



**PRODUCTIVITY IMPROVEMENT OF
ETHIOPIAN SHOE MANUFACTURING
INDUSTRIES
(A Case Study in OK Jamaica Shoe Factory)**

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ABSTRACT

The objective of this thesis is to improve the productivity of Ethiopian foot wear industries by giving specific emphasis to OK Jamaica shoe factory. The study focuses on proper human resource management and material resource management. Method study is also used to achieve at a good productivity of the factory. Detail and different types of data were collected through review of the available documents, physical observation and discussion with some concerned people. The data was again purified to increase its reliability and then analyzed to identify the barriers for productivity.

Finally, it is identified that the factory is characterized by low productivity due to traditional way of doing jobs, inadequate human resource management, and improper material resource management. Also congestion of employees as well as raw material & finished goods ware house is observed as one of the basic problems.

The identified problems were further studied and different techniques were used to come up to out put of the thesis.

CHAPTER ONE

INTRODUCTION

Productivity is the efficiency of a production system expressed by a ratio between output and input. It is the measure of how much input is required to produce a given output. Inputs may be labor, materials, capital or energy while the different products or services provided by the organization to its customers are outputs of a production system. Materials and human resources are the main inputs of a production system whose efficient management plays a great role in productivity improvement.

Productivity improvements can be realized by achieving more output for the same input or achieving the same output from less input or achieving much more output for slightly more input and or getting slightly less output for much less input . [8]

Productivity Improvement in Ethiopian shoe industries, as elsewhere, is a major area of economic activity that concerns, cost savings, measurable quality gains, improved consistency & rapid payback.

The footwear industry in Ethiopia is thriving, and in the early 2000s, it managed to recover the domestic market which had been swept by legally or illegally imported Chinese shoes in the late 1990s. More than 20 shoe factories have so far been shut down, the sector's productivity has decreased by 50% as well as more than 15,000 workers have been laid off [31]. Since then, the industry has been growing not only because of a number of new entrants but also because existing enterprises have been expanding by improving product quality and developing new marketing systems. Hence in order to be more competitive in the local as well as international market productivity improvement is one way.

It is high time for the application of productivity improvement technique in Ethiopian shoes manufacturing industries and it is done giving more emphasis to

OK Jamaica Shoe factory to solve the problems associated with material and human resources.

Different techniques of human resources management and material resources management system along with method study procedures are used for analysis to improve the productivity of the factory, which would lead to the effective and efficient utilization of these resources so that the industry can improve its productivity by minimizing its production cost.

1.1. Background

1.1.1 Background of Selected Ethiopian shoe Manufacturers

The production of leather shoes in Ethiopia dates from the late 1930s when Armenian merchants founded two shoe factories in Addis Ababa. These factories nurtured a number of shoe makers, who opened their own factories and trained their workers. Today there are about 9 mechanized (large scale) footwear factories and 30-40 medium scale manufacturers. Since the medium scale factories can use the mechanized ones as their bench mark, this paper focuses on the mechanized foot wear factories only.

Anbessa Shoe Share Company

Anbessa Shoe was established in the 1930s. The objective of the factory is to produce all kinds of leather shoes for the local as well as export markets. In addition, the branch manufactures 'lasts' (moulds or templates used to shape shoe uppers) for the factory's own use. A recent history of Anbessa's production of its principal product lines shows that 51% of its products are targeted at men, 23% at women, and 26% are for children. The entire output from the factory is sold in the local market and is targeted at the middle and lower income groups. The age of the factory's plant and equipment is between ten and twenty-five years.

Tikur Abay Shoe Factory

Tikur Abay Shoe Factory formerly known as Asko shoe factory is located ten kilometers from Addis Ababa and was established in 1948. The objective of the factory is to produce leather shoes for local and export markets. Its market share is estimated at 85% for military shoes, 60% for working boots and 10% for civilian shoes. In addition the factory produces glue for own-use and for sale. The factory's main raw materials are processed leather, which is sourced locally, and chemicals, most of which are imported from Europe (Germany, Sweden and Italy) and from Sri Lanka. The age of the factory's plant and equipment is between 20 and 25 years.

Peacock Shoes Factory

Peacock Shoe Factory is located at Bole Ring road in Addis Ababa and it is under Dire Industry Plc. Originally the factory was located in Piazza with a total capacity of 200 shoes per day. Currently the factory is working in partner ship with Adelphi which is one of the top ten shoes manufacturing companies in Italy. The factory has a total capacity of 3,000 shoes per day and it manufactures 2,500 export shoes per day with 500 permanent employees at the production department.

1.1.2 Back ground of OK Jamaica Shoe Factory

OK Jamaica shoes factory is a privately owned company established in 1969 and involved in producing men's, Ladies, Children and soccer shoes. The factory is set up with a capital outlay of 650,000USD, and it is located in Arada Kifle Ketema, Addis Ababa. The factory operates eight hours a day in one shift.

OK Jamaica shoes factory has employed 46 permanent employees. With the existing situation, it has a manufacturing capacity of 240 shoes per day.

Besides the current operational factory, a new plant is under contraction which has total capacity of 800 shoes per day.

OK Jamaica shoes factory mainly follows four processes to manufacture different types of shoes. These are Clicking, closing, lasting & finishing operations.



Picture 1.1 Owner of Jamaica shoe factory with Dr. Daniel Kitaw

1.2 Statement of the problem

The majority of Ethiopian population, around 85 %, lives in rural area where agriculture is the only means of incurring an income for existence. In order to improve the living standard of our people, the development of different kinds of industries is essential. Among the different kinds of industries, foot wear industries result in poverty reduction since it is one of the most labor-intensive industries providing ample employment opportunities.

Ethiopia, with its rich possession of fairly sizable population of live stock in the form of cattle, sheep and goat ranks among the top ten countries in the world. The hide and skin derived out of this live stock forms the raw material base for leather and associated industries. However the country is not utilizing this raw material resource satisfactorily.

About 80% of the world's leather product is utilized by the foot wear industries. Ethiopian footwear manufacturers are also using remarkable leather for their product. [2]

An effective system of management of the resources of an industry is essential to produce quality products in a productive way and to be competent in the local as well as global market. The productivity of most foot wear factories is declining as result of poor human and material resources management.

The productivity of workers is at a very low stage that large amount of man-hour and work forces are utilized to produce the same or decreased amount of output. The factory does not have an adequate human resources management system that enables continuous job analysis with the changing technology and the method of doing work. Most of the workers lack motivation, adequate skill and educational background, which had to be maintained through training and education to improve the products and production processes the company in a continuous manner.

Low productivity of materials is a result of high production cost of the small volume of production that is contributed by inefficient purchasing, inventory management and material handling of the large amount of input entering to the process. The raw material for foot wear industries is largely leather, which is expensive. By proper management of materials, foot wear factories can benefit a lot and be competent in the local as well as international markets.

Ok Jamaica shoes factory faces problems that are associated with inefficient human resource management & material resource management.

1.3 Objectives of the Study

The general objective

The general objective of the thesis is to develop different methods for improving productivity of Ethiopian shoe industries so that the sector can be competitive in the international market. This is to be done with specific emphasis to Jamaica Shoe Factory.

The specific objectives of the thesis are:

- Improve material management of:
 - Raw materials
 - In-process goods
 - Finished products
- Improve human resource management through:
 - Efficient man power planning technique
 - Efficient employment procedure
 - Need assessment of training and education for different sections
- Improve the workers way of doing jobs
- Reduce wastage

The purpose of this research is to explore a solution to problems related to productivity improvement in Ethiopian shoe industries with specific emphasis to Jamaica shoe factory. The proper management of the materials and human resource is one of the critical performance factors to improve the utilization of their unused capacity and improving the workers' method of doing jobs by efficient method study to increase their productivity as well as competitiveness.

CHAPTER TWO

LITERATURE SURVEY

In this chapter the literature survey for the thesis is briefly discussed. It contains productivity, productivity improvement, method study, human resource management, material resource management and shoe manufacturing.

2.1. PRODUCTIVITY

2.1.1 Definition

Productivity is a ratio to measure how well an organization (or individual, industry, country) converts input resources (labor, materials, machines, capital, energy etc.) into goods and services (out put). This is usually expressed in ratios of inputs to outputs. That is (input) cost per (output) good / service.

A simple way of looking at productivity in a business organization is to think of it in terms of the productivity model of figure 2.1. The Productivity Conceptual Model takes the form of a 'productivity tree'. The roots denote the inputs to the system, the trunk the conversion process and the foliage and fruits the systems outputs. [29]

The successful management of this process is ultimately the key to survival of any organization. It should be the concern of and a development goal for all organizational members, irrespective of their position.

The International Labor Organization (I.L.O) publication, "Higher Productivity in Manufacturing Industries" has defined productivity as the ratio between output of wealth and the input of resources used in the process of production. [11]

The Organization for European Economic Co-operation (OEEC), in its widest sense has defined the concept of productivity as: "that productivity is the measurement of the economic soundness of the means". [12]

The organized labor has tried to interpret productivity as the value of all output divided by man-hours of work. This assumption is based on the promise that labor is more productive, where the ratio of the time required to time spent in producing a unit of output is higher than in a situation where this ratio is lower. The successful management of this process is ultimately the key to survival of any organization. It should be the concern of and a development goal for all organizational members, irrespective of their position.

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The European Productivity Agency (EPA) has defined productivity as an attitude of mind. It is a mentality of progress of the constant improvement of that which exists. It is the certainty of being able to do better today than yesterday, and continuously. It is the constant adaptation of economic and social life to changing conditions, it is a continual effort to apply new techniques and methods, it is the faith in human progress.

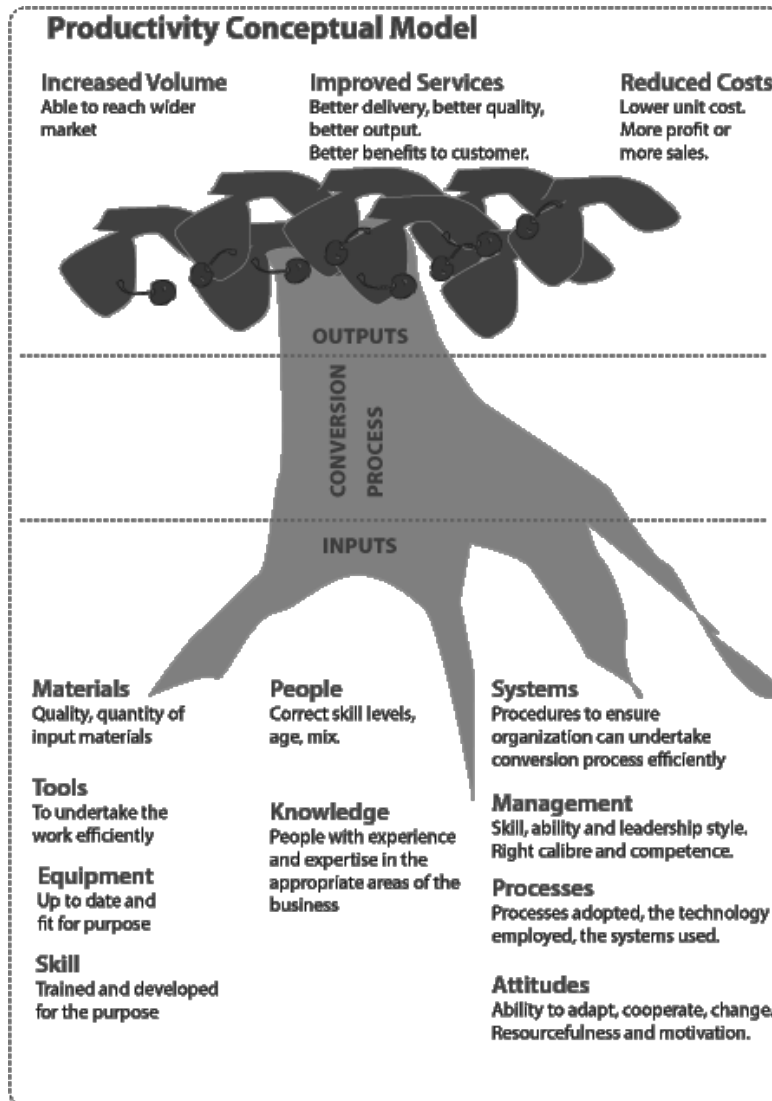


Fig 2.1 Productivity Conceptual Model [29]

Even though productivity in a general connotation is referred as the 'output to input' ratio, in essence it is the process of harnessing the capacity to increase yield by ensuring proper and efficient use of all types of resources in employment using them to produce as many goods and services as possible, of the kind and quality most wanted by the consumers at lower costs. [13]

For the nation: productivity would broadly mean the optimized use of real resources (i.e. the man-power, materials and capital equipment) in order to obtain the output of goods and services needed by the community.

For the manufacturing company: The output of manufactured goods sold (The effective use of available resources, employees of all ranks, materials, and services and Capital Assets).

For the individual: The saleable value of work achieved in return of reward, the use of personal resources and those provided for personal use.

