected from a method improvement.

1. Through reduction in work content.
2. Through better machine utilization.
3. Through better use of labor.

Construct the most economic method

When the operation has been studied, it will be necessary to construct the most economic method of performing the operation.

There are a number of areas that require examinations.

1. Can the product be simplified in any way, to increase productivity, without affecting the appearance of the product.
2. Is the operation being performed in the most efficient manner. Can some of the elements be eliminated. Can the operation be combined with another process.
3. If the type of material in use is affecting the process, is it possible to obtain a more suitable material.
4. Is extra training required to improve the performance of the operatives.
5. Having examined all of those areas, it should be possible to obtain a new work method.
6. When the new proposals have been clarified, it will be necessary to prepare a report, which should include details of the existing and proposed methods, and reasons for the suggested changes. This information should include:

    a. Comparison of costs for the two methods, including product changes, material labor and overhead costs.
    b. Installations and training costs.
    c. Charts and diagrams where necessary.
    d. Decisions and actions required to implement the changes.

Defining the improved method

Before the new method is installed, the new proposals will need to be accepted by Management.

Installing the new method

The concluding stages in the process can present some problems. Approval of the new method is required from both Management and Operatives.

Confidence and trust is necessary to ensure that the cooperation of the workers is maintained.

Maintain

Generally it is necessary for supervision to be very much involved during the installation and maintenance of the new system. They are responsible for ensuring that there are no deviations from the agreed procedure. It is a period when the workers will require a lot of encouragement. It is necessary to maintain enthusiasm and confidence.

Work Measurement

Work measurement is the application of techniques designed to establish the time for a qualified worker to perform a specified job at a defined level of performance.

The uses of work measurement include the following:

1. Comparisons can be made of alternative methods of manufacture.
2. The system assists in determining the amount of work that can be performed by an operative in a specific time.
3. It is possible to obtain the information required to ensure that the divisions of labor for each operative on the production line is correct.
4. In relation to Production Scheduling, the information is available regarding the time required to manufacture each design and product from Cutting to Boxing. It is essential that this information is available when preparing the weekly production plan
5. Information for labor cost control is available.
6. Incentive schemes.
7. Estimation of future labor requirements.
8. To optimize machine utilization and performance.

The Basic Procedures for Work Measurement

The procedures are similar to those specified for Method Study, although not all of the processes are required.

1 Select the work to be studied.

2. Record all of the relevant data relating to the circumstances in which the work is being performed, the methods and the elements of activity in them.
3. Examine the recorded data and the detailed breakdown critically
4. Measure the quantity of work involved in each element in terms of time.
5. Compile the standard time for the operation, which in the case of the stop watch study will include time allowances to cover relaxation, personal needs and contingencies, etc.
6. Define precisely the series of activities and methods of operation for which the time has been specified.

Selecting the work to be studied

There is always a reason why it is necessary to choose a specific operation for study.

1. Introduction of new operation
2. Method or material changes
   New standards are required because of changes in materials or methods
3. Workers are not satisfied with the time value
4. "Bottlenecks" or Production problems are constantly occurring.
5. Introduction of new incentive scheme.
6. Required output is not achieved.
7. High operational costs.

Steps in making a time study

When the work to be measured has been selected, the production of a time study usually consists of the following eight steps.

1. Obtaining and recording all the information available about the job, the operative and the surrounding conditions, which is likely to affect the carrying out of the work.
2. Recording a complete description of the method, breaking down the operation into elements
3. Examining the detailed breakdown to ensure that the most effective method and motions are being used, and determining the sample size.
4. Measuring with a timing device (usually a stop-watch) and recording the time taken by the operative to perform each "element" of the operation.
5. At the same time, assessing the effective speed of working relative to the observers concept of the rate corresponding to standard rating.
6. Extending the observed times to "basic times".
7. Determining the allowances to be made over and above the basic time for the operation.
8. Determining the "standard time" for the operation.

Checking the Method

1. Before proceeding with the study, it is important to check the method being used by the operative. If the study is for the purpose of setting a time standard, a method study should already have been made, and a written standard practice sheet completed. In this case it is simply a question of comparing what is actually being done with what is specified on the sheet.
2. Recording a complete description of the method, breaking down the job into elements.

   - An element is a distinct part of a specified job selected for convenience of observation, measurement and analysis.
   - A work cycle is the sequence of elements which are required to perform a job or yield a unit of production.
   - A work cycle starts at the beginning of the first element of the operation or activity, and continues to the some point in a repetition of the operation as activity.

   A detailed breakdown into elements is necessary:

   - To ensure that productive work (or effective time) is separated from unproductive activity (or ineffective time).
   - To enable the different types of elements to be identified and classified, so that each may be accorded the treatment appropriate to its type.
   - To enable the performance of the operative to be "rated" as accurately as possible over each individual element.

Types of element

a. A repetitive element is an element which occurs in every work cycle of the job e.g. picking up a part prior to an assembly operation, or putting aside a finished article.

b. An occasional element is an element which does not occur in every work cycle of the job, but may occur at regular or irregular intervals e.g. adjusting tension on a machine, or receiving instructions from a foreman.

c. Constant Elements - the basic time remains constant such as switching on a machine.

d. A variable element is such, where the basic time varies in relation to some characteristic of the product, e.g. push trolley depends on distance between operations.

e. A foreign element is an element observed during a study which after analysis, is not found to be a necessary part of the job. e.g. degreasing a part that has still to be machined further.

It is usual to examine the process for a period prior to the timing operation. This will assist the Time Study Officer in recognizing the elements involved, and where they begin and end. The break points need to be distinguished clearly so that they may be more easily recognized.

Elements should be as short as can be conveniently timed.

If the element is less that 0.10 minutes, not enough time is available for accurate rating.

If the time of the element is greater that 0.6 minutes, the operators rate of working may vary, and an incorrect rating assessment will occur.

3. Examining the detailed breakdown to ensure that the most effective method and motions are being used. It is important prior to the timing of the operation, that an examination of the method being used by the operator is made. It will be necessary to eliminate any ineffective time or unnecessary motions. The elimination of ineffective time will encourage an increased output. It also eliminates the possibility of future excessive earnings.

4. Measure with a timing device, the quantity of work involved in each element in terms of time required by the operator to perform each element of the operation. There are different types of stop watch used for this purpose. However, the type generally used is known as the "flyback decimal minute stopwatch".

   In this type of watch the movement is started and stopped by a slide (1) at the side of the winding knob (B). Pressure on the top of the winding-knob causes both the hands to fly back to zero without stopping the mechanism, from which point they immediately move forward again. If the slide is used, the hands can be stopped at any point on the dial and restarted without returning to zero as soon as the slide is released. This type of watch can be used for either "flyback" or "cumulative" timing.

   Although both methods of timing are acceptable, the cumulative timing is generally accepted as the most suitable for most purposes.

In cumulative timing, the watch runs continuously throughout the study. It is started at the beginning of the first element of the first cycle to be timed and is not stopped until the whole study is completed. At the end of each element, the watch reading is recorded. Consequently the individual element times can be obtained after the study is completed.

In all time studies, it is usual to take an independent check of the overall time of the study using either a wrist watch, or the clock in the study office.

5. Assessing the effective speed of working of the operative relative to the observers concept of the rate corresponding to standard rating. Rating is a comparison of the rate of working noted by the Work Study Officer, with a standard rate, which in his or her opinion is normal. An unskilled operative may move extremely fast and yet take longer to perform an operation than a skilled operative who appears to be working quite slowly.

   The unskilled operative uses a lot of unnecessary movements which the experienced operative has long since eliminated. The only thing that counts is the effective speed of the operator. Judgment of effective speed can only be acquired through experience and knowledge of the operations being performed.

Examples of various rates of working on the Principal Rating Scales

Scales				Description	Comparable working speed (km/h)
60-80	75-100	100-133	0-100		
0	0	0	0	No activity	
40	50	67	50	Very slow, clumsy, fumbling movement, operator appears half asleep, with no interest in the job.	3.2
60	75	100	75	Steady, deliberate, unhurried performance, as of a worker not on a piecework but under proper supervision; looks slow but time is not being intentionally wasted while under observation.	4.8
80	100	133	100 (Standard Rating)	Brisk, businesslike performance, as of an average qualified worker on piecework; necessary standard of quality and accuracy achieved with confidence.	6.4
100	125	167	125	Very fast operator, exhibits a high degree of assurance, dexterity and coordination of movement, well above that of an average trained worker	8
120	150	200	150	Exceptionally fast; requires intensive effort and concentration and is unlikely to be kept up for long periods; a virtuoso performance only achieved by a few outstanding workers.	9.6

Another accepted example of working at the standard rate is dealing a pack of 52 playing cards in 0.375 minutes.

6. Extending the observed times to "basic times".

   $$\frac{\text{Observed time x Rating}}{100} = \text{Basic Time}$$

7. Determining the allowances to be made over and above the basic time for the operation.

   Certain allowances are usually added to the basic time. Those are usually listed under two headings.

   a. Contingency Allowance

      This is a small allowance of time which is provided for small delays and occasional minor extra work.

   b. Relaxation Allowance

      This allowance is also an addition to the basic time, which is given in respect of fatigue.

8. Determining the "Standard Time" for the operation

   The final step is to add contingency and relaxation allowances to the basic time, and to obtain the "Standard Time" for the operation.

   The standard time is the total time in which a job should be completed at standard performance.

PLANT LAYOUT

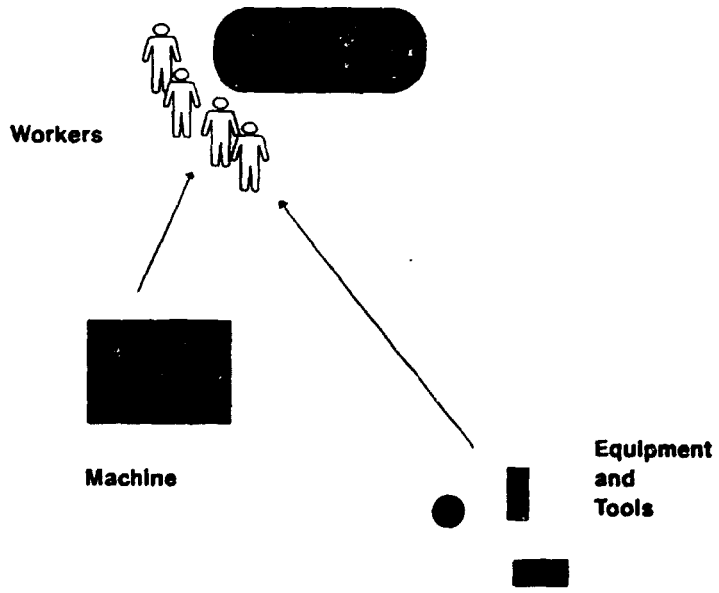
It becomes necessary at some stage to look critically at the movement of men, machines and materials. In effect it is often necessary to examine the entire layout. This may occur because of expansion requirements or changes in design and production processes

In some instances, temporary arrangements may have been made to cope with an emergency situation, such as the sudden increase in demand for a certain product. In many instances those arrangements remain on a permanent basis, even though the need for them no longer exists. Consequently the layout is no longer efficient. The net result is that material and workers often have to make long roundabout journeys in the course of the manufacturing process. This leads to a loss of time and energy without anything been added to the value of the product. Improving the plant layout is therefore part of the job of the work study specialist.

