Assessment of Job Design and Work Measurement in REPI Soap and Detergent Factory in Addis Ababa

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Introduction

Background of the Study

The operations manager's job, by definition, deals with managing the personnel that create a firm's products and services. To say that this is a challenging job in today's complex environment is an understatement. The diversity of the workforce's cultural and educational background, coupled with frequent organization restructuring, calls for a much higher level of people management skills than has been required in even the recent past (Chase, Jacobs, Aquilano, and Agarwal 2006, p. 126).

The objective in managing personnel is to obtain the highest productivity possible without sacrificing quality, service, or responsiveness. The operations manager uses job design techniques to structure the work so that it will meet both the physical and behavioral needs of the human worker. Work measurement methods are used to determine the most efficient means of performing a given task, as well as to set reasonable standards for performing it. People are motivated by many things, only one of which is financial reward. Operations managers can structure such rewards not only to motivate consistently high performance but also to reinforce the most important aspects of the job (Ibid, p. 126).

The importance of work system design is underscored by an organization's dependence on human effort (i.e., work) to accomplish its goals. Work design is one of the oldest aspects of operations management. In the past, it has often been de-emphasized in operations management courses in favor of other topics. Recent years, however, have seen renewed interest that has come from somewhat different directions: some of the interest has been sparked by increasing concerns over productivity. It is perhaps ironic that one of the oldest fields of operations management is now an important key to productivity improvement and to continuous improvement (Stevenson 2009, p. 321).

The building blocks of organizational structures are the jobs people perform, and a major cause of organizational effectiveness is employee job performance. Job design refers to the process by which mangers decide individual job tasks and authority. Apart from the very practical issues associated with job design—issues that relate to effectiveness in economic, political, and monetary terms, we can appreciate its importance in social and psychological terms. Jobs can be sources of psychological stress and even mental and physical impairment. On a more positive note, jobs can provide income, meaningful life experiences, self-esteem, esteem of others, regulation of our lives, and association with others. Thus, the well-being of organizations and people depend upon how well management is able to design jobs (Ivancevich and Matteson 1990, p. 470).

This study, in a general matter, attempts to give sufficient emphasis and comprehensive study on the subjects of design of work systems. Its main focus is on the concepts of job design and work measurement. It attempts to give a thorough explanation of the methods and procedure used in designing

specific jobs and in measuring work and also tries to address other issues and matters concerned and related to it.

Statement of the Problem

An operations manager uses job design techniques to structure work to meet the physical and behavioral needs of the employee. Work measurement methods are used to determine the most efficient means of performing a given task, as well as to set reasonable standards for performing it. Work performance standards are important to the workplace. So accomplishment can be measured and evaluated. Standards permit better planning and costing and provide a basis for compensating the work force and even providing incentives.

The purpose of this study is to describe as well as understand the concepts of job design and work measurement by using a qualitative research design resulting in a case study. At this stage, in the research the concept of job design and work measurement will be defined generally as the methods employed to specify the contents and methods of jobs, and the assumed length of time it should take to complete those jobs.

In light of the above stated research problem, some of the fundamental questions that will be explored in connection with job design and work measurement includes the following:

- What do job design and work measurement entail?
- What are the main objectives of job design with regard to employees?
- Which approaches to job design are extensively applied?

- What are the most widely used methods of work measurement, and which of these methods yield the highest productivity?
- Which individuals are crucial to the development and determination of job designs and work measurements?
- What kinds of working conditions are considered while designing jobs?

Objective of the Study

In light of the above stated questions, this research study tries to serve the overall objective of gaining a comprehensive knowledge and providing an in-depth analysis of design of work systems. In view of this generalization, it aims at addressing the following specific objectives:

- To understand the processes and approaches involved in job design and work measurement;
- To identify possible problems that might arise from design of work systems;
- To forward probable solutions to the most common setbacks;
- To apprehend the impact of working conditions on job design, and
- To identify the importance of design of work systems on the society as a whole.