One could debate endlessly the many interpretations of these words but the broad concept is the same, i.e. Value of Output / Value of Input at any scale. Where the output could be product or service and the input could be labor, machine, material, finance, etc.

It will be noted, however, that while the national concept controls the material standard of living of the people, who enjoy it as people nation; the company concept will vitally affect the balance-sheet, and the individual concept will broadly affect the reward justified for personal contribution made.

2.1.2 Measurement

Productivity is measured in terms of certain data. When the word productivity is used without any qualification, it is assumed it is productivity of labor. The following four formulae are suggested for measurement of productivity. [8]

- Physical output per man-hour
- Physical output per tone of raw materials consumed, to reveal waste and scrap reduction.
- Physical output as a percentage of the rated capacity of plant or the ratio of productive machine hours used to total productive machine hours available.
- Physical output per dollar of working capital employed.

Where the ultimate product is identical and uniform throughout, the mere addition of all the numbers produced during a given period of time, say, one year, will give us the total number of units produced. This figure when divided by the corresponding total number of man hours will give us the physical output per man-hour.

Similarly a ratio like physical output per tone of raw material or material consumed or as a percentage of rated capacity of the plant and also in terms of every money value of the working capital used, can be worked out.

In those plants where the final products are varied and not uniform, the physical output can be converted into standard hours, and the sum total of all the standard hours discharged in the production of the different articles will give us the total standard hours which, if related to the total production cost during the corresponding period, would give us the cost per standard hour. Alternatively, these standard hours when divided by the actual man hours will make available to us another equally good gauge for measuring productivity.

(i) Similarly the productivity is measured for machines by the formula:

$$\frac{\text{Productive machine hours used}}{\text{Total Productive machine hours available}} \times 100$$

(ii) Productivity of men is measured by:

$$\frac{\text{Productive man-hours used}}{\text{Total productive man-hours available}} \times 100$$

(iii) Similarly the productivity of capital is measured by:

$$\frac{\text{Output in \$}}{\text{Working capital employed}} \times 100$$

2.2 PRODUCTIVITY IMPROVEMENT

Productivity improvement is not just doing things better: it is doing the right things better. There are two major categories of productivity improvement factors, External (not controllable) and internal (controllable). [17]

2.2.1 Productivity Factors and Their Classifications

A factor is any force or impact that changes the productivity level and its rate of growth. Therefore, to improve productivity one has to be aware of all the critical factors (forces and impacts) in order to influence them by adopting different sets of actions.

In order to make good management decisions concerning productivity improvement, it is important to classify all the productivity factors into general groups and subgroups which help to allocate proper weight and priorities and put them in the care of the right persons and organizational units.

Productivity factors are classified in a number of ways. Some classifications are: external- internal factors; process related factors; resource related factors; and positive-negative (barriers) factors. Details of each classification are discussed below. [15]

External - internal factors

External and internal factors classification is the most general, and helps to group factors into those that enterprise management cannot control or influence in the short run (external factors) and those that are under enterprise management and control and should be influenced by it (internal factors).

Process related factors

Since the main consequential elements of any production process are input, process, output and feedback, it is often useful to classify the productivity and

quality factors into these four groups: input (resource-related); process (transformation of resources into production); output (products and services sold); and feedback (measurement of results).

Resource – related factors

Many specialists in the analysis of productivity factors link them only with resource-related factors such as manpower and capital. The manpower factor includes work attitudes, skills, work organization, motivation etc. If a capital factor is considered, land, plant, equipment, and facilities are usually mentioned.

Positive-negative (barriers) factors

Other possible classification of productivity factors is the positive-negative (barriers) factors classification. Such groupings can be useful, as some management approaches favor the promotion and strengthening of the impact of positive factors (such as interest, enthusiasm, availability of technology, etc.) and the elimination or reduction of the impact of the productivity barriers (for example, resistance to change, safety hazards, low morale, shortage of skilled manpower, etc.).

Technically, it is often better to begin improving productivity with the elimination of well known and evident barriers and bottlenecks before initialing the development of positive factors such as new technology, training, improving motivation, etc. which require a certain investment. This often starts with a group of people brainstorming and developing a checklist of the most important productivity barriers or problems.

2.2.2 External Productivity Factor

In addition to the internal productivity factors, productivity also depends upon external economic, social, political and other infrastructures conditions, which influence the effectiveness and decision-making process of enterprise management. [13]

Such environmental factors as business cycles, economies of scale, political and social conditions, climate and environmental legislation also have an impact on the production process through different kinds of direct and indirect linkages. Thus, external factors include government policies and institution mechanisms; political, social and economic conditions; the business climate; the availability of finance, power, water, transport, communications and various social movements and networks. They affect productivity and decision-making in individual enterprise; but the organizations concerned cannot actively control them.

2.2.3 Internal Productivity Factors

A good example of management's role in controlling and managing internal productivity factors could be to break down the work content by the time spent on productive and non-productive activities.

The work content is the amount of work contained in a given product or process measured in work-hours.

The basic work content is the time taken to manufacture the product or to perform the operation if the design or specification of the product is perfect, if the process or method of operation is perfectly carried out, and if there is no loss of work time for any reason whatsoever during the period of operation. Thus the basic work content is the irreducible theoretical minimum time required to produce one unit of output.

The excess work content (total ineffective time) is caused by poor product design or utilization of materials, inefficient methods of manufacture or operation, and ineffective time resulting from an unsatisfactory human resources situation.

We shall now follow the internal productivity factors through the production process. Each of these elements has a specific objective and logic. The first organizational element (input factors) is responsible for the provision of all

necessary resources of the proper quantity, quality and price and at the right time and place.

The second element is the actual production process – the process of transforming resources (input factors) into products, i.e. output. Feedback could also be considered as an important part of the production process, since it deals with the measurement, assessment and analysis of the most important production stages and results with productivity (effectiveness).

The third and last element (output factors) deals with the product mix: packaging, pricing, sales, delivery and after-sales services, and etc. The optimal combination of these three groups of factors is critical in achieving overall productivity improvement for the whole enterprise.

Input related factors

The most important input productivity factors may be grouped as; capital, plant and machinery; technology and know-how; materials and energy; product design; and people.

Process related factors

Effective process organization and management is the next important condition of productivity growth in any manufacturing or Service giving Company. This is the stage, where available resources (input) are transformed into final products or services to be sold (output).

- People

In the process stage, the human factor of productivity improvement always refers to the development and effective use of human resources. For example, workers in an enterprise can influence the time of operations voluntarily or involuntarily as shown;

- Absenteeism and lateness. If management fails to provide a safe and satisfying work climate, workers may respond with absenteeism, lateness and deliberately “going slow”.
- Accidents and occupational hazards. If management fails to provide a safe and healthy place to work, accidents or occupational illnesses can occur, with adverse effects on morale and increased absenteeism.

If these factors can be eliminated, the minimum time and cost for the production of a given output, and hence the maximum productivity, are achieved. The man factor, in turn, can have many dimensions or sub-factors, such as; the quantity and composition (age and sex) of the work force; the skills level and structure; educational and cultural background; attitudes and values; and interests incentives and motivation.

- Materials and energy

One very important factor of productivity is materials and energy. Waste of material often comprises about 40 percent of total national production cost on average; if we take energy into account as well as raw material, this figure increases great deal. It is often considered biggest cost element. Poor operator practice, poor layout and inadequate storage space can aggravate the problems of handling materials and lead to excessive movement.

Even small efforts to reduce the consumption of materials and energy can bring remarkable results. These vital sources of productivity include both raw and indirect materials (process chemical, lubricates, fuel, spare parts, engineering materials, packing materials).

Improving the productivity of materials and energy at the process stage is a system against waste. Materials and energy are wasted in so many ways that we begin to accept these wastes as a normal part of doing business. Materials are wasted owing to wrong specifications, inadequate quality assurance efforts in the

early stages of production cycle, inadequate procedures in storage and handling, wrong production methods, defective machines or outright pilferage.

This wastage is caused by employee and managers. They are the ultimate determinants of the level of waste in an enterprise. Work habits and attitudes, production or office procedures, labor management relations, communications and other factors that affect the human element – all these determine whether there will be a wasteful or a cost – effective operation. Several of the following ways may be suggested at this stage to plan and implement the productive use of materials and energy.

Ensure that : the process to be used is the best possible one; operators and properly trained and motivated; proper handling and storing system at all stages from raw materials to finished

Feedback

In general, feedback is information on the interrelationships between input and output in an enterprise, and between the enterprise and the national (or international) environment. In other words it shows how a society evaluates the quantity and quality of the product; how much it is ready to pay for it; and, from the other side, how much it wants to be paid for the main input (labor and capital) which a society supplies to an enterprise.

From this point of view feedback could be considered as productivity measurement. At the enterprise level we need to measure inter-relationships between the costs of input and output. A result of this measurement shows the effectiveness of the method/process in relation to the internal environment of the enterprise. This measurement takes into account business conditions, prices, some political circumstances, the degree of government intervention in the economy product specialization, etc.

Output related factors

By output factor productivity we mean the extent to which the product meets output requirements. Use value is the amount that the customer is prepared to pay for a product quality. Use value can be improved by better design and specifications.

Product place value, time value and price value refer to the availability or the product at the right place, at the right time and at a reasonable price. The volume factor in particular gives us a better notion of the economics of scale through increased volume of production. Finally, increasing the benefit for the same cost or reducing the cost for the same benefit can enhance the cost-benefit factor.

2.3 METHOD STUDY

2.3.1. Definition and objective

Method study is defined as “A procedure for examining the various activities of problem which ensures a systematic, objective, and critical evaluation of the existing facts and in addition, an imaginative approach when developing improvements. [28]

In other words method study is a systematic and scientific evaluation of existing and proposed plans and performance of any work system and the evaluation of improvement, through analytical process of critical examination.

There are three different levels and aspects of its application:

- (a) **Method Study.** Method study is the broad investigation and improvement of a total department or section, the layout of machines and equipment, the flow of materials, the movement of men.
- (b) **Motion Study.** Motion study is a more detailed investigation of the individual operator, the layout of his bench or machines, his tools, jigs and

fixtures, the movements of his body as he performs work. The study of his environment, body postures the temperature and noise level of his surroundings which is called '**ergonomics**'.

c) **Micro motion** Study is a very much more detailed investigation of very rapid movements of hands and arms. It requires the use of cine camera and the analysis of filmed records of hand movements.

Objectives of Method Study:

- Better design of plant equipment and buildings.
- Improved layout of factory and offices.
- Better working conditions and environment.
- Greater job satisfaction.
- Higher earnings.
- Improved utilization sources and administration.
- Effective material handling.
- Efficient process and procedures.
- Optimum inventory and output.
- Waste reduction.

Scope of Method Study:

It can be applied to layout, working conditions, movement, quality standards, design, tools and equipments, materials, material handling etc.

Possible improvements may be:

Short term: Improvements which can be introduced quickly and economically, Improvements existing resources, Improvements for which managements and work people are ready.

Long term: Improvements which require investment, Improvements which are not acceptable at present.

2.3.2. Method study Procedures

Method study involves six steps to develop an improved method of doing work that can improve the productivity of workers significantly. [10]

1. Select/Identify the work to be studied

While selecting the work for method study investigation, the following factors must be considered.

- a) Economic - Key profit generating or costly operations, or ones with the largest scrap/waste rates:
- b) Technical - bottlenecks which are holding up other production operations and operations involving repetitive work using a great deal of labor and liable to run for a long time ; and
- c) Human considerations - movement of material over long distances between workstations and high fatigue in the work

After defining the nature of work to be selected for study, and identifying its scope will predetermine the technique to be employed.

2. Recording

The most commonly used recording techniques are charts and diagrams. The selected work to be studied will be recorded by process charts and diagrams using the event symbols of operation, inspection, transport, permanent storage and delay (temporary storage).

3. Examine

The existing method of doing work is examined through a questioning technique with respect to purpose, place, sequence, person and means.

4. Develop

The improved method will be developed after critically examining the current method. Asking the right question is a half way towards finding the right answer,

thus the questions of what should be done?, where should it be done?, when should it be done?, who should do it? And how should it be done? are asked for the development of the improved method. The new method will be recorded in the same way as the existing one for comparison and the proposed method that can improve the productivity will go for installation.

5. Install


The worker who has a direct exposure to the work will test the new method for acceptance. Once the idea is accepted, the worker will be trained to develop a good working habit until the productivity expected is achieved.

6. Maintain


The method will be written so that the immediate supervisor will be able to control for its proper execution. If variations in the procedures arise, he/she will correct or report it to the analyst.

2.3.3 Method Study Activities and Symbols

In order to make a vivid presentation of the facts, and to enable the mind to grasp them quickly and clearly, we find it useful to use symbols instead of words for the activities. The symbols recommended by the American Society of Mechanical Engineers, now used internationally, along with the respective activities are described below:

(i) **Operation.** An operation is an action deliberately performed with the intention of advancing a stage towards a desired result. The symbol that stands for operation is: 

Examples. Starting a motor, A box being railed, A letter being typed, A petrol tank being filled, reading an instruction etc.