Plant layout is the arrangement of the desired machinery and equipment of a plant, designed to permit the easiest flow of materials, at the lowest cost, and with the minimum of handling in the manufacturing process.

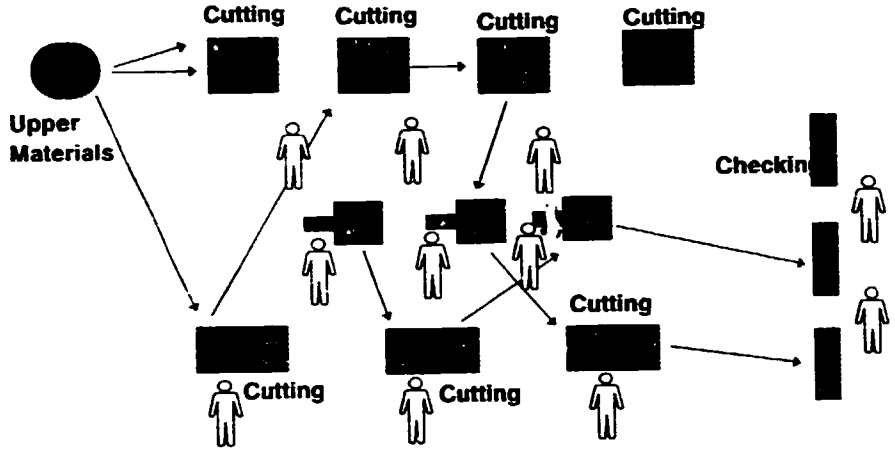
Layout by fixed position

This arrangement is used when the material to be processed does not travel round the plant but stays in one place. All of the necessary equipment and machinery is taken to it instead. This occurs when the product is bulky and heavy, and few are manufactured at a time. Examples of this process include aircraft construction, ships and diesel engines.



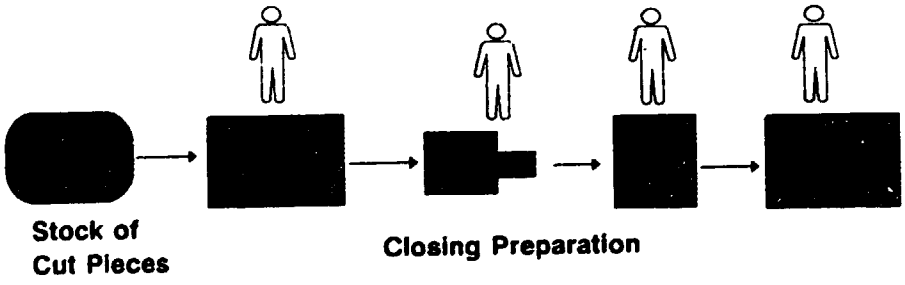
Layout by process

All operations of the same nature are grouped together. This type of layout is used in the Footwear Industry. The cutting machines and benches are located in one area. The preparatory and sewing operations are located in another are followed by the lasting and making processes. This layout is usually chosen when a large number of products which share the same machinery are being made. Normally in this instance, each product has a relatively low volume of output.



Product line layout

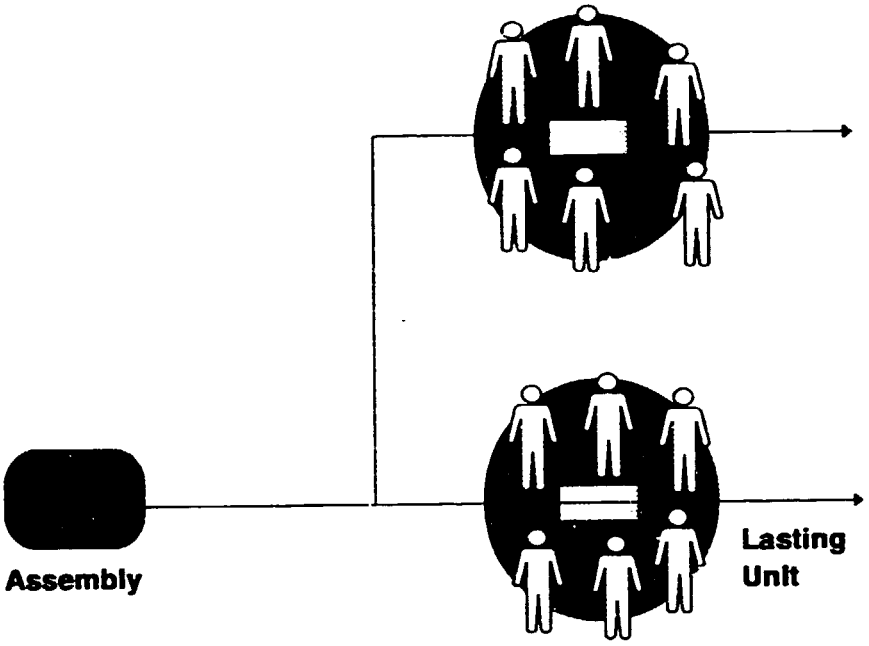
In this layout, all the necessary machinery and equipment needed to make a given product is set out in the same area, and in the sequence of the manufacturing process. This layout is mainly used, where there is a demand for one or several products that are more or less standardized. This type of system is also used extensively in the Footwear Industry.



Group production processes

Production systems are now constantly being introduced which are operated by a group of workers. The group operate on a specific product or part of a product. The machinery and equipment needed is available. Generally the operatives distribute the work among themselves and usually interchange jobs.

This process is gaining in importance because it reduces considerably the amount of time required to manufacture shoes from Cutting to Boxing.



Rink Systems

Rink systems have been in use for some time now, and the system is constantly improving. They are being used increasingly in the Footwear Industry.

One of the important factors in using this type of system is to ensure that the minimum number of styles should be used, to avoid disruptions.

It is normal for the operation of Cutting to be performed in batches of 10 pairs to 80 pairs. One of the advantages is that more economical cutting can occur.

There are two main types of systems used in Closing. Team and Toyota. The Team module may comprise up to eight operatives. The work is passed along in small trays. Each tray may have one pair only. The balancing of the work load is usually worked out by the group. It is necessary for the operatives to be highly versatile in many of the operations, to enable them to change jobs when necessary.

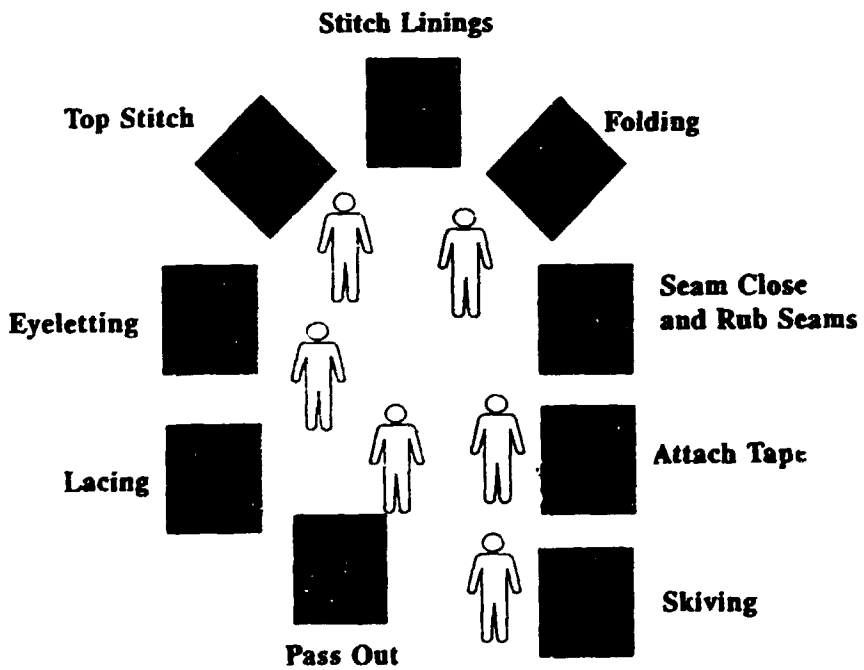
With the Toyota type module, the operatives in the Closing department stand rather than sit. Normally they move around the machines to a plan produced by the group. These are short and long cycle jobs, and the working formula is agreed by the group. There is considerable flexibility of working within the system.

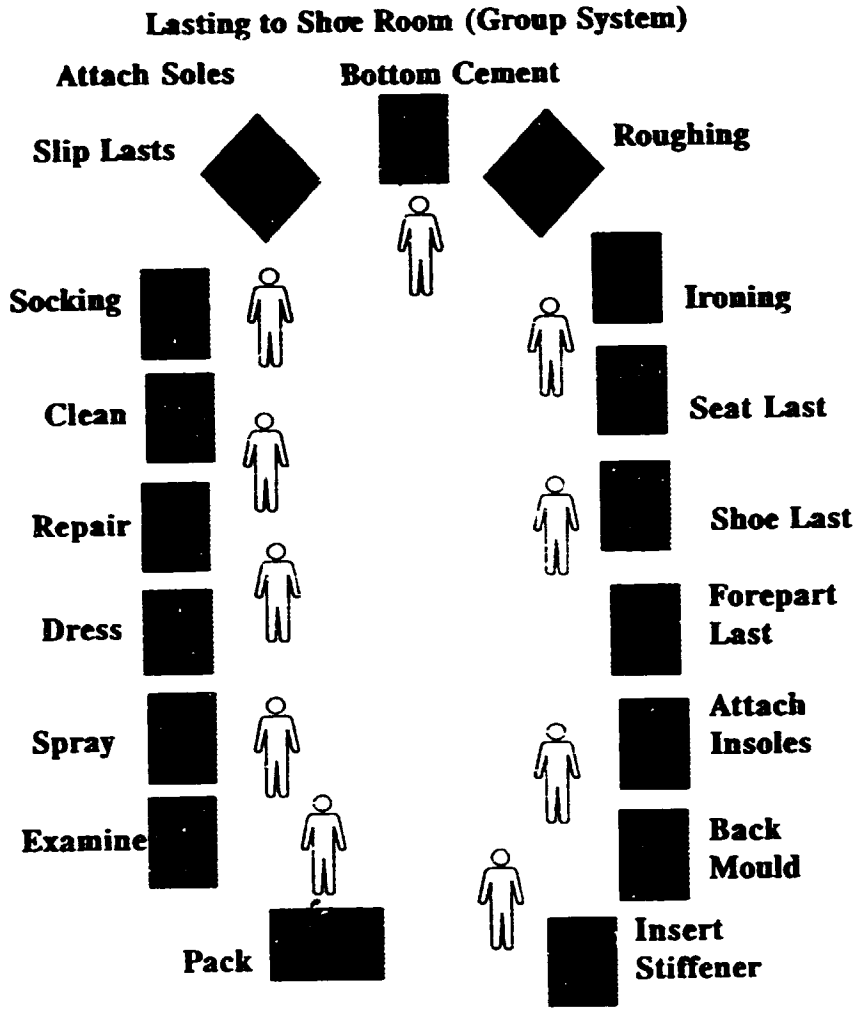
There are many advantages to such systems including a reduction in work in progress, and improved quality standards.