Methodology (Methods and Procedures)

Research Design

With due consideration to the different types of research paradigms, the one most suitable for this particular study is the phenomenological paradigm, or otherwise known as qualitative research method. Since this research study is concerned with understanding human behavior from the participant's own

frame of reference, it is assumed that a qualitative research design is more applicable.

The methodology for this study is a case study since the study has the intention of focusing on understanding the dynamics present within a single setting. The type of the case study is of the descriptive and explanatory types. With this regard, the unit of analysis is taken to be a body of individuals i.e., an organization.

Population and Sample Size

The company, chosen as the case study for this research paper, was REPI Soap and Detergent Factory. The population under consideration was the company itself, and the individuals (employees, managers, etc) currently working in the company. Employees include those working full-time, part-time and those working on contracts basis. The size of the population was 466, 292 males and 174 females. In order to obtain the necessary and sufficient data, the sample size determined from this population was 60 individuals, which was approximately 12.9 % of the population.

Sources of Data and Method of Data Collection

In order to fully complete this research, data were collected so that vital information could be identified and obtained. Out of the two main sources of data, primary and secondary data, facts were compiled from a combination of both. The main primary data source was survey data, which, for the most part, was obtained in an uncontrolled situation mostly by asking questions. And from data which already existed, or secondary data, books, documents

and the web were taken as the major sources. Internal records kept by the organizations were also encompassed.

The types of data gathering techniques that were extensively used in this study to collect the necessary data were questionnaires and interviews. The questionnaires encompassed close-ended questions. On the other hand, the interview associated with qualitative methodologies was conducted in a face-to-face manner with individual respondents. The type that is selected for this specific purpose was semi-structured interview, and the questions were open-ended.

Sampling Techniques

For this study, as pointed out earlier, the sample size was 60. The sampling technique used to reach at the specified sample size is probability sampling technique, out of which stratified sampling was applied. In order to avoid the occurrence of bias, the sample tried to give the views of each sections of a population in a balanced way and was made up of members from each section of the population.

Method of Data Analysis

After the collection of adequate and relevant data, doing the analysis of data in a meaningful and thorough way is the next necessary step. Descriptive statistical analysis was used, where the data collected were tabulated and consequently percentages were calculated on the basis of total sample size under investigation. Furthermore, for the reason of variation, different graphs were used to provide a more meaningful portrayal of the obtained results.

Significance of the Study

This research study is expected to fill some gap by concentrating on design of work systems and attempting to single out the determinants of job designs and work measurements. It can give insights on the overall structure and procedure of the various tasks employees carry out on their job.

This study also can provide possible recommendations that are believed to be remedies to the unfavorable conditions and problems that constrain future possible improvements. The study may also add up its contribution to the existing knowledge in study area.

Scope and Limitations of the Study

Even though there are various subject matters that are covered under operations management, this particular study invested its full attention on the issue of design of work systems; job design and work measurement specifically. It tried to learn more toward the matters which are related to working conditions (safety, occupational health care, work time and work breaks, etc) that have significant impact on worker performance in terms of productivity, quality of output and accidents.

Given the time and resource constraints and specified scope, this endeavor was intended to be neither exhaustive nor fully comprehensive but a modest step in exploring the structures of jobs people perform. Although discussing the performance of more than one company would make the findings more fruitful, the data presented in this study were only for one manufacturing company.

Organization of the Study

The study is made up of four comprehensive chapters. The first chapter consists of the introduction along with statement of the problem, research objectives, research questions, methodologies and research design, and finally significance and scope of the study. The review of literature and findings of related researches are presented in chapter two. Background of the study area together with data analysis and interpretation are dealt with in chapter three. The fourth and final chapter tries to wind up the study by providing concluding remarks and recommendations.