(ii) **Inspection.** An inspection is a check that a planned activity has been correctly performed (the product remains unaltered by the inspection) and is represented as: 


Examples. Gauging a component, Trial run of a machine after repair. A steam

pressure gauge being read etc.


(iii) **Storage.** Storage occurs when the product is deliberately removed for a time from

production is represented by: 

Examples. Raw material lying in stores. Finished goods on shelves in a warehouse, Bunkers full of fuel, A letter placed in a file.

(iv) **Delay.** A delay occurs when some undesirable event of circumstance prevent the performance of the next planned activity. Its respective symbol is: 

Example. Waiting for a machine to be repaired, a traffic jam, a power failure, waiting for material, standing in a queue.

(v) **Transport.** A transport occurs when there is movement from one place to another, and this activity is represented by: 

Examples. An operator going to stores for material, a truck pushed down a gangway, a hoist going up, a secretary going to a manager's office, water flowing through a pipe.

Which stands for Operation, Inspection, Storage, Delay and Transport Respectively?

2.3.4. Method study and productivity

Up to some twenty to thirty years ago, the techniques for the analysis and evaluation of work done were very limited in scope and application. Since then they have developed rapidly in quality and effectiveness and particularly in the range of work to which they can be applied. Method study is the most important concept in the process of increasing productivity. The growing complexity of new processes and equipment are quite apart from rising prices, means that now-a-days it is frequently necessary to make a considerable capital investment for each new plant employee. In the case of product standardization and simplification, method study can be used to assess the economies of various alternative methods.

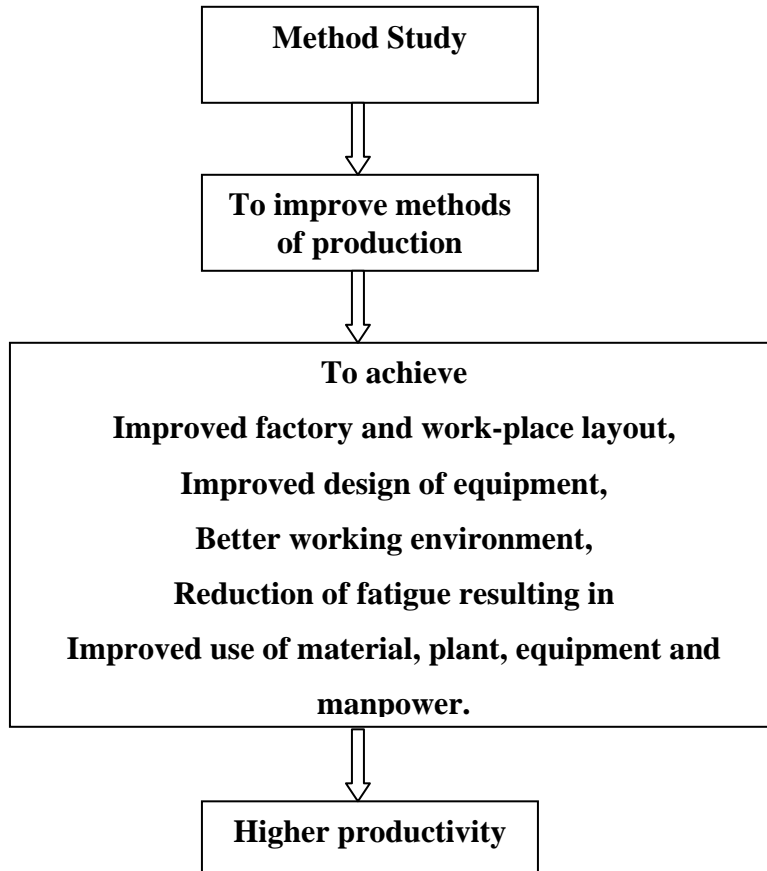


Fig. 2.2 How method study helps in increasing productivity

Productivity is an overall conception which is difficult to express or to measure. It is, however, possible to consider productivity in terms of various basic resources used in industry. Thus it is sometimes expressed in terms of the output from labor, or from services, or from the capital invested. Whilst these partial expressions do not necessarily give an accurate picture of the overall position, they may be very useful.

In the long term it is only through advance in productivity that employees can hope to obtain an increase in real wages, shareholders, an increase in the purchasing power of their dividends, and customers lower real prices. It is equally true that the future economic strength of the nation in a competitive world depends on management's success in achieving this aim, wherever the

provision of goods or services is involved. With the increase in scientific knowledge and the development of better management techniques this advance should not only be continuous, but should take place at an ever-increasing pace. Here it is as well to remind ourselves of a well-known definition of management: the organization and control of human activity directed to specific ends.

2.4 Human Resource Management

Definition

Human resources are defined as the available talents and energies of people who are available in an organization as potential contributors to the creation and realization of the organization's mission, vision, strategy, and goals. [5]

There are two types of workforce in any manufacturing or process industry. Those that are directly related with the manufacturing processes are direct labor force and those that are related with the different types of services of the organization are indirect labor force.

Human resources management is the planning, organizing, directing and controlling of the procurement, development, compensation, integration and maintenance of personnel of an organization for contributing towards the accomplishment of the organizational, individual and social goals. [27]

It is thus a managerial activity involving advisory, executive and administrative responsibilities and functions given below:

1. Development of a personnel policy: The personnel policies serve as a guide to the executives, managers to discharge the duties and responsibilities related to personnel administration.

2. Manpower planning: Ascertaining the requirements of human resources in the light of organization goals and objectives.
3. Recruitment and selection of manpower: Attracting, selecting and employing suitable individuals.
4. Analysis, description and valuation of the work
5. Compensation and schemes of appraisal of the work and informing the employees about their accomplishment and failures to facilitate their development
6. Keeping records of personnel
7. Welfare and safety programs
8. Training and development of manpower
9. Wages and salary administration and etc.

Even though the above listed are the functions of human resources management, the ones which would significantly improve productivity will be covered in the next sections of the study.

2.4.1 Job Analysis

Definition

Job analysis is a systematic process of collecting information that is used to make decision about jobs. It provides a deeper understanding of individual jobs and their behavioral requirement creating a firm basis on which to make human resources decisions. [5], [27]

Organizations must arrange their course through an ever-changing environment. Customers needs change, technologies change, the company's strategic plan changes, and human resources change as people come and go. The human resource functions require up to date documentation of the contents of each job. As new jobs are created, job content will be altered whose changes should be reflected in the documentation.

Thus, Job analysis is the building block of everything that the personnel department does. The human resource activities that use job-analysis information are selection, performance appraisal, training and development, job evaluation, career planning, work redesign, and human resource planning. [27]

Why Job Analysis?

The main purpose of job analysis is to determine the need for particular jobs and to forecast future knowledge and skill requirements so that the organization will have the right employees fulfilling the right job requirements all the time.

Job Analysis Methods

Job analysis may be conducted in a number of ways to gather different job information. The most common methods are: interview, questionnaires, observation, and employee recordings. [24]

a. Direct Observation: The analyst watches job incumbent and records activities. Some type of follow-up is required to establish essential job functions and Knowledge, Skill and Abilities (KSA's). This method has the advantage to give a first hand knowledge of job requirement, works with jobs that have a short work-cycle and supports other data collection methods, but its use is limited because many jobs do not have complete and easily observed job cycles and does not provide complete information for more complex jobs. Thus, observation may be more useful in repetitive jobs and/or in conjunction with other methods.

b. Interviews: The analyst interviews the incumbents and records their description of job duties and KSA. This method has the advantage to allow for personal involvement and immediate follow-up to vague information, but has the disadvantage of being determined by the skill of the analyst.

c. Questionnaires: In this method, a survey/questionnaire is distributed to all job incumbents. It has the advantages of quick and easy to administration, can get

larger amounts of information in a short time and allows employee participation. On the other hand, it has a drawback that the Quality of information to be determined by the quality of the questionnaire, the respondent must have high school reading and writing ability to complete one and often needs follow-up interview or observation.

d. Employee Diaries or Log: Employee activities are recorded over a period of time on a log book. It is useful for studying what is and what is not contained in job description and job specification, but this method does not give us the information about the right duty and responsibility as well as the KSA that should be acquired by the employee.

2.4.2 Job Design

Job design defined

Designing a job refers to the process of organizing work into tasks required for a job. The process of linking specific tasks to specific jobs and deciding what techniques, equipment and procedures should be used to perform those tasks. Proper job design is critical for increasing the effectiveness of operations, worker efficiency and satisfaction. [25]

There are three approaches to the design of work: these are; traditional, motivation and motion study/method study approaches. Motion study/method study approach is the main approach contributing to the productivity of human resources of an organization. Hence, the method study approach will be dealt in detail due to its relatively higher significance. [27]

Traditional approach

This relies on what is customary in the determination of the job content. The job is designed as to what the company has got used to.

Motivational Job Design

The motivational approach to job design focuses on the job characteristics that affect the psychological meaning and motivational potential, and it views attitudinal variables as the most important outcomes of job design. Motivation reduces the psychological impact of work on the individual worker to enhance employee productivity and job satisfaction. [28]

The prescriptions of the motivational approach focus on increasing job complexity through job enlargement, job enrichment, and the construction of jobs around socio-technical systems.

The five characteristics of work believed to be important in affecting motivation and performance are:

1. *Skill variety*- the extent to which a job demands different skills of the person
2. *Task identity*- the degree to which the job requires doing a task with a visible outcome from beginning to end
3. *Task significance*- the degree to which the job has a substantial impact on the lives of others in the company
4. *Autonomy*- the degree of freedom, independence, and discretion in scheduling work and determining procedures
5. *Feedback*- the amount of direct, clear information received about job performance

Much of the work on job enlargement, job enrichment, job rotation and self-managing work team has its roots in the motivational approach to job design. These interventions increase employee satisfaction and performance quality, but not necessarily increase quantity of performance as the method study approach to job design.

Job Enlargement (“horizontal” job loading.): Expands number of tasks performed, usually at same level of responsibility and combines a series of tasks into one assignment that is more challenging and motivating. It is also called

Job Enrichment (“vertical” job loading): An approach that seeks to improve task efficiency and satisfaction by building into people's jobs greater scope for personal achievement and recognition, more challenging and responsible work, and more opportunity for individual advancement and growth. It empowers employees to assume more responsibility and accountability

Job Rotation: it systematically moves employees from job to job giving them opportunities to perform a greater variety of tasks. It makes work more interesting by moving employees from one job to another.

2.5 Material Resource Management

Definition

Materials are the physical items that are needed for producing goods and services. Different studies show that materials are one of the main inputs to a process, which would typically account for 40% of the total production cost. [16]

Types of Materials

The various types of materials that are managed by an organization can be grouped as follows:

1. Raw materials: these are processed and value is added to them to provide the required finished item.
2. Work-in-progress: these are part-processed but are not yet in the form required by the customer.
3. Finished products: these are the final products required by the customer.
4. Service materials: they are items used in service and maintenance operations.

Materials management can be defined as the methods and principles, by which we endeavor to plan, organize, coordinate, control and review the flow of materials in an organization. It offers, therefore, a means for the overall control of materials throughout an organization.

2.5.1 Materials Management Activities

The materials management activities can be broken down in to the activities of purchasing, inventory control, and physical movement of raw materials, in-process goods and finished products. [18]

A. Purchasing

Purchasing is the acquisition of goods in exchange for funds. The procurement of materials of the desired quality in time to meet the production specifications at the lowest possible cost is the basic function of purchasing.

The main objectives of purchasing are to:

- Supply an organization with a steady flow of materials to meet its needs ensuring the continuity of supply by maintaining effective relationships with the existing sources and by developing other sources of supply either as alternatives or to meet emerging or planned needs
- Obtain efficiently, by any ethical means, the best value for every unit of expenditure.
- Obtain correct quantities of items to provide uninterrupted production keeping inventory expenses minimum.
- Obtain items at the lowest cost consistent with the quality requirement.
- Maintain sound co-operative relationships with other departments,
- Provide information and advice as necessary so that operations of the organization would be effective.

Purchasing process

A purchase request originates with the ultimate user. The user gets authorization to buy the item from the department head that checks the request against

budgets and agrees with the purchase. The request is then sent to the procurement department.

Procurement department checks the purchase order to make sure that the item is clearly defined, is not readily in stock, the budget is agreed, irreplaceable by an alternative, standard item, and others.

The second step is the analysis of possible sources of supply. The procurement department maintains files on suppliers and can turn to these to compile a list of available suppliers. Those suppliers who are qualified to fill the order are then contacted. If the order is to be determined by bidding, the company will send a request for a price quotation to each supplier. These requests also solicit information concerning discounts, shipping, and delivery dates.

The third step is the analysis of supplier quotations. The bids are reviewed for prices, discounts, shipping and delivery dates. Moreover, the reliability of the supplier, quality of work, and other factors are also considered.

The fourth step is the placing of purchase order. A purchase order is a binding contract, if accepted by the supplier; therefore, the procurement department is careful to see that all of the information on the order is accurate.

The fifth step involves follow up of the order. On important orders, procurement may check occasionally to determine whether satisfactory progress is being made in filling the order. If a lengthy shipment is involved, the procurement department may check to see that the order is being transported on schedule.