In the lasting departments, the shoes can be processed direct from insole attaching to boxing. Normally it is more practical to handle one pair at a time, either by a handling device, as from person to person by hand.

Illustrations of different types of flow between operations, including a multi-storey building.

Closing Room Group System




Lasting to Shoe Room (Group System)
Attach Soles
Bottom Cement
Slip Lasts
Roughing
Socking
Ironing
Clean
Seat Last
Repair
Shoe Last
Dress
Forepart Last
Spray
Attach Insoles
Examine
Back Mould
Pack
Insert Stiffener

THE ROLE OF MANAGEMENT

One of the priorities of managing is to achieve success through the work of other people. In industry today, in production units, in training centres, in design studios and offices, many people are involved, working in units to achieve the specified targets. Each team is supervised by one person, and this person is a manager whether it is as a charge hand, foreman, design section leader or director. They will contribute to the success or failure of the team and consequently the entire company.

Unfortunately in the current industrial structure, managers do not always have an opportunity to be trained in management techniques prior to their appointment. You may not be told who you are responsible to, or what you are meant to do, or how much freedom you have to make decisions. Responsibilities are so often unclear, and job descriptions are not always available.

A manager, irrespective of whether he is a charge hand, supervisor, foreman, or factory manager, will not be successful, unless he understands exactly what is required on the job.

In this session, each person will have an opportunity to examine their roles, and to discuss in detail the skills required to perform efficiently and competently as a manager.

What is the specification for your job?

1. Are you aware to whom you are responsible?
2. Are you clear on what your job entails?
3. Upon promotion, did you receive a job specification setting out the areas of responsibility?
4. Were you informed of what your areas of responsibility were?
5. If not, what action did you take to obtain details?
6. What are your targets in relation to:

    a. Production forecasts
    b. Material gains
    c. Quality targets
    d. Reduction in costs
    e. Training
    f. Machine control

7. Are there any reasons that will prevent you from obtaining your targets.

Are you performing as a Manager?

1. Are you actively involved in the following areas:

   a. Are you operating with a production plan which specifies the daily requirements?

   b. Is your advice, sought when the input is being planned?

   c. Are there problems involved in obtaining the specified production output?

2. If there are problems, what action have you taken.

   Can you provide some examples:

3. Are you issued with an arrears report daily, clearly defining the orders that are now behind schedule.

   If there is a report, what action do you take?

   If there is no daily report issued, are you aware of what the arrears are?

   What system is in use to obtain this information?

   Are you aware of any "customer arrears"?

   How do you obtain this information?

   What actions do you take as a result?

4. Are you satisfied that you have all the resources necessary to achieve the required output?

   If not, have you taken any action in relation to this problem?

   Are you confident that the labor force is capable of coping with any increase in sales?

5. Are any extra costs incurred in manufacturing the shoes?

   If so, what action have you taken to eliminate the problem?

6. What type of quality system is in use?

   How effective is the system?

   Are any shoes produced at sub quality standard?

   What action are you taking in this area?

7. What process time is required to manufacture the shoes from Clicking to Shoe Room?

   What steps have you taken to reduce the time required?

A Productive Approach to Time

1. Time is one of the manager's most different problems to control, as there never seems to be enough of it available. If a manager encounters problems in organizing his own time, he will have difficulties in organizing other people's time.

2. There are a number of rules which the manager should adhere to in operating more effectively.

    a. Application of a more efficient approach to the job.
    b. Elimination of work that can be performed more efficiently by people already employed by the company.
    c. Time is extremely valuable, and a more efficient approach towards the use of it should be sought.

The manager should constantly appraise his performance in terms of spending time efficiently.

An effective method of eliminating unnecessary work is to record daily for one week, each activity that he has been involved in, the results should be clearly analyzed.

Each activity should be studied in detail. A number of questions can be raised.

1. Can the activity be performed as efficiently by other people?
2. Is the activity necessary? Can the information be obtained in some other way?
3. Do you spend time on occasions operating on office work that could be as efficiently performed by the secretary?
4. If the activity is related to the actual manufacturing process, can the activity be performed by the supervisor as by operatives already employed on this process?
5. Visits to the Managers office should be arranged by appointment?
6. Supervisors should contact the manager only when problems cannot be resolved by themselves. The manager should ensure that these procedures are maintained.

The manager, prior to his appointment, may have been employed in one of the following areas:

a. Designing
b. Costing
c. Production Planning and Control
d. Material Supplies
e. Quality Control
f. The Manufacturing Process

It is always a natural tendency for the manager to revert back to his previous role, in which he probably was extremely efficient. The manager needs to act cautiously in this area. Although advice is always welcome, care is required to ensure that his replacement is not stifled, and that he is allowed to expand and develop fresh approaches to the job.

The manager needs to examine critically the time spent in those areas. His withdrawal from active participation may improve the performance of his team.

That is not to suggest, however, that the manager should withdraw permanently. It is important that he visits each area daily for a short period, to demonstrate that he is still very much involved and to advise where necessary.

However, it is also important that he arranges a meeting with his staff weekly, to discuss progress for the previous week and plans for the following week.

Motivation

One of the most important ingredients of any company policy is that of staff motivation. This is a company policy which in effect persuades the staff to operate in a willing and enthusiastic manner to achieve the required results.

In the initial instance, it is important that the company recognizes lack of motivation wherever it exists. Often this, is evident in a number of ways. Low moral can occur through poor planning which creates constant bottlenecks and low productivity. Poor time keeping occurs and the quality standards deteriorate. Excessive overtime tends to reduce motivation. In those conditions, people tire easily. Conflict within the work teams and with management occur. Inflexible attitudes develop.

To increase motivation it is important that good working conditions prevail, and that nay obstacles that prevent people from working efficiently are removed. Manufacturing problems need to be reduced to a minimum, and workers should be given the opportunity to perform to a high standard.

People can normally be expected to operate efficiently, if the financial reward received for their efforts is fair and acceptable.

Management should recognize the efficiency of the work force and individuals should be complimented when they perform efficiently.

It is also necessary to ensure that between management and workers, there is a feeling of mutual trust. This is an area that constantly needs to be worked at.

Delegating

Many managers are reluctant to delegate. They are of the opinion that the job will not be performed efficiently.

The shrewd manager, however, will delegate more and more as it becomes clear, that the work being delegated is being performed efficiently. It may take some time to reach the efficiency required, and obviously a training period must be allowed.

In the final analysis, the confidence of the team will be increased, and there will be an improvement in the competence of the team.

The manager takes a calculated risk when delegating. However, the advantages are such that the manager who ignores them misses out on a great opportunity.

The advantages are:

1. Delegation allows the manager to concentrate on those aspects of the job which require his personal experience, skill and knowledge.
2. A manager's job should be concerned with planning the future rather than organizing the present. If the manager is not planning ahead, he will be reacting to events as they occur, instead of anticipating them. Delegating enables you to look ahead, and anticipate problems in advance.
3. Delegation is often the best of all possible ways of training the staff for increased responsibilities.

The Art of Negotiating

Negotiation usually arises out of a conflict of interests. The customer will always attempt to purchase the product at the lowest price possible, and the manufacturer will endeavor to obtain the highest price that is attainable. Usually there is a compromise.

One of the aims of negotiation is to obtain a result which will satisfy both parties. This is necessary to enable both parties to work together in the future without any feelings of animosity.

It is necessary for the company to develop the issues for discussion prior to negotiation.

1. What will the company settle for in the final analysis?
   a. Most ideal agreement.
   b. Least favorable agreement.
2. Points that may be raised by both Company and Union.
3. Concessions that may be necessary for both groups.
4. Arguments to support company case.
5. Strengths and weaknesses of Company case.
6. Strengths and weaknesses of Union position.
7. Effects on Union if they receive no concessions.

During the negotiation process, certain rules normally apply. Anticipated that in the final analysis, a settlement acceptable to both parties will occur.

1. Offers and counter offers occur
2. Firm offers must be adhered to
3. During the negotiating period private discussions often occur between representatives from both sides. Those private discussions are not referred to during the official negotiating process.
4. A typed agreement should be produced when all of the items have been agreed.

During the process of discussion, the following rules apply:

1. Company case stated (more concessions sought than may be obtained).
2. Allow ample time for Union case to be discussed.
3. Non committal attitude towards union suggestions.
4. Challenge union position with questions and comments.
5. Assess the degree of bluff association with Union case.
6. Constantly state strength of company case and reasons, why this is so. Change of voice on occasions, sometimes in low tones but firmly. Louder tones on other occasions.
7. Avoid being abusive.
8. Do not finalize the agreement, until all of the issues have been agreed.

TOTAL QUALITY MANAGEMENT

The concept of TQM or Total Quality Management is not new. The idea originated in Japan, but it has been functioning in America since the early seventies. However, it is a fairly recent innovation in relation to the Footwear Industry. Nevertheless, more and more footwear companies are now becoming involved in this modern process.

In the old traditional sense, there were two different groups, management and workers. Management, it was assumed , were there to manage, plan, and to make decision. The workers were employed to carry out the instructions and to manufacture the products. There was little management training and less "operative training" programmes.

However, this is now beginning to change.

TQM companies operate with values that constantly aims towards manufacture of products that bear the hallmark of "customer satisfaction". It is a process that encourages management and workers to believe that their livelihood utterly depends upon satisfying the customers. In such circumstances, it is necessary to achieve all of the commitments. It also implies that the aims must be realistic. The system encourages an environment, where there is a feeling by everyone in the company of quality ownership. People get on with the job, instead of being dependent on others.

It is required at regular intervals to examine the progress in all aspects of the manufacturing process. It offers an opportunity to review the current strategies, and to adjust or change direction where necessary.

It raises a series of questions. The answers to those questions may assist Management in determining what steps need to be taken in their company to move towards a Total Quality Structure.

Market Segment

In assessing the needs of the market, there are a series of questions which are constantly examined:

a. How are the needs of the market assessed?
b. How often are you in contact with the retailers that you manufacture shoes for?
c. Do they provide you with the designs for manufacture?
d. If so, where are the designs or styles obtained?
e. Does the company employ a designer and pattern cutter?
f. Does the company produce the initial designs?
g. Where are the initial styling ideas obtained from?
h. Do you examine the shoes being sold in the market place?
i. Do you obtain any ideas from abroad?
j. What market exposure does the designer receive?
k. Is there any opportunity for him to travel abroad?
l. Do you have compention from imports?

m. Do they compare in price with local production?

n. Do they compare in quality standards?

o. Do you deliver orders to customers on the specified day?

p. If not, what are the problems that prevent you from doing so?

q. Do you discuss the "successes and failures" with the operatives?