The sixth step is the receipt of the items. Here, the item is checked for the right specifications. Finally, the last step involves the completion of records. The items are recorded on inventory, purchase transaction is recorded as complete, and finally payment is sent to the supplier. [19]

B. Inventory Management

Inventory Defined

Inventory is stores of goods and stocks kept to meet future demand. In manufacturing industries, items in inventory are called stock keeping items that held at a stock (storage) point. Usually, the stock keeping items are raw materials, work-in-process, finished products, purchased parts and supplies. [9]

Types of inventories

There are two types of inventories; independent and dependent demand inventories. Independent demand inventories are finished products inventory while dependent demand inventories are inventories of raw materials and in-process goods. The demand for independent items is forecasted, while the demand for dependent items should be calculated from the production requirements for independent demand items. [18]

Decision in Inventory Management

The objective of inventory management system is to make decisions regarding the approved level of inventory and changes in the level of inventory. [9] To maintain the appropriate level of inventory, decision rules are needed to answer two basic questions.

1. When should an order be placed to replenish the inventory?
2. How items should be ordered when inventory is reordered?

Various types of inventory management systems incorporate different decision rules to answer these questions. Some are dependent on time and others on the levels of inventory, but the essential decisions are the same.

All inventory systems can be classified as one of the three varieties based on the above basic concept. The three types of inventory systems are:

- Reorder point system
- Periodic review system
- Material Requirement planning system

The first two operate best for inventory items with fairly constant and independent demand, while the later deals with dependent demand inventory. For the reason that most process industries are facing the management problem of dependent demand inventory, Material Requirement Planning system will be dealt in detail in the following section.

2.5.2 Impact of Materials Management on Productivity

Organizations invest large volume of their capital on materials, which are employed for the production of its products or services. The effective and efficient utilization of resources allow the company to improve its productivity by producing increased amount of output using the same quantity of input or producing the same amount of output with fewer amounts of inputs.

Most management systems in an industry are designed to raise production and increase productivity. One of these systems is materials management that deals with the planning, directing, controlling and coordinating activities that are concerned with materials and inventory requirements. It begins with the determination of materials quality and quantity, and ends with its issuance to production to meet customer's demand as per schedule and at the lowest cost through its different functions.

Purchasing is one of the basic functions of materials management where materials of desired quality and quantity are procured in time meeting the production specifications at the lowest possible cost. It involves selection of the acceptable and reliable suppliers, issuing purchase orders and expediting the delivery of materials to meet the inventory requirements. [19]

Inventory management is another function that involves a systematic procedure for ensuring the availability of items necessary to meet the production requirements at optimum cost. It includes requisition of materials according to the requirement at appropriate time, keeping updated record of materials received,

issued & balance and decision about the optimum size of the order. Inventory management includes the planning and controlling the inventory of an organization. [9], [18]

Planning involves projecting the demand for products and services into long and short-term requirement of materials, adjusting the materials requirements plan with the recent sales information and arranging the facilities, workers, and equipments required for materials management.

Determining the requirements of materials and components to be purchased or manufactured, scheduling of production and purchasing processes of parts and materials, issuing work order to production department and purchase order to suppliers, dispatching the materials to the production departments is performed by the controlling function of inventory management.

Logistics is another function of materials management that deals with the physical movement of raw materials, in-process goods and finished products within the organization.

Different processing industries of Ethiopia face serious problems due to the poor purchasing and inventory management of input materials to production. Large purchasing lead times; longtime holding of inventories; perishable materials lose their important property due to quantity purchase and inventory holding and other production costs. As a result, they employ high amount of input to produce a small level of output.

Because of the large magnitude of expenditures required in acquiring and controlling materials and their influence on profitability, efficient and adequate materials management and control is absolutely essential to increase output employing the same input material or producing the same output with decreased input material i.e. increased productivity.

Thus, materials management has an important impact on the organization's productivity by giving uninterrupted flows of materials, developing reliable suppliers, making purchases at lowest long-term cost, having efficient movement of raw materials, work- in process and finished goods out to customers, minimizing costs of holding stocks and maintaining high quality products by developing good relation with suppliers and customers.

2.6 SHOE MANUFACTURING

Shoes protect feet as well as, when incompatible in size and shape, present exciting factors in inflammatory conditions. Despite the presence of pain, people are reluctant to change their footwear styles. The main function of modern footwear is to provide feet with protection from hard and rough surfaces, as well as climate and environmental exposure. [30]

According to McPhoil (1988) the anatomy of a shoe can be divided in an upper and lower (or bottom part). Sections of the upper include vamp, quarter, toe box, throat, insole board, and top line. The sections of the lower shoe consist of an outsole, shank and heel.

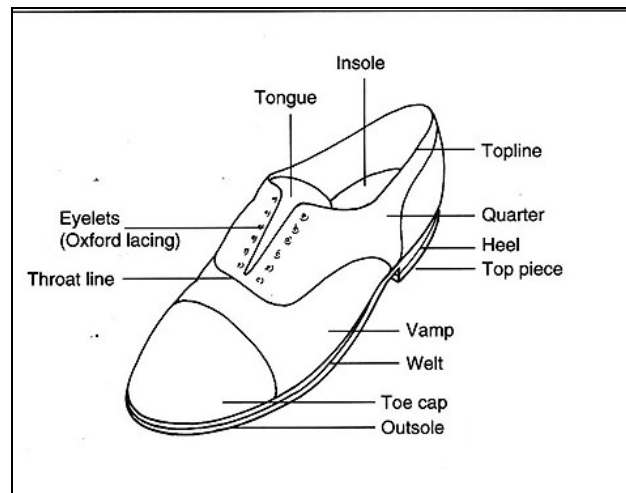


Figure 2.3 Anatomy of shoe

Manufacturing Process

There are four main lines in the manufacturing of shoes, i.e. upper part preparation, insole preparation, outsole preparation and assembling as shown in the flow diagram next page.

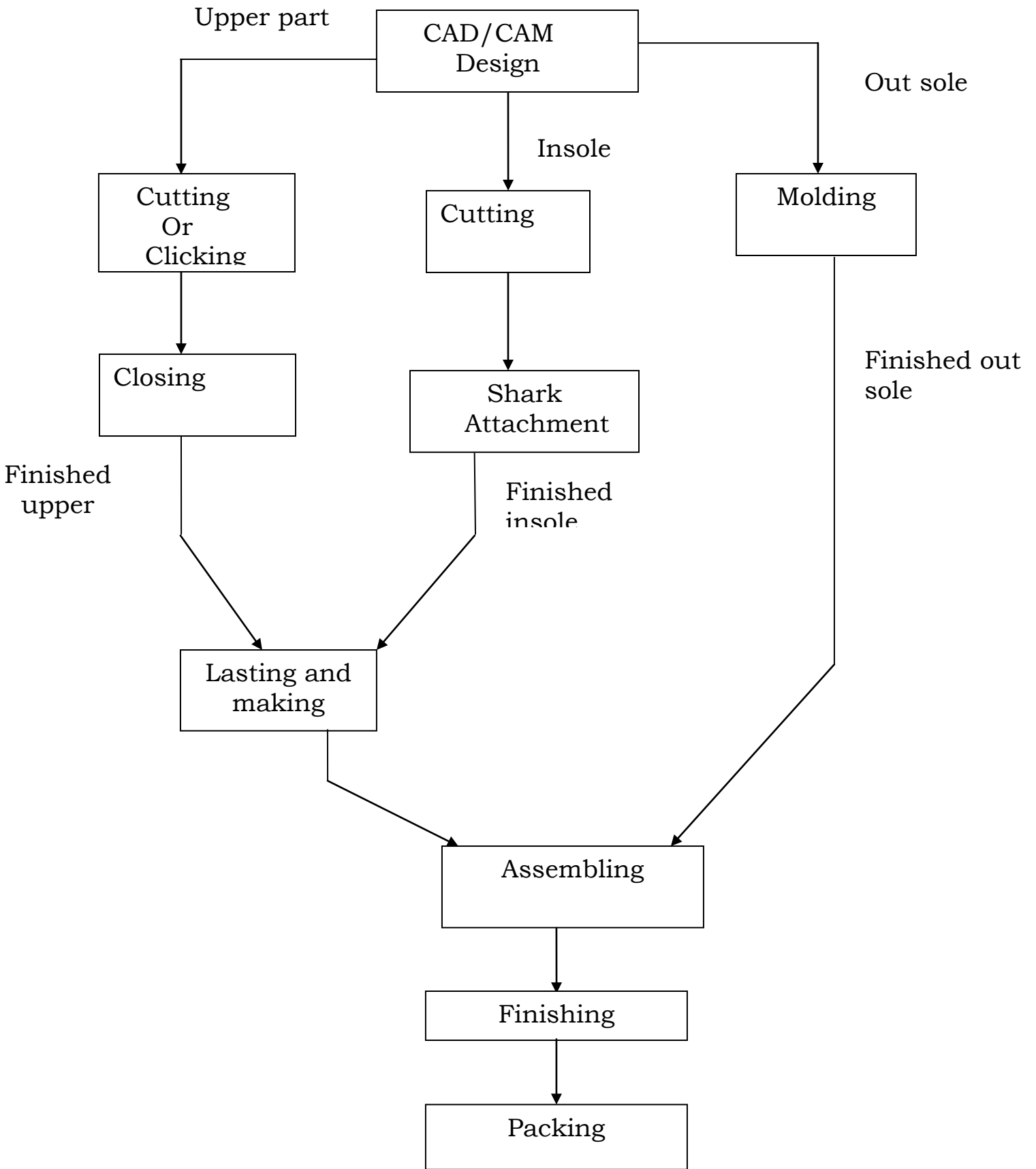


FIG 2.5 flow diagram of shoe manufacturing

Upper part preparation

In general, there are three main operations connected with manufacturing of the upper part of shoes. These are design, clicking and closing.

a) Design

This is the first stage of any shoes manufacturing factory. The design can be done either manually or using CAD. Most of the design of Ethiopian shoe manufacturers is bought from Europe, especially Italy.

b) Clicking

According to the design, operators cut and shape leather for the top of the shoe (the upper) using cutting knives, keeping wastage to an absolute minimum. The operators also take care to work around surface flaws in the raw materials, which would spoil the finished appearance.



Picture 2.1 Clicking or cutting operation

b) Closing

At this stage operators stitch together sections for the upper either by hand, or by using a semi-automated sewing machine. Skiving is done before sawing the uppers. Also the operators work on edgings and put in eyelets during this stage.



Picture2.2 Skiving operation



Picture2.3 Closing operation



Picture2.4 Finished upper part of shoes

Insole preparation

At this stage, there are two main operations, i.e. cutting and attaching shank.

a) Cutting

The insole raw material, which is leather board (scarped leather which is high quality) or cellulose board (scrapped wood), is cut according to the design using cutting knives.



Picture2.5 Insole cutting operation

b) Attaching shank: - At this stage shank is attached to the insole to support the load of humans and to avoid deformity of the shoes (to keep the shape of the shoe).



Picture 2.6 Attaching Shank to the insole

Outsole preparation

The raw material is inserted to the sole preparation machine or mold. Here the scraps are recycled to produce another sole. The raw materials for sole production are PVC, TR and PU.



Picture 2.7 Sole making machine and molds



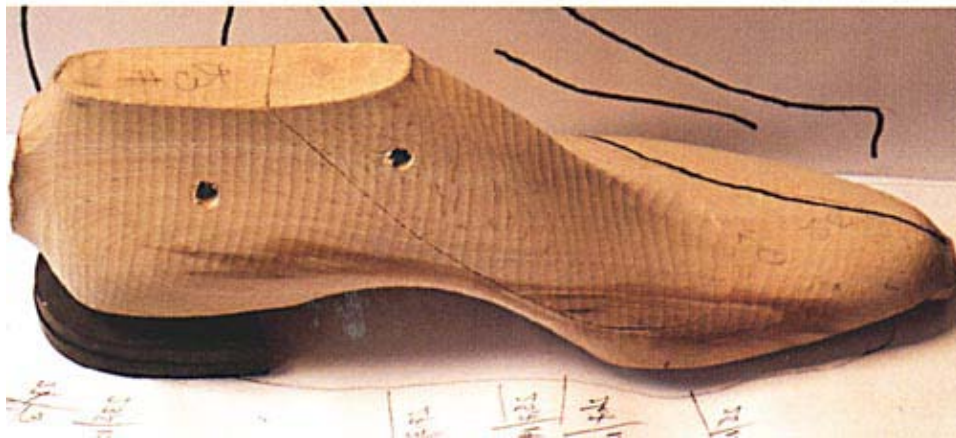
Picture 2.8 Raw material and recycled scraped soles

Lasting & Finishing

Up to now we have three finished products which are ready for assembly i.e. the upper part, bottom part and sole. Hence the next step will be assembling these out puts to have complete shoes. Mainly there are three processes at this stage: - lasting, roughing and sole bonding.

a) Lasting

At this operation the upper and bottom part of the shoe are molded together using finished shape on a wooden or metal frame known as a 'last'. This is done either manually or using machine.



Picture 2.9 Lasts



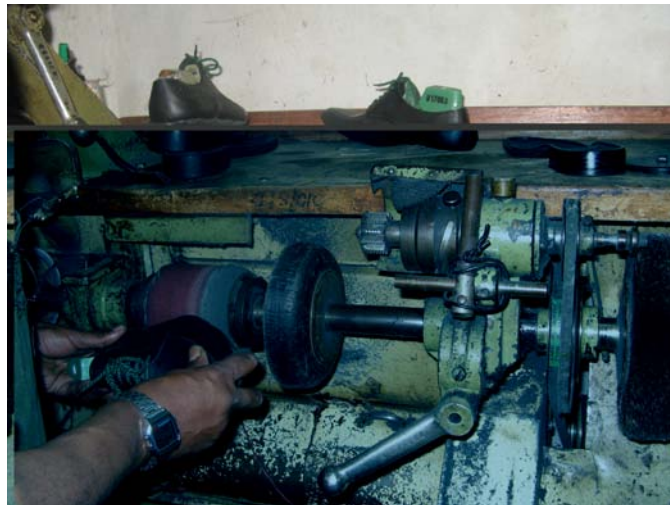
Picture 2.10 Automatic and manual lasting



Picture 2.11 Out put of lasting

b) Roughing and assembling

Here operators trim and buff soles and heels. They also assemble and remove the lasts. Also at this stage, the operators stain, polish and wax products, and fit laces and tags. The shoes will then go on to be boxed and packaged ready for dispatching to the customer.



Picture 2.12 Roughing



Picture 2.13 Out put of roughing



Picture 2.14 Glue painting



Picture 2.15 Heating



Picture 2.16 Assembling



Picture 2.17 Painting and packing

CHAPTER THREE

METHODOLOGY AND DATA COLLECTION

This chapter focuses on the methodology that has been used and the data collection to improve productivity of OK Jamaica Shoe factory on the basis of human resource management, material resource management and method study.

3.1 Methodology

The methods employed to achieve the objectives of the research by taking OK Jamaica shoes factory as a case study include: Different related reading materials like books, journals and internet sources are referred to have a thorough understanding of productivity in relation to human and materials resources that can address the problems of materials and human resources management in Ethiopia shoes factories. Also different electronic documents as well as books are referred to have a clear understanding of method study technique which helps to increase productivity.

The data is collected through:

- Discussion with section heads, supervisors, operators and concerned people
- Site visiting
- Conducting interviews
- Productivity records; and
- The process flow / activity chart
- Resource utilization records, etc

The data is analyzed using a proper technique of material and human resource management and method study procedures to develop a material and human resource management system that incorporate method study concept to improve the productivity of the organization significantly.

3.2 Data Collection

The preliminary data collection is carried out using different methods. This methods includes Shoes factory visits, Shoes related organizational institutions visits, conducting interviews, distributing questionnaires and filling data sheet. The secondary data is collected from available electronic documents as well as different books, journals and magazines. The data collection is related to productivity improvement through human resource, material resource and work study method and focused in OK Jamaica shoes factory. Some additional data is also collected from different shoes factories and related organizations to support the analysis and the conclusion.

Frequent visit (once in two weeks time for the whole semester) was made to OK Jamaica shoes factory. Generally the data collection can be categorized in to three groups: - Data collection at OK Jamaica shoes factory, data collection at other shoes manufacturing factories and Data collection at organizations that are related to shoes factories.

3.2.1 Data Collection at OK Jamaica Shoes Factory

Data is collected in OK Jamaica Shoes factory through interviews with the owner (general manager), Technical supervisor and other employees; (see Annex-A for detail interview questions); and filling data sheet.

Since the paper focuses only in productivity improvement though human resource management, martial resource management and method study, the data is shown accordingly.

Human resource management

Conducting Job Analysis interviews, direct observation and documents reviewing are the methods used to collect data for the analysis of productivity improvement through human resources management of the organization. The company doesn't have proper organizational structure.

OK Jamaica Shoe factory has 40 male and 40 female employees that are working in the different departments as shown in table 3.1. The research mainly deals with the direct labor force that has direct contact with production; hence the base of data collection is at these areas.

Operation	Male Employees	Female Employees	Total
Cutting	2		2
Skiving		1	1
Upper Preparation & Closing	1	13	14
Insole Preparation	1	2	3
Lasting	7		7
Quality Control	1		1
Washing sole with chemical	1		1
Sticking	2		2
Painting with Glue	1		1
Assembling	1		1
Finishing	3	4	7
TOTAL	20	20	40

Table 3.1. Number of employees at each operation

Findings from Job Analysis Interviews & observation

Interview, discussion and direct observation and reviewing employee log are the methods of data collection used. The findings are summarized under jobs, duties and responsibilities, education and training, experience, knowledge, skill and abilities (KSA), organization of work (job design), working environment, supervision and motivation .

Duties and Responsibilities

- There is no job description prepared.
- There is no proper organizational structure.
- Misplacement of one's duties and responsibilities and uneven loading of activities to one person is seen.
- The responsibility of collecting leather wastes is not given to anybody.

Education and training

- Almost all the employees of the factory lack proper education, they developed their skill through experience only.
- Employment is carried out only by looking up their work and experience.
- There is no continuous training.

Experience

- Most workers have a considerable work experience in the making of shoes.
- The older employees share and teach their experience to the new employees of the factory.

Knowledge, Skill and Abilities (KSA)

- The KSA of the workers in the different sections is not upgraded through training or experience sharing with other shoe factories.

Organization of work (Job design)

- One worker is seen to cover two or more position as per the urgency of some jobs.

Working Environment

- Congestion of employees is observed due to limited space as shown in picture 3.1. (see annex C- for the existing plant layout)
- There is no cafeteria in the factory
- There is sun light coming through the window that create heat in the afternoon.
- Uncomfortable chair and working tables for the laborers
- Appropriate safety tools are not available
- There is only one toilet for both male and female employees.



Picture 3.1. Congested working condition

Supervision

- The employees do not follow the order of the supervisor, who is the sister of the owner.

Motivation

- Most of the workers do not have a team working spirit.
- No incentive system is present to motivate the work force.

Material resource management

The data collection methods implemented to analyze the productivity improvement of the factory through materials management are interview and discussions with the direct labor of the factory. Other supporting data was collected by reviewing different documents of the concerned sections and direct observation at the production site.

Materials of the organization

Raw Materials: The major raw materials are Leather from cattle (supplied from Awash, Dire and Modjo Tanneries), Glue, Sole (imported), Leather Board or Cellulose board (Imported), chemicals and nails.

According to the owner, currently there is scarcity of leather due to the high demand and those that are supplied are with low quality because the government gives focus to export.

In-process goods: The in processed goods include upper part, insole and sole.

Finished Products: The Finished products are largely men shoes, soccer shoe and some small hill female shoes.

Plant Activity

The overall production operation is performing one shift per day and 8 hours per shift for six days a week.

Production processing capacity and materials consumption

- The overall production operation is performing one shift per day and 8 hours per shift.
- The factory has manufacturing capacity of 240 shoes per shift.
- With the existing situation, from 16 square feet leather (the standard size) five pairs of upper part are prepared.

Organization performance

The organization plans its production as well as sales traditionally and production starts whenever there is a request from the customers.

Purchasing

Raw material is purchased by the general manager or his sisters from selected tanneries, Italian sole, design & chemical suppliers and some small scale shops. The factory keeps stock of raw materials for fifteen production days.

Inventory

The Stock keeper (sister of the owner) registers the daily stock position of raw material as well as finished material. The ending stock of all the raw materials, in process goods, finished product inventory and chemicals is counted every fifteen days for the purpose of salary and annually by the store keeper.

The factory has one congested ware house as shown in picture 3.2 for both raw material and finished goods.(see annex C-for the existing warehouse layout)



Picture 3.2 Ware house of the factory

The physical movement of materials

The in-process and finished products are transported from process to process through trolley and the packaging process is performed manually. The wastes from the leather are used as energy for cooking.

Method of doing work

Currently there are about fifteen models of shoes that are manufactured in Ok Jamaica shoe factory. According to the time they take to manufacture, the models can be categorized in to three groups. That is longer, medium and smaller manufacturing time. For the data collection on the method of doing work three models are selected from each category, Model 705(takes smaller time to

manufacture compared to other models), model 707(takes medium time to manufacture) and model 4U2 (takes longer time to manufacture) and data is collected for one pair of shoe. The selling prices of the shoes vary from 150 birr up to 250 birr per pair of shoe.

Model Type	Classification	Age	Remark
4U1,2,3	Longer time	2 years	
210, 203	Smaller time	10 years	
302	Smaller time	10 years	
705-707	Average time	2 years	
708-711	Smaller time	<1year	
501	Smaller time	10 years	
GS3,4	Average time	1 year	
Soccer	Smaller time	6 years	