It is necessary to continuously assess the needs of the market, and to ensure that the company is manufacturing the type of shoes that will sell readily. This is of paramount importance, and the company must ensure that the correct products, with up to date designs, are delivered in time. There is need for and efficient customer service. Of course, to deliver shoes to the customers at the specified time, it is necessary to have efficient development programmes that result in "problem free products" and "designs". The product development department should have sufficient time to develop each design to fit the last correctly, and to be manufactured without difficulties. It is also important that besides the sample size, a series of pathfinder sizes are also tested. Both supervisors from the production unit and personnel from the Pattern Development Section, should be involved in the discussions that occur, when the tests have been completed. It is encouraging to note that in some companies, one or two key operatives also attend the meetings. This is an important advance, because operatives who were involved in the manufacturing of the pathfinders, will obviously be aware of any problems that have arisen. It also assists in promoting the feeling of "quality ownership".

Cost Structure

It is evident from the cost sheet provided, that it is quite detailed in all aspects of a shoe cost.

- Does the company employ a costing clerk, or is the Manger responsible for costing shoes and setting prices?
- Do you cost shoes in a similar manner to the cost shown?
- Do you use the "comparison method" e.g. styles or design that appear to have the same materials and work content are placed in the same price bracket. This is known as the "trusting by experience method". There are many problems associated with this method.

By using the type of detailed cost that has now been presented, there are many obvious advantages.

An accurate upper material cost can be obtained, by measuring each different component to obtain the exact material allowance.

An average, the cost of upper materials can account for 35% of the total cost of a pair of shoes. The possibilities of financial savings and reduction in costs is greater in this area than on any other single item of cost.

COST SHEET

UPPER MATERIAL

ITEM	CODE NO.	ALLOWANCE	PRICE US$	COST (1 PAIR) US$
Upper Leather	100	1sqft	1.00	1.00
Vamp Lining	101	0.4sqft	0.50	0.20
Counter Lining	102	0.2sqft	0.50	0.10
Dupont	103	0.2sqft	0.10	0.02
Felt Bottom Piece	104	0.25sqft	0.10	0.025
Sock	105	0.4sqft	0.50	0.20
Vamp and Quarter Backer	106	0.6sqft	0.40	0.24
TOTAL COST OF UPPERS				1.785

COST SHEET

BOTTOM MATERIALS

ITEM	CODE NO.	ALLOWANCE	PRICE (US$)	COST (1 PAIR) US$
Sole	120	0.5sqft	0.80	0.40
Insole	121	1 pair	0.20	0.20
Top piece	122	1 pair	0.10	0.10
Heel	123	1 pair	0.50	0.50
Stiffener	124	1 pair	0.15	0.15
Shank	125	1 pair	0.10	0.10
TOTAL COST OF BOTTOM MATERIALS				1.45

COST SHEET

GRINDERY MATERIALS

ITEM	CODE NO.	ALLOWANCE	PRICE US$	COST (1 PAIR) US$
Clicking Grindery	140	1 pair	0.04	0.04
Clicking Adhesive	141	1 pair	0.02	0.02
Closing Grindery	142	1 pair	0.02	0.02
Closing Adhesive	143	1 pair	0.01	0.01
Making + Shoe Room Grindery	144	1 pair	0.02	0.02
Making + Shoe Room Adhesive	145	1 pair	0.02	0.02
Toe Puff	146	1 pair	0.03	0.03
Tape	147	1 pair	0.01	0.01
Threads	148	1 pair	0.01	0.01
Box and Label	149	1 pair	0.30	0.30
Tissue Paper	150	1 pair	0.01	0.01
TOTAL GRINDERY COSTS				0.49

COST SHEET

LABOUR COSTS

ITEMS	CODE NO.	ALLOWANCE	PRICE US$	COST (1 PAIR) US$
Clicking Dept.	200	1 pair	0.30	0.30
Closing Prep Dept.	201	1 pair	0.20	0.20
Closing Dept.	202	1 pair	0.25	0.25
Components Dept.	203	1 pair	0.20	0.20
Making Dept.	204	1 pair	0.20	0.20
Shoe room Dept.	205	1 pair	0.10	0.10
TOTAL LABOUR COSTS				1.25

Factory Overheads

	US$
1. Premises Rent	1,000
2. Premises Costs	5,000
a. Cleaning	
b. Cleaning Equipment	
c. Security Services	
d. Premises (Repairs and Maintenance)	
e. Rates	
f. Insurance	
3. Electricity and Gas	3,000
4.Depreciation	2,000
5.Management Costs	20,000
6.Maintenance	10,000
7.Product Development Costs	8,000
8.Quality Costs	7,000
9.Productions Control Labour Costs	8,000
10.Material Labour Costs	3,000
11.Personnel Officer	4,000
12.Administrations	5,000
13.Insurance	5,000
14.Post, Telephone, etc.	4,000
15.Transport	2,000
16.Stationary	3,000
17.Travelling Costs	20,000
18.Interest, Charges	
TOTAL:	110,000

Overhead Costs

Cost of Overheads	=	US$110,000
Forecasted Shoe Sales	=	US$ 55,000
Overhead Cost per pair	=	US$ 2

PRIME COSTS (ONE PAIR)

	US$
TOTAL UPPER COSTS	1.785
TOTAL BOTTOM COSTS	1.450
TOTAL GRINDERY COSTS	0.490
TOTAL LABOUR COSTS	1.250
TOTAL PRIME COSTS	4.975

	US$	
PRIME COSTS:	4.9750	(one pair)
OVERHEAD COSTS:	2.0000	(one pair)
TOTAL:	6.9750	
PROFIT MARGIN (10%):	.6975	
TOTAL COST:	7.6720	
WHOLESALE/RETAIL MARGIN (25%)	1.9181	
RETAIL PRICE:	9.5906	(9.6)

Cost Cutting Exercise

Cost reductions in leather allowances will obviously depend on the cost of materials.

The difference between a "whole cut" and "3/4 cut and quarter" plain court shoe, because of the improved interlocking of patterns, can reduce the cost by US$0.25.

The difference between a ½" lasting allowance and 3/4" lasting allowance can amount to US$0.05.

Toe puffs and stiffeners which extend over the lasting edge by 5/16" can cost US$0.01 extra.

A sole that is 1/4" wider than specified can cost US$0.02 extra.

A sock pattern that is 5/16" wider than the shoe can cost US$0.01 extra.

In the initial instance, it is necessary to ensure that the materials which are received from the tannery, match the quality grades specified in the first instance.

Leather is assessed for a particular shoe by marking off all areas on a skin, which are not suitable for the particular design. It is important that the leather assessor is familiar with the pattern construction of the shoes, and the limits of quality to which it may be cut.

In setting up the coefficient for a particular shoe from a specified leather, it is usual to take six skins from each of three bundles (18 skins). The unusable areas of the 18 skins are totaled and expressed as a percentage of the total area of the skins, which result in an average coefficient.

Before the leather allowance for the job is finalized, it must be established that the feetage of material quoted by the tanner is correct. This is usually performed by measuring sample lots of skins on the Turner Pin Wheel Measuring Machine. As stated earlier, the actual feetage is expressed as a percentage of the Tanner's feetage. The resulting percentage is known as the Tanner's Discrepancy.

The cutting coefficient is adjusted by this percentage, and this is known as the issued coefficient..

Obviously the established pattern allowance will now vary according to the issued coefficient. On a leather with a 95 coefficient, the increase would amount to 5%. If used on a leather with 70 coefficient, the pattern allowance would increase by 30%.

It is also important that accuracy is obtained in assessing the pattern allowance. Pattern assessment is used to determine the quantity of material that will be required, in order to cut from 100% usable materials, those patterns which combine to form a shoe.

The following rules must be followed in laying out patterns:

1. The pattern must not be turned over.
2. The positions of the patterns must be as close together as possible.
3. The relative positions must be either the same or exactly 180° opposite.

Each pattern is marked up separately, the closest possible interlocking system being used. After marking the first pattern, the second is rotated through 180° without being turned over and interlocked. This procedure is repeated until there are at least eight patterns marked, four in each of the two positions. Connect four corresponding points on the four patterns in the same position, and the area of the parallelogram thus formed will equal the basic cutting area of two patterns. The shaded sections will fit together to form two whole vamps.

1. Pattern Area - That is the actual net areas of the individual pattern pieces, comprising the sample upper.
2. Interlocking or First Waste - That is any space left between the two pattern pieces, when interlocked together due to irregularities in shape.
3. Second Waste - That is the waste, additional to the interlocking waste or first waste, due to factors such as:

Normal leather characteristics

1. The shape of the skin to be used, because the pattern shapes, however fitted together, will not coincide in outline with that of a skin.
2. The size (and area) of the skin in relation to the size of the individual pattern shapes, since the larger the area, the smaller the waste, and the smaller the area, the larger the waste.
3. General shoe making considerations, in that certain parts have to be cut from certain portions of the skin and in certain directions, according to the direction of stretch or so that shades of color match in individual pieces, as a result of which the interlocking arrangements may be destroyed.

Cutting Department

A ticket should accompany each job that is issued to the manufacturing unit, determining the amount of material specified for the job and the amount of material returned to the Leather store upon completion of the job. It is also necessary to ensure that the materials entering and leaving the leather store are recorded. The performance of each cutter can be assessed if this information is available.

In general terms, material saving should amount to 4% to 6% depending on the quality of the material. This depends on a number of issues. It is important that the graders in the leather store are sufficiently skilled to differentiate between the quality of leather grades 1, 2, 3, 4, and that these variations are taken into account, when assembling the material prior to cutting.

Production Processes and Productivity

Efficient, well structured operations, with the minimum of handling, blend readily with high productivity. During the discussions on Work Study, it was evident that it is possible in many instances to eliminate unnecessary parts of the job. It is also possible to combine some of the operations, or rearrange the sequence of operations for more effective results. Consequently the operation is simplified and productivity can be increased.

The basic procedures are quite simple, as stated during the "Work Study" discussions.

1. Select the operation or operations that are creating the bottlenecks.
2. Record all the relevant facts about the present method by direct information.
3. Examine these facts critically, and in ordered sequence.
4. Develop the most practical, economic and effective method.
5. Define the new method, so that it can always be identified.
6. Install that method as standard practice.
7. Maintain that standard practice by regular routine checks.

Inefficiencies exist in the methods being used to perform many of the operations in all of the departments.

In terms of TOTAL QUALITY, it is necessary to examine:

1. Existing layouts
2. Each operations within the production unit to assess whether modifications can occur in the methods being used.
3. Examine the possibility of combining certain operations as part of operations.
4. Examine the productivity performance within the plant. Is your company operating at a 67, 100, 133, or 167 rate.

Total Quality and High Productivity go hand in hand.

Labor Costs

In small and medium-sized companies, it is normal for a fixed wage rate to apply. usually a specific number of people are employed and bonus rates may apply in some instances. Occasionally, it is necessary to work extra hours on overtime.