Table 3.2 Existing number, age and type of models in OK Jamaica factory

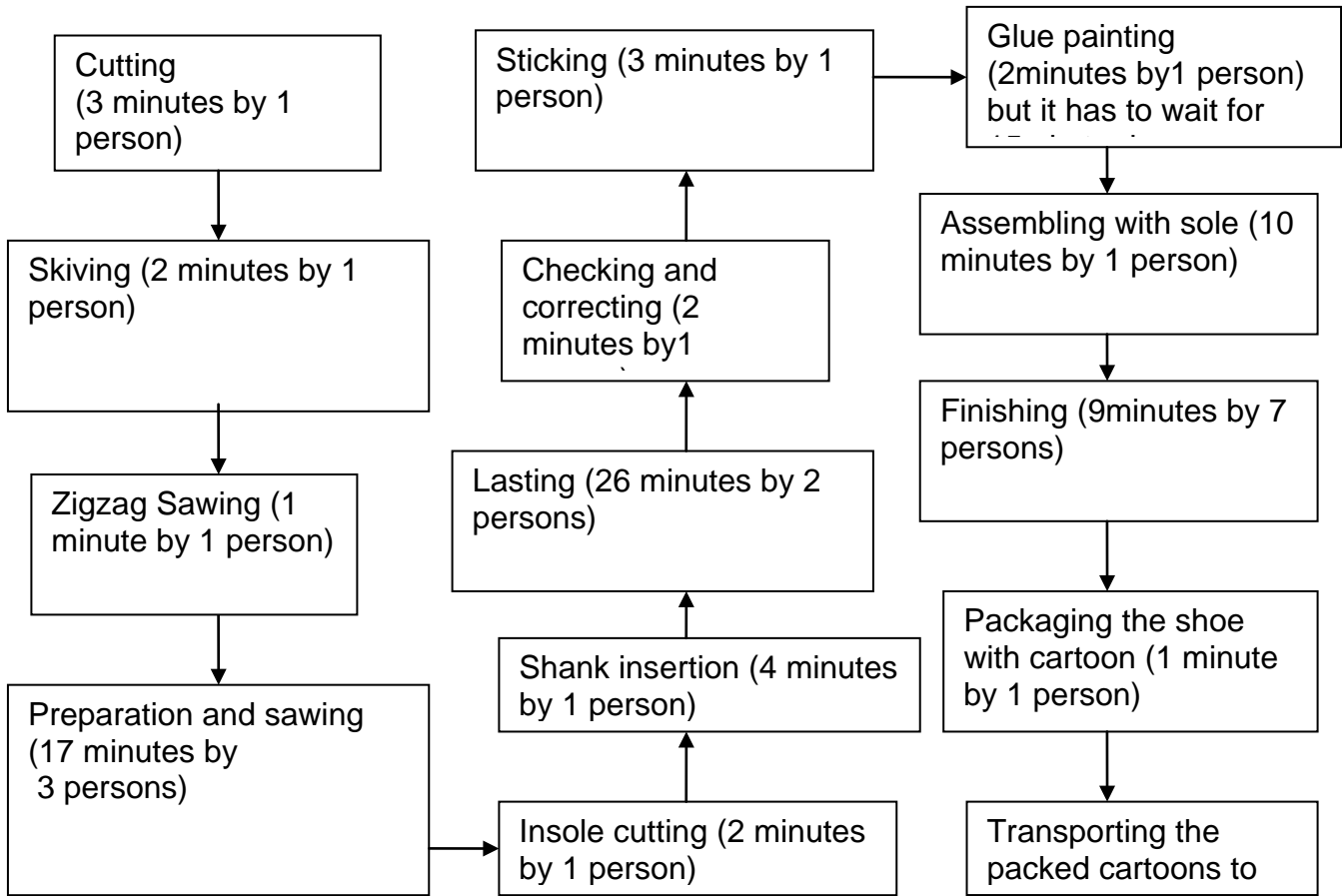


Fig.3.1 Activities for model 705 and small time taking category 1

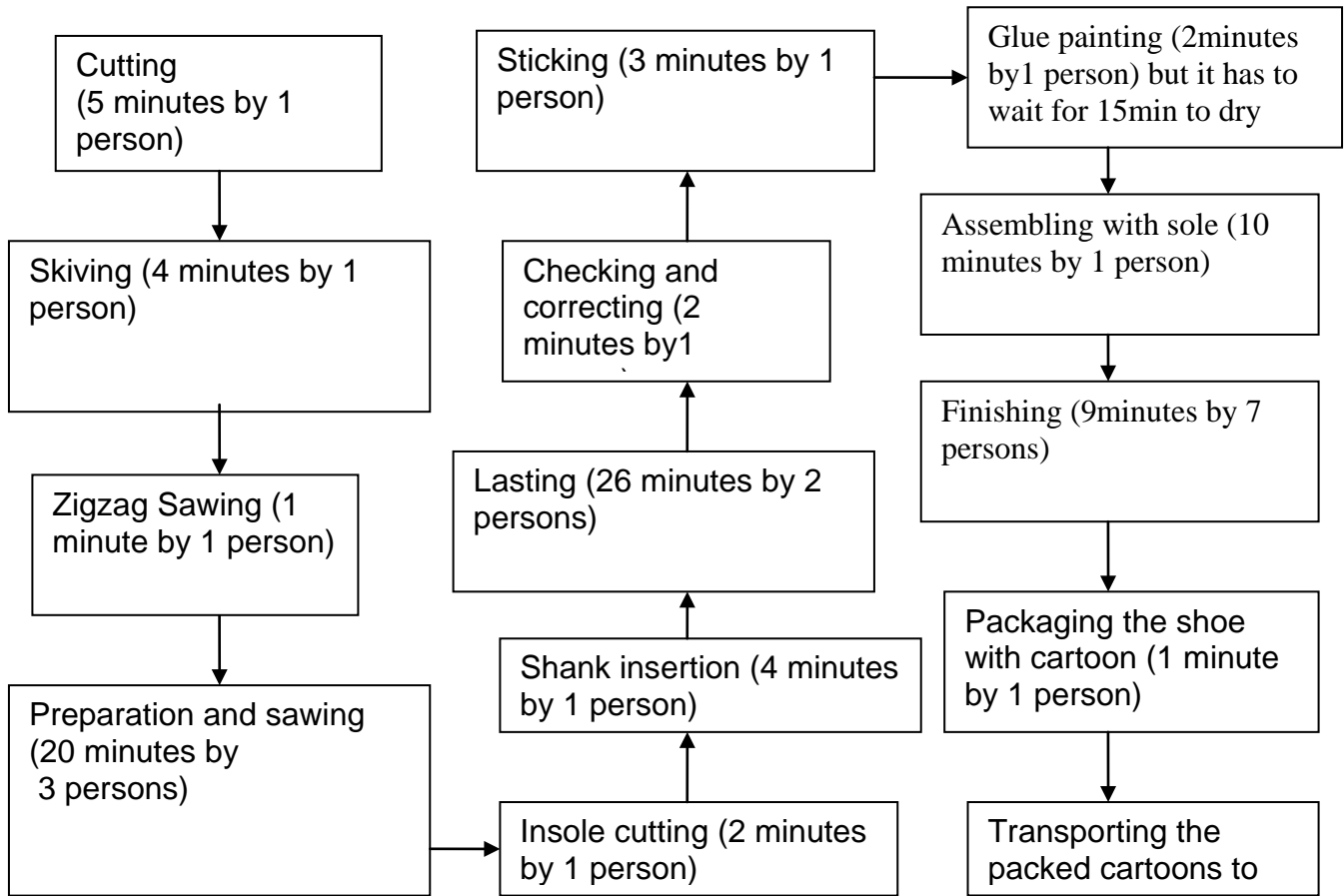


Fig.3.2 Activities for model 707 and average time taking category 2

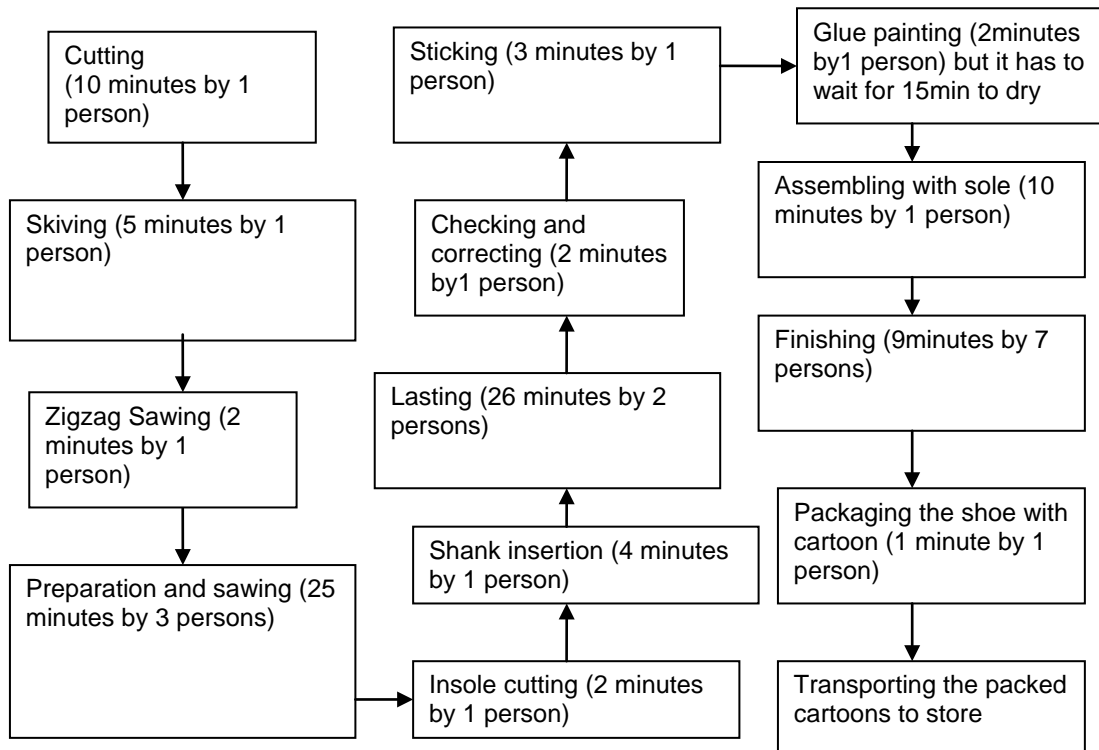


Fig.3.3Activities for model 4U2, category 3

3.2.2 Data Collection at Other Shoes Manufacturing Factories

In addition to the case study factory a visit is made to Shoe factories as shown in table 3.3 and interview is conducted with the owners or production managers. These factories are selected by the government to facilitate and support them to start exporting shoes in large quantities. The data collected, contacted person, observed problems as well as list of the factories is summarized in the following table: -

No.	Company	Contacted person and title	Installed capacity (pairs per day)	Actual out put (pairs per day)	Remark
1	Peacock	Mr. Dawit (Technical manger, Industrial engineer)	3,000	2,500	Works in joint venture with Italy company and all its products are exported
2	Tikur Abay		3,000	2,200	Under process to be privatized by Midroc Ethiopia
3	Anbessa	Mr. Eneyew	2,100	400	Started exporting
4	Kangaroo	Mr. Ephrem	1,200	400	Started exporting
5	Ras Dashen	Mr. Yared	500	250	Started exporting
6	Walya	Ms. Bisrat	300	200	Started exporting
7	Ramse	Mr. Zelalem, Owner & GM	300	150	Started exporting
TOTAL			10,100	5,950	

Table 3.3 Summery of data collection to other shoe factories

3.2.3 Data Collection at Organizations that are related to shoes factories

There are different kinds of governmental and no governmental institutes that give support to the shoes manufacturing sector. And in order to have full coverage of all the areas that are related to shoes factories data is collected from the following institutes.

Leather and Leather Products Technology Institute (L.L.P.T.I.)

LLPTI is a governmental organization that is established in 1997. The main objectives of the institute concerning the foot wear sector are:-

- to give technical support to shoes factories including CAD/CAM
- Gives shoes manufacturing trainings
- Research and development
- Rents its highly mechanized machineries to the shoes factories with a fair price

Three visits are made to the institute and interviews have been made with foot wear manufacturing department head, with instructors and technicians. In addition to the books and journals the following data is collected from the institute: -

- Standard shoes manufacturing procedure
- The kind of supports they give to shoes sector
- The training cost for one person is 300 birr per month and the training includes all foot wear technologies(from design to packing) that is to finished within 10 months (six hours per day and five days per week)
- That the institute is not giving the expected service due to shortage of man power, unclose relation ship with the shoes manufacturers and etc.

Ministry of Trade and Industry

This is also governmental owned organization and its main objective concerning to the shoes sector is to give support. According to leather & textile department expert, the support includes tax free accessories, tax free samples, tax free machineries, making available land for factory building and making sure that cements are available for construction (if there is production problem).

The list of registered mechanized shoes factories is collected from this organization through interview that is conducted with Leather and textile department expert. The organization also makes a bridge between the shoes factories and foreign purchasers to facilitate the export of the shoes. According to the information from the organization the following export figures are recorded in December, 2006.

No	Company	Export amount in USD	Month & Year
1	Peacock	433,762	December, 2006
2	Anbesa	64,936	December, 2006
3	Ramse	19, 665	December, 2006

Table 3.4 Exported shoes in December, 2006

The government considers the shoes factories as priority sector because

- It is labor intensive (manufacturing of shoes involves lots of employees)
- The raw material is leather and Ethiopia is number one in Africa in live stock population[30]
- It is export oriented
- The sector has high demand and etc.

United Nations Industrial Development Organization (UNIDO)

UNIDO is non governmental organization that gives support to any Industrial activities. Short interview is conducted with the shoes industry project coordinator. The organization has fund for trainings and research. For example

UNIDO gives fund in the form of training and support for cluster (an association of 700 medium shoes manufacturers).

Others

Phone conversations that are made concerning the shoes sector are summarized in the table below.

No	Organization	Contacted person	Title
1	Ethiopian Leather Industries Association (ELIA)	Mr. Abdisa	Chair person
2	Ethiopian leather foot wear Cluster (700 small scale shoes factories associated)	Mr. Paulos Endeshaw	Chair person

CHAPTER FOUR

DATA ANALYSIS

Identifying the influencing factors to the low productivity of the organization is the primary step of analyzing productivity. High production cost and inefficiency of machineries are the contributing factors of low productivity as it can be seen in the following figure.

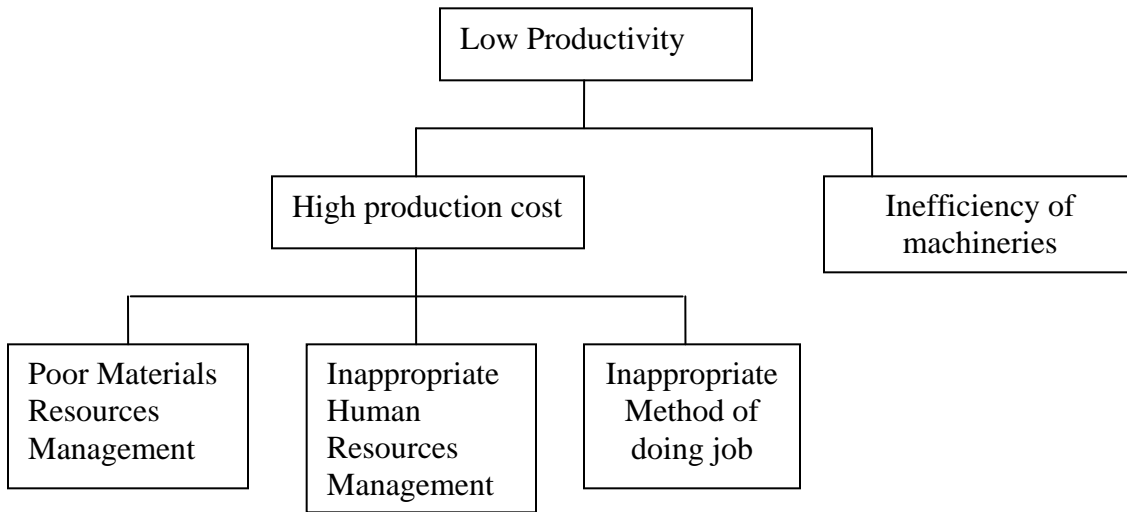


Fig.4.1 Factors for the low productivity of OK Jamaica Shoe Factory.

The next step of the analysis would be identifying the root cause of the low productivity problem of the factory. The following cause-and effect diagram shows that high production cost and increasing the efficiency of the machineries are the causes for low productivity of OK Jamaica shoe factory. Of these causes, the basic cause to the effect of low productivity that affects organization's competence in the local as well as international market by increasing its unit sales price lies in the high production cost. Since shoe industries invest greater share of capital on material and human resources, analyzing the materials and human resources management would increase the productivity of the factories by minimizing production cost.

Moreover, replacing the old machines require a very high amount of investment than reduction of the currently existing production costs of the organization through efficient material and human resources management system. Hence, the ones that can be implemented easily with very much less investment cost, using the existing resources and taking the low economic status of the company in to consideration are selected for productivity analysis. Therefore, management of materials and human resources would increase the organization’s productivity by decreasing the high production cost with a small amount of investment.