However there are disadvantages to this system. If less shoes are being processed than is normal, or if the work content on some of the designs is low, particularly in the Closing Department, it is normal in those conditions for the operatives to adjust the speed of working to a lower rate. Obviously, if such a situation existed, labor losses would occur.

Many of the designs vary in work content. If the amount of labor time required for each style is known, it is also possible to assess in advance, the actual time required to manufacture the entire weekly input of shoes.

Machinery and Equipment - Efficient Maintenance Systems

All too often, production targets have not been achieved because of faulty machinery and equipment. This often occurs due to lack of spare machinery parts, and an inefficient maintenance system. Many problems exist in a large number of companies and many difficulties are encountered.

Lack of machinery parts can, often for long periods, ensure that operations are performed manually, while the machines are idle. This problem can create a loss in production. Labor losses occur.

Does the company maintain a stock of spare machine parts? Are there difficulties in obtaining parts locally? Can they be obtained at point of order, or do long delays occur.

Are the maintenance staff fully trained in the repair of footwear machinery?

Is extra training required in this area?

Are the facilities available to train mechanics.

Leather and Component Store

1. Does the company employ a Material Controller?
2. Is there a stock card system in use?
3. How far in advance of manufacturing is it necessary to purchase?
4. How are the material requirements for each production input assessed?
5. Are all of the materials obtained locally, or is it necessary to purchase some items from abroad?
6. Do material shortages occur?
7. Are there problems regarding excess or redundant stock?
8. Are the materials fitted up in advance, to the daily input requirements?
9. Is there a material control system in use for the Cutting Department?
10. Is there a system in use for the control of materials in the Production unit?

Quality of Product - Quality Standards

A "Total Quality Management" system requires the commitment and skills of Management and all employees to work as a team. This is necessary for the continuous improvement of quality standards.

The quality standards must be those of the "Customer". Without customers, the production unit will not survive. There is no obligation on the part of the customer to purchase from the company. The relationship can only continue, if the quality of the product meets their requirements.

The most knowledgeable members of the team are those with the skills required to manufacture the shoes, and only they can create the improvements. But management are also involved as they provide the operatives with the tools necessary to create the improvement.

Management can assist by building quality values into company operations. It is necessary for management to provide designs that are free of manufacturing problems, and the equipment and working conditions necessary to enable the operatives to perform efficiently.

The company can create a customer oriented approach by encouraging each operative on the production line to achieve a quality standard that is acceptable to the outside "customer". Consequently, each operative represents the "customer" and his interests.

Operatives - Training Needs

One of the problems regarding the medium-sized industries relates to the assumption that it is not possible from a financial view point, to employ a training instructor or eliminator. This is partially true, but it may be possible to train one staff member to operate in this capacity in some instances.

Obviously, operatives who have not been trained correctly, will have difficulties in performing efficiently. The new entrant to the company is normally trained by an operative who is already performing the operation. All of the inefficient methods being employed by the operative are passed on to the trainee.

The system ensures that the type of inefficiency that prevails is preserved for future generations.

UNIDO is in the process of setting up a training institution for Cutting and Closing. The aim in Cutting will be to train people to cut leather pieces as economically as possible within a specific period.

The aim in Closing is to train the basic skills of sewing as quickly as is possible. Emphasis in both areas will be placed on speed combined with quality.

It is imperative that the training needs in the Lasting and Making area are examined and training programmes introduced.

PRODUCTION PLANNING AND CONTROL SYSTEM

What are the main aims of an efficient Production Planning and Control System?

1. There is need for an efficient customer service. It is extremely important that the delivery dates are adhered to. Reliability leads to customer trust. It will mean that the existing business with the customer can be maintained. It can contribute to increased business.
2. It will be a requirement that the necessary materials and components are available for the production unit. The stock of materials must be adequate at all times, but it must not be excessive.
3. It is imperative that production schedules and plans are discussed and agreed with the production departments in advance of the production input. This enables the production team to become familiar with the order requirements. It provides the staff in the production unit with an opportunity to prepare and plan in advance. It is important that the labour and machinery requirements are adequate to produce the necessary production outputs.
4. The success of a production plan depends on the product being developed correctly and in time. Obviously, the number of designs and last shapes involved, will determine how productive the unit will be.

   This can be clearly demonstrated from the available chart.
5. Consequently it is necessary for the Production Planner to obtain the necessary information regarding the work content of each design particularly in the closing section. The work content of each design on this department can vary considerably. It will also be necessary to obtain details of the work content and the time required to perform the operations of stitching and bench work.

   It must be emphasized that the information is made available during the planning process. Otherwise, planning occurs with insufficient knowledge of the structure. The Production Planner may be introducing "bottlenecks" into the system.
6. The input plan is produced for one week. The plan is produced two weeks ahead of the required date. This allows some extra time to ensure that the components and materials are available when required. The input plan is issued to each supervisor. The input is divided into five sections. Each section represents one day's input. Each day's input is numbered in sequence. The staff receive the input plan in advance of the work.

WEEKLY INPUT SHEET

INPUT FOR 5 DAYS

STYLE CODE	23	24	25	26	27	TOTAL
1000	20		50		30	100
1001	60	20	10	20		110
1002	80	60		10	30	180
1003	20	60	40	40	60	220
1004	20	40	60	40	60	220
1005	20	40	40	60	60	220
1006	20	20	20	40	20	120
1007		60		40		100
1008	50		50		50	150
1009	20	20	20	20	20	100
1010	40		40		20	100
1011	20	20	20	20	20	100
1012	20	20	20	40		100
1013		40		40		80
1014		40	60	40		140
1015	60			40	60	160
1016	20	20	20	20	20	100
1017	20	20	20	20	20	100
1018	40	40	40	40	40	200
1019	30	30	40	30	30	160
1020	40	40	40	40	40	200
1021	40	20	20	40	60	180
1022	20	30	20	20	20	110
1023	20	20	30	20	20	110
1024	20	40	40	20	20	140
	700	700	700	700	700	3500

Supervisors also receive an input plan for each working day. It contains information in relation to the style code, last, number of pairs, and the ticket number for each job.

DAILY INPUT SHEET 23

STYLE CODE	LAST	TICKET NUMBER	NO. OF PAIRS
1000	874	23000	20
1001	875	23001	20
1001	875	23002	20
1001	875	23003	20
1002	876	23004	20
1002	876	23005	20
1002	876	23006	20
1002	876	23007	20
1003	877	23008	20
1004	878	23009	20
1005	879	23010	20
1006	880	23011	20
1008	881	23012	20
1008	881	23013	20
1008	881	23014	10
1009	882	23015	20
1010	883	23016	20
1010	883	23017	20
1011	884	23018	20
1012	885	23019	20
1015	886	23020	20
1015	886	23021	20
1015	886	23022	20
1016	887	23023	20
1017	888	23024	20
1018	889	23025	20
1018	889	23026	20
1019	890	23027	20
1019	890	23027	10
1020	891	23028	20
1020	891	23029	20
1021	892	23030	20
1021	892	23031	20
1022	893	22032	20
1023	894	22033	20
1024	895	22034	20

A ticket is produced for each ticket of work. Each ticket has a number. The numbers are in sequence, e.g. 23000, 23001, etc.

TICKET

23001

2	3	4	5	6	7	8	9	10	11	12	13	1
Whole												
Half												

Ord. No.	LAST	Sizes ENGLISH	Pairs 12	Fitt.
Des. No.	Var.	Name		Shoe No.

DESCRIPTION		CUTTING
Eyelet/Zip		Heel
Button		Edge
Buckle		Finish
Binding		Sole Stp.
Last	Vp.D	
Make		Stock
Outsole		
Insole		Stock Stp.
Ins. Bkr.		
P. Form		Trim
Welt		Lace
Shank		Box
Stiff		Label
Puff		Box No.

Outputs are recorded in detail from each department. The outputs are also recorded at the Planning Department.

The Factory Day Sheet Schedule is issued to all supervisors. The Schedule specifies the date on which each daysheet is due from each department.

Day+Date	Ticket Dept.	Leather Store	Stores 05:00	Cutt.	Com.	Clos.	Ass.	Shoe Room
Mon 24/9	23	22	21	20	18	17	16	14
Tue 25/9	24	23	22	21	19	18	17	15
Wed 26/9	25	24	23	22	20	19	18	16
Thu 27/9	26	25	24	23	21	20	19	17
Fri 28/9	27	26	25	24	22	21	20	18
Mon 1/10	28	27	26	25	23	22	21	19
Tue 2/10	29	28	27	26	24	23	22	20
Wed 3/10	30	29	28	27	25	24	23	21
Thr 4/10	31	30	29	28	26	25	24	22
Fri 5/10	32	31	30	29	27	26	25	23
Mon 8/10	33	32	31	30	28	27	26	24
Tue 9/10	34	33	32	31	29	28	27	25
Wed10/10	35	34	33	32	30	29	28	26
Thr11/10	36	35	34	33	31	30	29	27
Fri12/10	37	36	35	34	32	31	30	28
Mon15/10	38	37	36	35	33	32	31	29
Tue16/10	39	38	37	36	34	33	32	30
Wed17/10	40	39	38	37	35	34	33	31
Thr18/10	41	40	39	38	36	35	34	32
Fri19/10	42	41	40	39	37	36	35	33
Mon22/10	43	42	41	40	38	37	36	34
Tue23/10	44	43	42	41	39	38	37	35
Wed24/10	47	44	43	42	40	39	38	36
Thr25/10	48	47	44	43	41	40	39	37
Fri26/10	H	O	L	I	D	A	Y	
Mon29/10	H		L	I	D	A	Y	
Tue30/10	49	48	47	44	42	41	40	38
Wed31/10	50	49	48	47	43	42	41	39
Thr 1/11	51	50	49	48	44	43	42	40
Fri 2/11	52	51	50	49	47	44	43	41
Mon 5/11	53	52	51	50	48	47	44	42
Tue 6/11	54	53	52	51	49	48	47	43
Wed 7/11	55	54	53	52	50	49	48	44
Thr 8/11	56	55	54	53	51	50	49	47
Fri 9/11	57	56	55	54	52	51	50	48
Mon12/11	58	57	56	55	53	52	51	49
Tue13/11	59	58	57	56	54	53	52	50
Wed14/11	60	59	58	57	55	54	53	51
Thr15/11	61	60	59	58	56	55	54	52
Fri16/11	62	61	60	59	57	56	55	53
Mon19/11	63	62	61	60	58	57	56	54
Tue20/11	64	63	62	61	59	58	57	55
Wed21/11	65	64	63	62	60	59	58	56
Thr22/11	66	65	64	63	61	60	59	57
Fri23/11	67	66	65	64	62	61	60	58

The Planning Department issues a weekly arrears report. The report specifies the number of tickets for each day in arrears. It also records the number of days in arrears.

"Tail of Arrears" Document

Detailed Explanation of Document

1. The document is divided into four columns. Each column represents a department in the Production Unit.
   - Cutting (Also specified as Clicking)
   - Closing
   - Components
   - Shoe Room
2. I will describe in detail how the information on the document relates to the Cutting Department. Obviously, the explanation will also apply to the other departments.
3. The "Factory Daysheet Schedule" specifies that the "daysheet folder 64" was due from Cutting on 23rd November. On the evening of the 23rd November, there were ten tickets of work still in the Cutting Department which were numbered "64". There were 12 tickets on the 63 folder, 14 tickets on the 62 folder and 16 tickets on the 61 folder. Since the 61 folder is 4 days behind the 64 folder, it is four days behind the scheduled folder (64). Therefore, the oldest ticket in the Cutting Department is four days old, or four days in arrears.
4. If you add up all of the arrears on day sheet folders, 61, 62, 63 and 64, the amount is 52 tickets. Since each ticket represent 10 pairs, the number of pairs in arrears is 520.
5. The above explanation relates to all the other departments. Obviously the day sheet number due from each department on 23/11/1986 will vary.

CUTTING 4 DAYS IN ARREARS	DAY	56	57	58	59	60	61	62	63	64
	MON	2	2	2	1	10				
	TUE	2	2	2	1	8	20			
	WED	2	2	2	1	6	18	18		
	THU		-	-	-	6	18	18	18	
TOTAL ARREARS=520 PAIRS	FRI	-	-	-	-	-	16	14	12	10
CLOSING 7 DAYS IN ARREARS	DAY	53	54	55	56	57	58	50	60	61
	MON	2	4	5	6	10	-			
	TUE	1	3	4	5	6	10			
	WED	-	2	3	2	6	8	2		
	THU	-	1	1	-	1	8	2	14	
TOTAL ARREARS=270 PAIRS	FRI	-	-	1	-	1	5	2	8	10
COMPONENTS 6 DAYS IN ARREARS	DAY	54	55	56	57	58	59	60	61	62
	MON	6	6	7	8	10				
	TUE	4	4	7	8	8	10			
	WED	3	3	6	6	7	9	15		
	THU	-	-	5	6	7	9	10	12	
TOTAL ARREARS=520 PAIRS	FRI	-	-	-	6	7	9	10	10	10
SHOE ROOM 7 DAYS IN ARREARS	DAY	50	51	52	63	54	55	56	57	58
	MON	10	10	10	9	10				
	TUE	8	9	9	9	9	9			
	WED	-	9	9	7	9	6	20		
	THU	-	4	9	3	6	4	10	10	
TOTAL ARREARS=350 PAIRS	FRI	-	-	6	3	6	4	6	4	6

QUALITY CONTROL

Quality Control has been a feature of the engineering industry, ever since the introduction of mass production techniques. Its applications as a tool of management to the footwear industry occurred somewhat later.

A recent report, in an analysis of consumer complaints about footwear, concluded that 40% of faults were due to inadequate quality control systems.

The problems were identified as the following:

1. No means of identifying potential quality problems before they resulted in an unacceptable level of rejects.
2. Insufficient development in new product ranges.
3. Lack of product specifications and quality standards.

Those problems areas will be covered during the discussion on Quality Standards.

It is also anticipated that during the course, small groups will be formed to produce quality standards for a number of operations.

Examples

A. Top stitching
   1. Correct size and type of upper lining
   2. Stitch length to be correct
   3. Correct needle
   4. Correct type and colour of thread
   5. Correct edge distance
   6. No thread tension problems
   7. No mis-stitches
   8. Lining to be stitched in correctly
   9. No distortion of upper through "gathering" or "stretching"
   10. No damage

B. Forepart lasting
   1. Vamp depth correct
   2. Vamps tight to the last
   3. Design to be central
   4. To be lasted in pairs
   5. Correct toe shape
   6. Lasting allowance secure to insole and flat
   7. Correct top line balance
   8. No creases
   9. Straight back seam
   10. Top lines to be tight to last

C. Heel Attach

1. Correct size and type of shoe and heel
2. Correct position of heel
3. Heel to be flush to seat
4. Correct type and number of nails
5. Correct pitch of heel
6. No distorted top lines
7. No damaged heels or heel covers
8. Nails flush to insole

Quality Standards — Clicking Dept.

A. Cutting Outsides

1. Correct shape and size
2. Clean edge
3. Square edge
4. Cut "tight" heel to toe
5. Correct colour match
6. Correct grain texture
7. Substance to be as specified
8. No flaws
9. Material as specified
10. No excessive stretch in material
11. No loose finish
12. No damages

Quality Control — Closing Department

A. Lining Stamping

1. Correct size of stamp
2. Size, fitting and last number to be specified
3. Stamp to be clear and distinct

B. Hand Marking

1. Clear distinct mark
2. Correct position of mark

C. Perforating

1. To be perforated as specified
2. Clean perforations
3. Correct shape of punch
4. No damages

D. Attach Backers or Plumpers

1. Plumper or backer as specified
2. To be correctly positioned

3. Correct type of adhesive

E. Attach toe puffs
   1. Correct toe puff and upper
   2. To be positioned correctly
   3. To be securely attached

F. Skiving
   1. Correct thickness of edge
   2. Correct width of scarf
   3. No damage to edge
   4. Correct angle of scarf

G. Back seam closing
   1. Correct size of components
   2. Stitched to matchmark specifications
   3. Stitch length as specified
   4. Edges to be level top and bottom
   5. No wrinkles
   6. No damaged uppers
   7. Correct needle
   8. Correct type and colour of thread
   9. Correct edge distance
   10. No thread tension problems
   11. No mis-stitches

H. Cross stitching
   1. Correct needle
   2. Correct colour and type of thread
   3. Correct width of "throw"
   4. Thread to be positioned correctly on both sides of seam
   5. Correct tension
   6. Stitch length as specified

I. Folding
   1. Correct width of fold
   2. Fold to be stuck securely
   3. Notches to be correctly positioned (1/16" from top edge)
   4. Top line tape to be applied in correct position
   5. No damaged top lines
   6. No distortion

J. Lapping
   1. Correct size of components
   2. Stitched to match mark specifications
   3. Stitch length to be correct

4. Edges to be level top and bottom
5. No wrinkles
6. No damaged uppers
7. Stitched to marks
8. Correct needle
9. Correct type and colour of thread
10. Correct edge distance
11. No thread tension problems
12. No mis-stitches
13. Correct width of lap

K. Fancy stitching

1. Stitched to mark
2. Correct needle and thread
3. No thread tension problems
4. No mis-stitches
5. Correct edge distance
6. No damages
7. No wrinkled uppers

L. Stitch on binding

1. Correct colour and type of binding
2. Correct needle and thread
3. Edge distance to be as specified
4. Binding to be flush with edge of upper
5. Stitch length to be correct
6. Correct tension
7. Correct width of binding join
8. Tape to be attached

M. Hammer over Binding

1. Correct width of fold
2. Binding to be stuck securely
3. No damaged top lines
4. No creases

N. Top stitching

1. Correct size and type of upper and lining
2. Stitch length to be correct
3. Correct needle
4. Correct type and colour of thread
5. Correct edge distance
6. No thread tension problems
7. No mis-stitches

8. Lining to be stitched in correctly
9. No upper distortions
10. No damage

O. Eyeletting

1. Eyelet as specified
2. Eyelets to be positioned correctly
3. Eyelets to be correctly clinted
4. No damage to uppers
5. No damage to eyelets

Quality Standards — Lasting and Making Dept.

A. Insert Stiffeners

1. Correct type and size of stiffener
2. Stiffener to be correctly positioned
3. Counter lining to be clear of wrinkles

B. Backpart mould

1. Correct dwell time for both hot and cold moulds
2. No damage to upper or lining
3. No creased linings
4. Correct type and size of moulds
5. To be back moulded correctly

C. Insole attach

1. Correct size and type of insole
2. Correct type and size of last
3. Insole to be attached correctly
4. Correct type and number of nails

D. Consol or Side last

1. Waists to be tight to last
2. Top lines to be tight
3. Outside top line to be 1/8" lower
4. No creases on uppers or linings
5. Tacks flush to upper and clinted properly on insole
6. Area of lasting allowance between forepart and waist to blend
7. No damages
8. Back seam to be straight and flush with b/height pin
9. Correct size of tacks
10. Correct position of tacks
11. No damages

E. Seat last

1. Correct b/height
2. Straight b/seam

3. Seat lasting allowance to be securely stuck
4. Correct type and location of tacks
5. Tight top line
6. Tacks flush with lasting allowance
7. No creases
8. No damages

F. Treeing
1. No creases or wrinkles
2. No damage to upper
3. No distortion

G. Withdraw Insole Tacks
1. Tacks to be withdrawn
2. No damage to insoles

H. Roughing
1. Roughed to feather edge
2. Grain to be removed
3. No digs or damages
4. Roughed to heel breast only when specified

I. Attach Shanks
1. Correct size and type of shank
2. Correct position of shank
3. Shank to be attached securely

J. Attach adhesive to lasting allowance
1. Correct type and amount of adhesive to be applied
2. No adhesive on non roughed areas
3. Adhesive not to extend over feather edge
4. Adhesive to be applied to heel breast only, where specified

K. Heat Setting
1. Correct temperature
2. No damage to upper

L. Sole attach
1. Correct size of sole
2. Correct size of shoe
3. Correct air pressure on sole press
4. Sole to be correctly positioned
5. Sole to be securely attached
6. Correct time dwell

M. Slip lasts
1. Last to be removed
2. No damage to upper

N. Heel attach

1. Correct size and type of shoe and heel
2. Correct position of heel
3. Heel to be flush to seat
4. Correct type and number of nails
5. Correct pitch of heel
6. No distorted top lines
7. No damaged heels or covers
8. Nails flush to insole

Quality Standards — Shoe Room

A. Attach Socks

1. Correct type and size of sock
2. Correct amount of adhesive on sock
3. Correct position of sock
4. Sock to be securely attached
5. No adhesive on lining as upper

B. Clean uppers, soles and linings

1. No dirt or adhesive on shoes
2. No damage to shoe
3. No distortions of shoe

C. Attach filler

1. To be evenly applied
2. No surplus filler on lining
3. Correct type of filler

D. Repair shoes

1. Damaged areas to be repaired
2. Correct colour of repair material

E. Attach trims

1. Correct size and type of trim
2. Trim to be securely attached
3. Trim to be correctly positioned

F. Apply Dressing

1. To be evenly applied
2. No dressing on lining
3. Correct type of dressing

G. Quarter Mould

1. No damage to upper
2. Top line to be shaped correctly.

Forepart Lasting

Quality Standards and Manufacturing Problems

1. Vamp depth correct

   During the production of the design and patterns, emphasis is placed on the fit of the shoe. Fitting tests are carried out, and the vamp depth is an important feature during the fitting trials. The length of the vamp is clearly defined and specified.

   Details of the vamp depth for each design are detailed on each work ticket. The specification for the model size is recorded. There will be an increase of 1/16 in vamp depth for each half size above the model size. Obviously there will be a decrease of 1/16 for each 1/2 size below the model size.