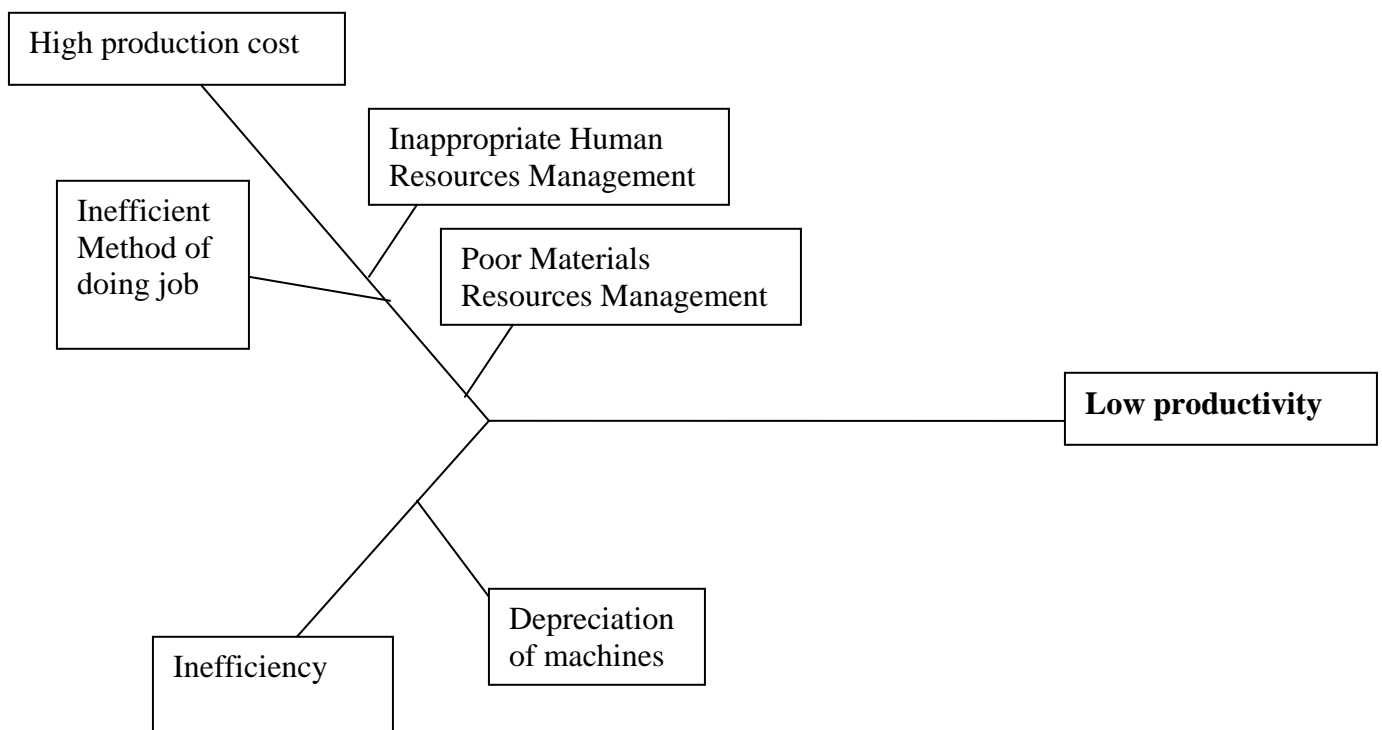


Fig.4.2 Cause – and – Effect diagram for the low productivity of OK Jamaica Shoe Factory.

4.1 HUMAN RESOURCES MANAGEMENT

The findings of Job interview and observation are used for the analysis of human resources productivity improvement in Ok Jamaica Shoe Factory. The direct labor, which have direct contact with the production processes are analyzed.

Job Analysis

Each job is analyzed to increase the productivity of the workers of the factory. Duties and responsibilities; education and training; experience and knowledge, skill and abilities (KSA); organization of work; working environment; supervision and motivation are analyzed for the whole factory.

Duties and Responsibilities

Preparing the job description according to the proposed organizational structure (see annex B) providing every worker with his/her own written job description by loading every job evenly would enable the workers to be accountable for their work.

All the employees should implement the improved method of doing jobs, which is going to be analyzed subsequently so that they would be productive.

Education and training

The following table shows the education and training need of the employees with respect to the job specification of the organization. The factory hires employees only by looking to their experience and there is no proper procedure. Actually they don't have confidence on those who have been graduated from LLPTI.

Employees	Education	Training
Cutting Machine operators	Diploma or Certificate from LLPTI, one year for the certificate (foot wear technologist), and three years for diploma.	Optimum and modern cutting technique, keeping the wastes as low as possible
Stitching Machines Operators	Diploma or Certificate from LLPTI, one year for the certificate (foot wear technologist), and three years for diploma.	Stitching modern technology
Operators involved in lasting	Diploma or Certificate from LLPTI, one year for the certificate (foot wear technologist), and three years for diploma.	Proper and modern lasting techniques
Operators involved in Assembling	Diploma or Certificate from LLPTI, one year for the certificate (foot wear technologist), and three years for diploma.	Modern assembling technologies

Table 4.1 Education and Training need

Experience and Knowledge, Skill and Abilities (KSA)

Upgrading the KSA of the workers in the different sections through training or experience sharing with other factories as well as with LLPTI would enable them to produce more with the same material and time consumed since most of them have adequate working experience. Moreover, organizing a library would continuously update the KSA of workers and eliminate their non-productive activity.

Organization of work (Job design) and Working Environment

Rotating workers from one section to another, enlarging and enriching jobs would enable them to attain higher motivation to do more. In addition, aiding appropriate working facility and eliminating unnecessary and repetitive motions would decrease the employees' fatigue thereby improving the workers' productivity.

Supervision and Motivation

Convincing the employees to accept the supervisor would be advantageous. Also there should be continuous training for all the employees to create team working spirit. The employees should have strong relations with the general manager as well as all the management staffs to create motivation; in addition to that there should be recognition and incentive to the employees who work hard (like employee of the month to create competition between them).

Working Environment

As it can clearly be seen in the data collection, there is congestion of employees due to limited space which can be partially solved by properly rearranging the machineries, putting shelves and using proper material handling system (see annex D for the proposed plant layout). Again, in order to have a better working environment it is good to have one additional toilet with a minimum cost. In addition the heat in the afternoon could be avoided using low cost ventilation system.

4.2 MATERIALS MANAGEMENT

Here the major raw material is leather from cattle and fortunately our country is number one in Africa with this raw material. The factory should give more emphasis on this raw material to avoid unnecessary wastes.

Almost all shoe manufacturing factories in Ethiopia, including OK Jamaica, imports the sole from abroad hence there should be a system to make the soles available in the local market.

The wastes of the leather from the factory are collected and sold as energy for cooking. But in European countries the wastes are used to produce cellulose board which is used as a raw material for insole and currently Ethiopian shoe factories are importing.

Purchasing

Every organization invests a considerable amount of capital on purchasing. Recently, OK Jamaica shoe factory has a capacity to produce 240 pair of shoe per one shift and the purchase is carried out for fifteen days production. According to the information from the supervisor currently there is scarcity of raw material which affects the moral and the consistency of the employees.

The purchase of the raw materials is not carried out through definite path or system; it is done arbitrary by the general manager or one of his family members.

For every design mold is required to manufacture sole with approximate cost of 100,000birr and to return its initial investment it should at least produce 20,000pair of soles. But for one model shoe the demand could be around 5,000 pair of soles which forces most of Ethiopian shoe factories including Ok Jamaica to import the sole.

Forecasting

The factory doesn't have any forecasting technique; they decide the production capacity of shoes traditionally.

4.3 METHOD STUDY

Since shoe manufacturing involves few operations the method study is carried out for the whole operation taking three models. As mentioned in the data collection, recently there are about fifteen models and these models can be categorized in to three according to the time they take to manufacture. In shoe manufacturing there is almost no movement for the workers except during transporting from one process to other which is small distance hence the movement of the material and the operation of the employees are studied.

The following material flow process charts are used to record the actual method of doing work in the factory for the selected three models.

Model 705 Present

Flow process Chart		Worker / <u>Material</u> / Equipment type						
Chart No. 1 Sheet No. <u>1</u> of <u>1</u>		Summary						
<i>Subject charted:</i>	<i>Activity</i>	<i>Present</i>	<i>Proposed</i>	<i>Saving</i>				
<i>Activity:</i> shoe manufacturing	<i>Operation</i> ○	14						
	<i>Transport</i> ⇨	6						
	<i>Delay</i> D	1						
	<i>Inspection</i> □	1						
	<i>Storage</i> ▽	1						
<i>Method:</i> <u>Present</u> / Proposed	<i>Total</i>	18						
<i>Location:</i> Shoe manufacturing plant	<i>Distance(m)</i>							
	<i>Time (work-min)</i>	104						
<i>Charted by:</i>	<i>Cost: Labor</i> <i>Material</i>							
<i>Approved by:</i>								
<i>Date:</i>								
<i>Description</i>	<i>Dist (m)</i>	<i>Time min</i>	<i>Symbols</i>					<i>Remarks</i>
			○	⇨	D	□	▽	
Raw material (leather) stored in the temporary store in the factory								
Inspection of the raw material		2					1 operator	
Cutting operation		3					1 labor	
Transported to skiving operation	1						„	
Skiving operation		2					„	
Zig Zag sawing		1					„	
Transported to Preparation and sawing	3						„	
Preparation and sawing		17					3 labors	
Insole cutting		2					1 labor	
Shank Insertion		4					„	

Transportation of upper and insole to lasting operation	3							”
Lasting		26						2 labors
Checking and correcting		2						1 labor
Transporting to sticking	2							1 labor
Sticking		3						1 labor
Glue painting		2						1 labor
Waiting for the glue to dry		15						
Heating		5						1 labor
Assembling with sole		10						1 labor
Transporting to finishing operation	6							1 labor
Finishing		9						7 labors
Packing		1						1 labor
Transporting to storage place	3							1 labor
Total	18	104	14	6	1	1	1	

Table.4.2 Material type flow process chart of the present method for model 705

Model 4U2 present

Flow process Chart		Worker / <u>Material</u> / Equipment type		
Chart No. 1 Sheet No. <u>1</u> of <u>1</u>		Summary		
<i>Subject charted:</i>	<i>Activity</i>	<i>Present</i>	<i>Proposed</i>	<i>Saving</i>
<i>Activity:</i> shoe manufacturing	<i>Operation</i> ○	14		
	<i>Transport</i> ⇨	6		
	<i>Delay</i> □	1		
	<i>Inspection</i> □	1		
	<i>Storage</i> ▽	1		
<i>Method:</i> <u>Present</u> / Proposed	<i>Total</i>	18		
<i>Location:</i> Shoe manufacturing plant	<i>Distance(m)</i>			
	<i>Time (work-min)</i>	223		
<i>Charted by:</i>				

<i>Description</i>	<i>Distance (m)</i>	<i>Time min</i>	<i>Symbols</i>					<i>Remarks</i>
			○	⇒	D	□	▽	
Raw material (leather) stored in the temporary store in the factory								
Inspection of the raw material		2						1 operator
Cutting operation		10						1 labor
Transported to skiving operation	1							„
Skiving operation		5						„
Zig Zag sawing		2						„
Transported to Preparation and sawing	3							„
Preparation and sawing		25						3 labors
Insole cutting		2						1 labor
Shank Insertion		4						„
Transportation of upper and insole to lasting operation	3							„
Lasting		26						2 labors
Checking and correcting		2						1 labor
Transporting to sticking	2							1 labor
Sticking		3						1 labor
Glue painting		2						1 labor
Waiting for the glue to dry		15						
Heating		5						1 labor
Assembling with sole		10						1 labor
Transporting to finishing operation	6							1 labor
Finishing		9						7 labors

Packing		1						1 labor
Transporting to storage place	3							1 labor
Total	18	223	14	6	1	1	1	

Table.4.3 Material type flow process chart of the present method for model 4U2

Model 707 present

Flow process Chart		Worker / <u>Material</u> / Equipment type						
Chart No. 1 Sheet No. <u>1</u> of <u>1</u>		Summary						
<i>Subject charted:</i>	<i>Activity</i>	<i>Present</i>	<i>Proposed</i>	<i>Saving</i>				
<i>Activity:</i> shoe manufacturing	<i>Operation</i> ○	14						
	<i>Transport</i> ⇨	6						
	<i>Delay</i> D	1						
	<i>Inspection</i> □	1						
	<i>Storage</i> ▽	1						
<i>Method:</i> <u>Present</u> / Proposed	<i>Total</i>	18						
<i>Location:</i> Shoe manufacturing plant	<i>Distance(m)</i>							
	<i>Time (work-min)</i>	111						
<i>Charted by:</i>	<i>Cost: Labor</i>							
<i>Approved by:</i>	<i>Material</i>							
<i>Date:</i>								
<i>Description</i>	<i>Dist- ance (m)</i>	<i>Time min</i>	<i>Symbols</i>					<i>Remarks</i>
			○	⇨	D	□	▽	
Raw material (leather) stored in the temporary store in the factory								
Inspection of the raw material		2					1operator	
Cutting operation		5					1 labor	
Transported to skiving operation	1						„	
Skiving operation		4					„	
Zig Zag sawing		1					„	
Transported to Preparation and sawing	3						„	

Preparation and sawing		20						3 labors
Insole cutting		2						1 labor
Shank Insertion		4						„
Transportation of upper and insole to lasting operation	3							„
Lasting		26						2 labors
Checking and correcting		2						1 labor
Transporting to sticking	2							1 labor
Sticking		3						1 labor
Glue painting		2						1 labor
Waiting for the glue to dry		15						
Heating		5						1 labor
Assembling with sole		10						1 labor
Transporting to finishing operation	6							1 labor
Finishing		9						7 labors
Packing		1						1 labor
Transporting to storage place	3							1 labor
Total	18	111	14	6	1	1	1	

Table.4.4 Material type flow process chart of the present method for model 707

The next step of method study is examining, where the different operations are subjected to sequential questioning with respect to purpose, place, sequence, person and means. After properly examining the flow carefully the lead times at cutting operation, preparation & sawing, lasting and assembling with sole are minimized. The following charts are the summary of examination of each activity.