   If the vamp depth is too long, particularly on a court shoe, the top line at the forepart area will cause discomfort. If it is too short, an ill fitting shoe will result.

2. Vamps tight to the last

   It is important for fitting purposes, that the vamp of the upper is lasted tight to the last. Loose vamps will also create wrinkles, when flexing the shoe during the walking process. A wrinkled vamp looks unsightly. A loose vamp does not conform to the shape of the last. The appearance of the shoe is affected, and the design loses its soles appeal.

   a. The lasting allowance should be a 1/2 in width to ensure that the vamp is lasted tight to the last. An excessive lasting allowance may prevent the material from being lasted light to the last.

   b. Difficulties are often envisaged, when toe caps, vamps, wing caps, aprons, or quarter facings are sewn in such a manner, that it is difficult to last the material tight to the last. This can be caused in a number of ways.

      (i) The mark positions for stitching the components together may be incorrect due to faulty markers being produced in the development section;

      (ii) Due to careless marking, or the sue of an incorrectly sized marker.

      (iii) Due to incorrect positioning by operatives at the saving operation.

   c. The forepart lasting machine must be adjusted properly to ensure that the last and insole are pushed up at a controlled rate into the upper, thereby ensuring that the upper is tight to the last. The pincers must not release too soon before the final wiping action of the heated plates.

   d. The upper, lining and toe puff must be combined properly, ensuring that no pockets or creases exist.

3. Design to be central

   It is the responsibility of the laster to ensure that the design is central to the last, or vamp.

a. A crooked design can be caused by varying widths of lasting allowance;

b. It can occur through excessive stretching of the vamp at lasting;

c. The problem can also be caused because of inferior material that stretches easily;

d. Varying widths of laps, or a crooked back seam can also assist in creating the problem;

e. A punched design may have been marked incorrectly in the first instance, or perforated incorrectly;

f. Similarly, a stitched design may have been marked incorrectly or stitched off the marks.

4. Lasted in Pairs

a. The problem may be caused by the lasting operative. It is important that the upper is positioned in the machine correctly in the first instance.

The principle is that the upper is held by a number of machine pincers. At the initial draft, it is possible to adjust the pincers where necessary, to straighten the vamp;

b. Some lasts are marked either at the vamp point or along the front cone profile. This assists the operative in lasting the shoes as pairs;

c. A crooked "throat" can be caused by poor cutting, which creates inaccuracy;

d. If the material is of a low quality standard, it may stretch in unpredictable ways;

e. If the material is cut loose "heel to toe", problems can also occur;

f. If the material is of a low grade, as cut loose heel to toe, the folding operation at Closing, will emphasize or distort the shape further;

g. Problems may also have occurred through varying widths, of laps, excessive trimming at back seam closing or distortion at top stitching;

h. Distortion at top stitching can easily occur because the lining should be "eased" in while top stitching the upper. The lining should never be gathered or stretched because it causes distortions, and can be one of the reasons why it is difficult to pair up at lasting.

5. Correct toe shape

a. At forepart lasting, the teflon coated toe band holds the toe securely, while heated wipes plates enable the lasting allowance to be securely attached to the insole. Obviously it is clear that the teflon band and lasting plates and pincers must be similar in shape to the forepart shape of the last, to ensure that the correct shape is produced at lasting;

b. A distorted toe shape can also occur if the insole is not a similar shape to the bottom shape of the last;

c. If the insole is protruding over the edge of the last, the shape will be distorted and the upper will not be tight to the last. Distortion of the insole will also occur, resulting in a poor feather line;

d. If the upper allowance is too tight, there will be insufficient material to produce the shape required;

e. Excessive lasting allowance will cause bulkiness, insecure attachment and poor shape;

f. If the upper, lining and toe puff are not combined together properly, difficulties will occur;

g. Insufficient adhesive on the lining allowance, will also result in the upper being insecurely attached, thereby creating a poor or distorted toe shape;

h. The profile of the last in the forepart needs to be correct;

i. It is suggested that the perfect feather line can best be obtained when the insole shape is 1/64 smaller than the last bottom shape.

6. Lasting allowance secure to insole and flat

a. Excessive lasting allowance can cause pleats and bulkiness. To achieve the desired results, the lasting allowance needs to be 1/2 as specified;

b. If the upper, lining and toe puff materials are heavier than specified, it may be necessary to skive the lasting edge;

c. If the lining material finish is "smooth", it may cause problems in attempting to obtain a permanent bond. In this instance, it will be necessary to rough the lining lasting allowance;

d. If the materials are not combined securely at the lasting allowance, a flat bottom may not result;

e. If sufficient adhesive is not applied to the lasting allowance area, a secure bond will not occur;

f. The final pressure of the forepart lasting plates, which assists in ensuring that the lasting allowance is flat to the insole, should occur for the specified pre set time;

g. The temperature of the heated plates must be as specified.

7. Correct top line balance

The outside ankle bone is lower than the inside one. Consequently it is necessary to ensure that the outside quarter is 1/8 lower than the inside quarter at the ankle position.

Incorrect to line balance can be caused by various problems.

a. It can be caused by an incorrectly shaped pattern;

b. If the pattern is tight, excessive stretch can distort the top line;

c. Low grade material on quarters, or quarters that have been cut loose heel to toe can cause excessive stretch and top line distortion;

d. Varying widths of top line fold on quarters can also contribute to the problem;

e. Damaged quarters at skiving can create a problem if quarters are reshaped by trimming;

f. At back seam closing, if the edges are not sewn level at the top of the quarters, incorrect top line balance can occur. A similar situation may arise at quarter seam closing or at quarter lapping;

g. It is essential that the operative ensures that the top line balance is produced correctly at forepart lasting. Under normal circumstances, any required adjustments can be performed on the forepart lasting machine to obtain the specified top line balance;

h. If the counter lining pattern is incorrectly shaped with "excessive" pocket or space between the counter lining and back part, distortion of the top line can occur at lasting.

8. No creases

a. Of course, it is necessary at forepart lasting to ensure that the machine is adjusted properly and that the teflon coated toe band and toe and side pincers conform with the shape of the last;

b. The preparation of the upper must be thorough and upper lining and toe puff must be combined and secure. The lining lasting allowance must be roughed if necessary to secure a good bond. The correct amount of adhesive needs to be applied;

c. The upper must be conditioned properly to ensure that the material is pliable and will last readily without creating creases;

d. The toe puff must also be conditioned properly, either by heat or solvent, depending on the type of toe puff. The toe puff must be pliable enough to conform to the last shape without creating creases;

e. The pattern cutter must produce a pattern that fits correctly on the last;

f. Excessive lasting allowance, can create pleating and creasing problems;

g. Low grade material, material that is lighter in substance than specified, material that has been cut loose heel to toe are problem areas, that can contribute to creasing during lasting;

h. A lighter substance material will require a backing or plumping material to provide the required substance.

9. Straight back seam

a. It is necessary at forepart lasting for the operative to ensure that the upper is positioned correctly and in line with the back height pin, prior to presenting the upper and last to the machine. When the initial pressure is applied at lasting, and the pincers grip the material, an examination of the back seam should occur. Any adjustments that are necessary at that stage, should be made;

b. Low grade material, or material that is cut loose "heel to toe"may stretch during lasting, and cause the back seam to swing to one side. On a folded or bound top line, the distortion may have occurred originally at the folding or run on binding operations;

c. If the upper material is light and has not got a plumper or strengthening agent, there is a possibility that the back seam may swing to one side;

d. At stiffener insertion or at b/moulding, the back seam may not have been placed in a central position, in relation to the stiffener or lining;

e. A topline without a strengthening tape, may stretch in unpredictable ways, and cause the b/seam to move away from the central position;

f. A lapped seam may have a width that is narrower or wider than the specified width. This can create a crooked back seam problem;

g. Varying edge distance at seam closing will create problems;

h. A lack seam that has not been rubbed down properly, or has not been strengthened by the addition of a tape, may swing to one side at lasting.

10. No damages

a. Excessive stretching at forepart lasting can cause material breakages at toe. It can be caused by placing excessive material in the pincers at the initial stage of lasting as by incorrect adjustment;

b. Material breakages can occur, if the material has not been mulled or conditioned prior to lasting;

c. Excessive heat during the conditioning process can cause breakages at lasting;

d. A short upper or "tight lasting allowance" can create a material breakage at lasting;

e. Sharp edges on the pincers or lasting plates can damage or mark the vamp during lasting;

f. If the machine is incorrectly adjusted, or the upper and last are incorrectly positioned, the upper can be marked by the wiping plates during the lasting process;

g. Excessive heat on the wiper plates may also remove the finish of the upper material at the feather line;

h. Breakages can occur if the sewing operations have not been performed correctly;

i. Breakages can occur if the material has a low breaking strength;

j. Care must be taken to ensure that the material used on the forepart lasting pad is smooth. If the material has a rough finish it may damage the vamp of the shoe on contact.

THE CONSULTANCY KIT

Marketing and Fashion Trends

1. How do you assess the needs of the market?
2. Are you constantly aware of the market requirements?
3. How is this information obtained?
4. How often do you visit footwear retailers?
5. Do you listen carefully to their comments?
6. Do you examine in shop windows your competitors' products within your specified market?
7. Do you have knowledge of your competitors' achievements within that market?
8. Are you aware of world fashion trends?
9. How do you obtain this information?
10. Can you incorporate those world fashion trends within your range while retaining the local requirements?
11. Do you receive any of the footwear magazines that are available on the market?
12. Do you purchase any of the international fashion magazines on a regular basis?
13. Do you visit any of the shoe fairs in Europe or South East Asia?
14. Does the stylist or designer visit those areas?
15. Are you aware of the current trends both overseas and locally in relation to last shapes, leathers, components, and sole units?
16. Are you constantly looking for a niche or vacuum in the market that can be exploited?
17. Are you operating in the correct price bracket in terms of profitability?
18. Is it possible to exploit markets in other price brackets?
19. Do you manufacture an excessive numbe rof designs which encourages low productivity?
20. Is it possible to reduce the number of designs without affecting sales?
21. Are you operating with an excessive number of shoe constructions?

Product Development

1. Do you produce patterns that fit accurately?
2. Do you maintain the specified lasting allowance?
3. Do you ensure that the patterns interlock as efficiently as is possible within the constraints of the design?
4. Do you have "material allowance guidelines" for each price bracket?
5. Do you have "labour allowance guidelines" for each price bracket?
6. Is there a specified material cost allowance for each price bracket?

7. Is it possible to reduce the number of shoe pattern sets by standardization while retaining the required number of designs?
8. Do you ensure that each operation can be performed readily without any undue manipulation of the components?
9. Do you eliminate any operations that are unnecessary and which do not enhance the quality of the product?
10. Do you test a number of sizes on each design prior to bulk production?
11. Do you fit test each design prior to bulk production?
12. Can the specified quality standards be achieved at each operation?