By adopting the proposed method of doing job, the factory would eliminate its excess labor and save a considerable amount of time. The following are the

proposed material-type process charts that show the improved/proposed system of Ok Jamaica shoe factory.

Model 705 Proposed

Flow process Chart		Worker / <u>Material</u> / Equipment type						
Chart No. 1 Sheet No. <u>1</u> of <u>1</u>		Summary						
<i>Subject charted:</i>	<i>Activity</i>	<i>Present</i>	<i>Proposed</i>	<i>Saving</i>				
<i>Activity:</i> shoe manufacturing	<i>Operation</i> ○	14						
	<i>Transport</i> ⇨	6						
	<i>Delay</i> D	1						
	<i>Inspection</i> □	1						
	<i>Storage</i> ▽	1						
<i>Method:</i> Present/ <u>Proposed</u>	<i>Total</i>	18						
<i>Location:</i> Shoe manufacturing plant	<i>Distance(m)</i>							
	<i>Time (work-min)</i>	104	82	22				
<i>Charted by:</i>	<i>Cost: Labor</i> <i>Material</i>							
<i>Approved by:</i>								
<i>Date:</i>								
<i>Description</i>	<i>Dist (m)</i>	<i>Time min</i>	<i>Symbols</i>					<i>Remarks</i>
			○	⇨	D	□	▽	
Raw material (leather) stored in the temporary store in the factory								
Inspection of the raw material		2					1operator	
Cutting operation		3					1 labor	
Transported to skiving operation	1						„	
Skiving operation		2					„	
Zig Zag sawing		1					„	
Transported to Preparation and sawing	3						„	
Preparation and sawing		10					3 labors	

Insole cutting		2						1 labor
Shank Insertion		4						„
Transportation of upper and insole to lasting operation	3							„
Lasting		15						2 labors
Checking and correcting		2						1 labor
Transporting to sticking	2							1 labor
Sticking		3						1 labor
Glue painting		2						1 labor
Waiting for the glue to dry		15						
Heating		5						1 labor
Assembling with sole		6						1 labor
Transporting to finishing operation	6							1 labor
Finishing		9						7 labors
Packing		1						1 labor
Transporting to storage place	3							1 labor
Total	18	82	14	6	1	1	1	

Table.4.5. Material type flow process chart of the proposed method for mode 705

Model 4U2 proposed

Flow process Chart		Worker / <u>Material</u> / Equipment type					
Chart No. 1 Sheet No. <u>1</u> of <u>1</u>		Summary					
<i>Subject charted:</i>	<i>Activity</i>	<i>Present</i>	<i>Proposed</i>	<i>Saving</i>			
	<i>Operation</i> ○	14					
<i>Activity: shoe manufacturing</i>	<i>Transport</i> ⇨	6					
	<i>Delay</i> □	1					
<i>Method: Present/ <u>Proposed</u></i>	<i>Inspection</i> □	1					
	<i>Storage</i> ▽	1					
<i>Location: Shoe manufacturing plant</i>	<i>Total</i>	18					
	<i>Distance(m)</i>						
<i>Charted by:</i>	<i>Time (work-min)</i>	223	196	27			
	<i>Approved by:</i>	<i>Cost: Labor</i>					
<i>Date:</i>	<i>Material</i>						
	<i>Description</i>	<i>Dist- ance (m)</i>	<i>Time min</i>	<i>Symbols</i>		<i>Remarks</i>	
			○	⇨	□		□
Raw material (leather) stored in the temporary store in the factory							
Inspection of the raw material			2				1 operator
Cutting operation			8				1 labor
Transported to skiving operation	1						„
Skiving operation			5				„
Zig Zag sawing			2				„
Transported to Preparation and sawing	3						„
Preparation and sawing			15				3 labors
Insole cutting			2				1 labor
Shank Insertion			4				„

Transportation of upper and insole to lasting operation	3							”
Lasting		15						2 labors
Checking and correcting		2						1 labor
Transporting to sticking	2							1 labor
Sticking		3						1 labor
Glue painting		2						1 labor
Waiting for the glue to dry		15						
Heating		5						1 labor
Assembling with sole		6						1 labor
Transporting to finishing operation	6							1 labor
Finishing		9						7 labors
Packing		1						1 labor
Transporting to storage place	3							1 labor
Total	18	196	14	6	1	1	1	

Table.4.6. Material type flow process chart of the proposed method for mode 4U2

Model 707 proposed

Flow process Chart		Worker / <u>Material</u> / Equipment type		
Chart No. 1 Sheet No. <u>1</u> of <u>1</u>		Summary		
<i>Subject charted:</i>	<i>Activity</i>	<i>Present</i>	<i>Proposed</i>	<i>Saving</i>
<i>Activity:</i> shoe manufacturing	<i>Operation</i> ○	14		
	<i>Transport</i> ⇨	6		
	<i>Delay</i> □	1		
	<i>Inspection</i> □	1		
	<i>Storage</i> ▽	1		
<i>Method:</i> Present/ <u>Proposed</u>	<i>Total</i>	18		
<i>Location:</i> Shoe manufacturing plant	<i>Distance(m)</i>			
	<i>Time (work-min)</i>	111	88	23
<i>Charted by:</i>				

<i>Description</i>	<i>Distance (m)</i>	<i>Time min</i>	<i>Symbols</i>					<i>Remarks</i>
			○	⇒	D	□	▽	
<i>Approved by:</i>	<i>Cost: Labor</i>							
<i>Date:</i>	<i>Material</i>							
Raw material (leather) stored in the temporary store in the factory								
Inspection of the raw material		2					1 operator	
Cutting operation		5					1 labor	
Transported to skiving operation	1						„	
Skiving operation		4					„	
Zig Zag sawing		1					„	
Transported to Preparation and sawing	3						„	
Preparation and sawing		12					3 labors	
Insole cutting		2					1 labor	
Shank Insertion		4					„	
Transportation of upper and insole to lasting operation	3						„	
Lasting		10					2 labors	
Checking and correcting		2					1 labor	
Transporting to sticking	2						1 labor	
Sticking		3					1 labor	
Glue painting		2					1 labor	
Waiting for the glue to dry		15						
Heating		5					1 labor	
Assembling with sole		6					1 labor	
Transporting to finishing operation	6						1 labor	
Finishing		9					7 labors	

Packing		1						1 labor
Transporting to storage place	3							1 labor
Total	18	88	14	6	1	1	1	

Table.4.7. Material type flow process chart of the proposed method for mode 707

From the proposed methods only by proper training and motivation in some of the operations, we can observe the following: -

- Categories under model 705 (relative to other model categories small time taking) can be done with 22 minutes earlier.
- Categories under model 707 (relative to other model categories average time taking) can be done with 23 minutes earlier.
- Categories under model 4U2 (relative to other model categories long time taking) can be done with 27 minutes earlier.

4.5 Implementation costs

Here the following costs are calculated

- **Training**

In order to gain proper training, it is advisable to nominate one employee from each operation, i.e. five employees. The training cost at LLPTI is 300 birr per month per person for ten months. Hence the total cost will be 15,000 birr and the employees could practice the new method of doing jobs as well as they can update them selves with a new shoe manufacturing technology.

- **Ventilator**

The maximum number of employees at the factory are 40 and for this number and for the existing dimension of the factory one inlet and out let fan is required with a cost of 700 birr. Hence the total cost including installation will be 1,600 birr.

- **Others**

Currently the cost to construct average class toilet is around 2,500 birr per square meter, if we assume to construct a 2x2 toilet it will cost around 10,000 birr.

Hence we will have a total implementation cost of 26,600 birr and by implementing the proposed ideas we will increase human resource productivity (by the number of minutes shown for each model category) and material resource productivity (through proper training 16 square feet leather can produce 6 uppers instead of 5 by reducing wastes).

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

In the previous two chapters data collection as well as the analysis part of the thesis have been discussed. And this chapter deals with the conclusion and recommendations forwarded according to the data collection and analysis.

5.1 CONCLUSION

Productivity is the efficiency of a production system expressed by a ratio between value of output and value of input. It is the measure of how much input is required to produce a given output for a manufacturing or service giving industry.

Attaining an improved productivity by producing products at an optimal cost is an important criterion for an industry to be competent in the world of globalization where industries are running to exceed customers' expectation. Ethiopian shoe manufacturing industries have a problem of low productivity brought about by their high production cost that could be minimized through efficiently managing its main resources, i.e. human and material resources. Similar problems are observed in OK Jamaica shoe factory with less human resource productivity and material resource productivity which implies there is inefficient utilization of the two resources.

Improved productivity of OK Jamaica shoe factory would be achieved through effective and efficient human resources management by having qualified employees with increased motivation and teamwork spirit; improved job design; regular job analysis; improved method of doing work that simplifies the movement of materials and workers.

Thus, the factory would be productive and competent in the local as well as global market by reducing its high production cost through effective and efficient management of materials and human resources.

5.2 RECOMMENDATIONS

All researches are made to solve problems. Implementing researches, which are able to solve the major problems of a manufacturing or service providing industry, is the most important factor to survive in the world market. In Ethiopia, very low productivity is the major problem of shoe manufacturing factories as the case- study organization, OK Jamaica Shoe factory. The general manager (the owner)of the factory need to come up with a decision to benefit from the results of this research to improve the factory's productivity by decreasing the high production cost through effective and efficient management of materials and human resources. For the successful implementation of this productivity improvement system in the organization, the following points are recommended:

Human Resources Management

- ✚ The factory should implement the organization structure proposed (annex-B).
- ✚ There should be a job description for each employee.
- ✚ Employment procedure should be proper through administration.
- ✚ One additional toilet should be built.
- ✚ The problem of congestion can be partially solved by including shelves in the factory for temporally storing the work in progress goods.(annex-D)
- ✚ To avoid the heat in the afternoon good ventilation system should be built.
- ✚ Developing an incentive system to all departments of the organization.
- ✚ Updating the workforce with the necessary training and education
- ✚ One employee from each department to be trained in LLPTI with a total cost of 15,000 birr for ten months.

Material resource Management

- ✦ Following the proposed organizational structure all kinds of purchase should be done through the finance department.
- ✦ The mode of transportation of the work-in-progress should be replaced by trolley which has a rack on it.
- ✦ Properly managed warehouse should be rearranged for raw material and finished goods. (Annex-D)
- ✦ Wastes of the raw material (leather) should be collected from all leather product manufacturers and be used to manufacture leather boards which are raw material for imported insole.
- ✦ Optimization of inventory holding cost by effective forecasting for the finished product, and efficient materials requirement planning of the raw materials and work-in-process inventory.

Method of doing work

- ✦ Implementation of the improved method of doing work by the method study procedure.
- ✦ Maintain the new method of doing work by effective implementation.

Thus, OK Jamaica shoe factory would be able to improve its productivity and become competent in local as well as international market.

6. FUTURE WORKS

To improve the productivity of the company further interested researchers can make further research on:

- Proper Plant layout design and erection for the new OK Jamaica shoe factory that will help the factory to become more productive when it is operational.
- Software development to computerize the integrated materials and human resources management system.

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Annex-A- Interviewed questions to OK Jamaica shoe factory

General

1. What kind of assistance do you get from governmental & non governmental organizations like LLPTI, UNIDO & Ministry of trade & Industry?
2. Short history about your factory, from the year of establishment up to now?
3. What is your future plan?

Human resource

4. What is the number of employees at each department?
5. What is the educational background and experience of each employee?
6. What is your observation on the working environment of the factory?
7. How do you supervise the employees?
8. How many hours & shifts do your employees work?

Material resource

1. What is the raw material, work-in-process material and finished product of the factory?
2. Where do you get the raw materials?
3. What is the daily production capacity? And daily raw material consumption?
4. How do you carry out purchasing of different materials to continue production of shoe?
5. Who does the daily counting?
6. What are the selling prices of the shoes?
7. How do you forecast the demand?

Annex-B- Proposed organizational structure