Production Planning and Control System

1. Do you operate a production planning and control system?
2. Do you operate an efficient system?
3. Does the system produce an efficient customer service?
4. If it does not, what are the reasons?
5. Do you stock an adequate but not excessive supply of materials?
6. Do you have an adequate supply of machinery?
7. Do you have a trained labour force capable of producing the required output without overtime?
8. Do you quote realistic delivery dates to your customers?
9. Do you develop the product in time to ensure that it can be manufactured and delivered on the specified date to the customer?
10. Is the work content of each design available to the planner during the planning process. Unless this information is available, the planner may be introducing "bottlenecks" into the system?
11. Do you produce the production plans on a daily or weekly basis?
12. Do you check to ensure that all of the materials are available?
13. Are the plans discussed with the staff prior to the implementation of the input?
14. Do you record in detail the output of the products from each department. Do they receive a copy of the output?
15. Is there a system in place to ensure that you are constantly aware of the arrears situation?
16. What action do you take when arrear occur?
17. Are steps taken to eliminate the problems for future inputs?

Material Purchasing and Control System

1. Do you maintain a stock control system, to ensure that materials are available when required, in the appropriate quantity and quality to suit the company's plans?
2. Do you calculate the amount of materials required for each input?
3. Since the cost of materials is quite high, do you maintain a maximum and minimum stock control system?

4. Are accurate stock records maintained, and orders placed when required?
5. Are incoming and outgoing materials recorded on the stock cards at the point of entry and departure from the material store?
6. Since the costs of storing materials are quite high, are the following points taken into account when purchasing materials?
    a. The availability of materials at a local level.
    b. The delivery time required to obtain the materials
    c. The costs involved in holding stock.
    d. The costs involved in production losses if materials rae not available?
    e. Large stocks are required when materials are purchased from overseas.
    f. Failure to satisfy customer demands and the consequences.
7. Is the storage space sufficient to stock all of the material requirements?
8. Are all of the materials examined at point of entry?
9. Are upper materials examined for grade and quality?
10. Is the amount of material issued to each cutter recorded?
11. Is the amount of material returned by each cutter recorded?
12. Is this information available on a weekly basis, showing the performance of each cutter?
13. Are stocktaking exercises carried out on a regular basis?

Quality Control

1. Does your company operate a quality control system?
2. What type of structure do you use?
3. Are you satisfied with the system of development in your company for new products and designs?
4. What type of development system do you use?
5. Do you develop the sample size in the initial stage?
6. Do you ensure that the materials and components are as specified?
7. Are all of the operations checked to ensure that there are no problems that can affect quality or quantity?
8. Do you check all of the material allowances to ensure that they are as specified?
9. Do you check the materials to ensure that the quality is as specified?
10. Do you examine the product to ascertain whether any financial savings can be made?
11. Do you develop extra sizes?
12. Are the sizes checked to ensure that the grading operation has not affected the fit of the upper on the last?
13. Are all of the operations checked to ensure that no changes have occurred during the grading or processing of the extra sizes?
14. Is the design finally checked to ensure that it is profitable to manufacture?

15. If knives are purchased, are they checked to ensure that the shapes are as specified?
16. Is the first bulk order examined at various stages of manufacture to ensure that all of the pattern shapes and quality are as specified?
17. Is the machinery maintained in the proper condition to ensure that the operations can be performed efficiently?
18. Have the operatives been trained sufficiently to ensure that the specified quality standards can be obtained?
19. Are the specified quality standards for each operation available at each machine or bench?
20. Is the product examined at the end of each department?
21. Is the prorduct finally examined at the end of the manufacturing unit?
22. Are the products constantly examined by Supervision and Management?
23. Are box work examinations periodically carried out to examine the quality of the product as seen by the customer?

The Manufacturing Unit

Layout

1. Is there an efficient layout?
2. Are the departments planned in sequence, with eacy access to each area?
3. Are there ample lighting facilities at each operation to enable each operative to perform efficiently?
4. Is the distance between operations excessive?
5. Is there insufficient space between each operation?
6. Are there an excessive number of operatives employed at each bench?
7. Are the benches and chairs of the correct height and shape to enable the operatives to work comfortably and to encourage increased productivity?
8. Are the ventilation conditions satisfactory?

Productivity

9. Are the operatives operating at a 133 performance rate?
10. If not, what are the problems which prevent them from doing so?
11. Is the supply of work constant, at the required rate?
12. If not, what are the reasons which prevent this process from occurring. Is it necessary to introduce a method study appraoch?
13. Are sales sufficient to supply the workforce with the required amount of work?
14. Is it possible to increase sales?
15. Are any of the operativesw surplus to requirements?
16. Is there an intermittent supply of work?
17. Is this due to lack of operative training. Is it necessry to intorudce a training programme?
18. Is it due to an excessive number of constructions and designs?

19. Is it due to faulty machinery or lack of spare parts?
20. Is it due to low grade materials?
21. Is it due to poor fitting patterns?
22. Is it due to absenteeism? Is the labour force trained to perform a number of operations?
23. Is there a constant supply of materials? If not what are the problems?

Leather and Component Stores

24. Are all of the materials neatly packed in containers or shelves?
25. Are the materials checked for quality and amount upon arrival at the stores?
26. Are they recorded on teh stock cards, and details delivered to the account department?
27. Is the upper material separated into the different quality grades?
28. Is the cutting coefficient system used?
29. Is the area of each skin assessed prior to delivery to the cutters?
30. Are the material returns from the cutters recorded?
31. Are details of each day's output delivered to the accounts department?
32. Is supervision informed if material losses occur due to cutting?
33. Are there problems in relation to supplies?

Cutting Section

34. Is the layout efficient?
35. Are handcutting and press cutting methods in use?
36. Are the machines in good condition?
37. Are there efficient facilities for storing the materials at each bench or machine?
38. Are the cutting boards level in good condition?
39. Are there facilities available for the planning of boards?
40. Is each batch of work accompanied by a ticket with details of the maount of material in each quality grade?
41. Are the cutters cutting the material in an economic manner?
42. Are they operating to a set plan when cutting the material?
43. Are they quality conscious?
44. What productivity rate do they operate it?
45. Is there a sufficient supply of work?

Closing Department

46. Is the layout efficient and are machines positioned in the correct sequence?
47. Are the machines in good condition?
48. Is there a sufficient supply of work for each operative?
49. What productivity rate do they operate at?

50. Is it necessary to improve on any of the methods in use?
51. Is there an efficient training programme?
52. Are the patterns fitting accurately?
53. Are the operatives performing to the required quality standard?

Lasting and Making Department

54. Is the layout efficient and are machines positioned in the correct sequence?
55. Are the machines in good condition?
56. Is there a sufficient supply of work for each operative?
57. Is it necessary to improve on any of the methods in use?
58. Are the patterns fitting accurately?
59. What productivity rate do they operate at?
60. Are the operatives performing to the required quality standard?
61. Is there an efficient training programme?

Supervision

62. Are they operating to efficient management standards?
63. Do they anticipate problems that may arise?
64. Do they deal efficiently with each problem?
65. Are they quality conscious?
66. Are they managing or operating?
67. Do they plan in advance?
68. Are they good at organizing?
69. Do they achieve the production targets?
70. Are they good with people?
71. Are they cost consious?
72. Do they need extra training?

Layout and Transport System

1. It is necessary to position the machinery to allow for a smooth flow of products, at a low cost and with the minimum of handling.
2. do you use the "layout by process" in which all of the smae operations are grouped together. The "cutting" is located in one area, and the "closing" in antoher followed by the "lasting process". This layout is usually chosen when a large number of products with a low volume of output are manufactured on the same machinery.
3. Do you use the "product line layout"? All of the machinery needed to manufacture the product is located in the same area. This layout is mainly used when there is a demand for one or serveral products that are standardized.
4. Do you operate the "group production process". The group operate on a product or part of a product. The machinery and equipment needed is available. Generally a group of workers distribute the work among

themselves and interchange jobs. This process is gaining in importance, because it reduces considerably the amount of time required to manufacture shoes from cutting to boxing.

5. Do you operate a "rink system". Those systems have been in use for some time now. There are two main types used in the Closing Department. (Team and Toyotal types). There are many advantages to such systems, including a reduction in work in progress and improved quality standards. In the Lasting Department the shoes on a Rink system can be processed direct from insole attaching to boxing. Normally, it is more practical to handle one pair at a time, either by a handling device, or from person to person.

6. In the Closing Department, perhaps one of the more popular types is the "Feeder/Operative/Feeder" belt system. One person is employed as a feeder, who ensures that all of the operatives employed on the conveyor, are constantly supplied with work. There are a number of advantages associated with this system. The amount of work in progress has been reduced dramatically. The number of boxes of work available has been limited.

7. What type of conveyor system do you use in the Lasting/Making Departments. There are a number of conveyor systems that can be used. The "old rack system" had many disadvantages, such as a large amount of work in progress, lack of control in the distribution of the work, and long processing period.

   The "Push track" is generally constructed from angle iron, and nylon wheels are attached. Trays normally contain three or four pairs of shoes. Upon completion of an operation, the operative can readily push the trays along the conveyor to the next operation. compared with the rack system, the conveyor system has reduced the work in progress, and the time required to manufacture the shoes.

   "Paced belt" conveyors are also used in the lasting and making departments, and high productivity outputs can be obtained. Another conveyor system can be described as teh "intermittent drive" type with three or four sets of rails and three pair trays. The trays stop at each station for a specific period and automatically move on to the next operation.

Shoe Costs/Overheads

The Prime Costs

1. Do you measure all of the upper components during the costing process. It is necessary to do so to obtain an accurate costing. Upper components include vamps, quarters, h/straps, leather trims, linings, plumpers, backers ans stocks, etc.

2. In the bottom section, it is also necessary to measure insole and sole materials. This section also includes stiffeners, heels, top>pieces, shanks and seat socks. Generally it is not necessary to measure those items, as they are normally purchased from manufacturers who specialize in those areas, and the cost of each item is already available.

3. In the grindery area do you have difficulties in measuring grindery items such as adhesives, threads, dressings, tacks, tissue paper, tapes, etc.

   There are different methods in use to cost such items. It is possible to produce an average cost for each item. This is obtained through dividing the total cost of each item used over a three or six month period, by the

number of shoes manufactured during that period. The costs can also be obtained for some items in a shorter period by the use of a different method. For example, a can of adhesive is weighed prior to usage. The adhesive is then applied to 100 pairs. The can of adhesive is reweighed. The difference is expressed as a % of the original weight. This can then beexpressed as a % of the cost of the can of adhesive.

In the grindery section, toe puffs, boxes and labels are also included. However there are no difficulties involved as the cost of each item is available.

4. Do the labour costs present any problems?

   There are a number of cost methods that can be used. If there is an incentive payment system in use, then obviously there is a financial value for each operation. Consequently the labour cost for each design can be obtrained readily. If a day rate payment system exists, it is necessary to divide the wages paid to the operatives, by the number of pairs manufactured in the same period, to obtain the average cost per pair.

5. How are the prime costs obtained?

   They are obtained by adding together the Upper, Bottom, Grindery, and Labour costs.

6. The overhead costs and profit margin are added to produce the final cost.