Literature Review

Introduction

Two basic developments have characterized organizations in modern industrialized societies. First and most significant was scientific management's focus on the logic of the production process, particularly people and machines at work on a job. This follow-up of Adam Smith's concept of labor specialization has led to establishment of logical approaches to job design, individual and group standards for performance, and techniques for measurement of work. A good bit of the development in industrial engineering over the last century has been devoted to this rational, scientific, logical approach to job analysis (Adam and Ebert 1982, p.299).

In job design, methods analysis is used to establish the general work flow in the facility. Once the general work flow has been established, specific jobs can be detailed. After the jobs have been designed, a standard needs to be established to ensure that the jobs are being performed properly. Establishing a standard, however, requires an understanding of work measurement. It is emphasized that work measurement follows method analysis. Only after we have established the proper method for getting the job done (job design) can

we be concerned about measuring it (setting the standard through measurement). Obviously, setting a standard for an existing job and then redesigning it constitutes wasted effort. Following is a thorough discussion of these three related area with the one that comes first, job design (Ibid, p.299).

Job Design

In production and operations, job design follows the planning and designing of product, process and equipment. Job design specifies the content of each job and determines the distribution of work within the organization. Just as an architect can build (design) a house in many different ways with many different materials, so can a manager build (design) a job with many different parts (elements). A combination of creativity and adherence to basic goals is critical to both the architect and the manager (Adam and Ebert 1982, p.299).

Job Design Defined

Job Design involves specifying the content, methods and relationships of jobs to satisfy technological and organizational requirements as well as the personal needs of job holders. Job designers focus on *what* will be done in a job, *which* will do the job, *how* will the job be done, and *where* the job will be done. The objectives of job design include productivity, safety, and quality of work life (Stevenson 2009, p.327).

Chase and Aquilano (pp.328-29) define *job design* as the function of specifying the work activities of an individual or group in an organizational setting. Its objective is to develop work assignments that meet the

requirements of the organization and the technology and that satisfy the jobholder's personal and individual requirements.

> Job design is a complex function because of the variety of factors that enter into arriving at the ultimate job structure. Decisions must be made as to who is to perform the job, where it is to be performed, and how it is to be performed. And each of these factors may have additional considerations (Ibid, p. 329).

Current practice in job design, according to Stevenson (pp.327-28), contains elements of two basic schools of thought. One might be called the efficiency school because it emphasizes a systematic, logical approach to job design; the other is called the behavioral school because it emphasizes satisfaction of wants and needs.

Specialization

The term specialization refers to work that concentrates on some aspect of a product or service; it describes jobs that have a very narrow scope. The main rationale for specialization is the ability to concentrate one's effort and thereby become proficient at that type of work. The advantage of highly specialized jobs is that they yield high productivity and relatively low unit costs, and they are largely responsible for the high standard of living that exists today in industrialized nations (Stevenson 2009, p.328).

Specialization of labor is the two-edged sword of job design. On one hand, specialization has made possible high-speed, low-cost production, and from a materialistic standpoint, it has greatly enhanced our standard of living. On the other hand, extreme specialization often has serious adverse effects on workers, which in turn are passed on to management. In essence, the

problem is to determine how much specialization is enough. At what point do the disadvantages outweigh the advantages? (Chase and Aquilano 1981, p.329)

Recent research suggests that the disadvantages dominate the advantages much more commonly than was thought in the past. However, simply stating that for purely humanitarian reasons, specialization should be avoided is a risky assertion. The reason, of course, is that people differ in what they want from their work and what they are willing to put into it. Some workers prefer not to make decisions about their work, some like to daydream on the job, and others are simply not capable of performing more complex work. The seriousness of these problems caused job designers and others to seek ways of alleviating them. To improve the quality of jobs, leading researchers and thoughtful businessmen try different approaches to job design. Some of those approaches are discussed in the following sections (Ibid, pp.329-30).

Behavioral Approaches to Job Design

Behavior school is relatively a new concept and focused on ways to eliminate workers dissatisfaction and incorporate the feeling of control in work. In an effort to make jobs more interesting and meaningful, job designers frequently consider job enlargement, job rotation, job enrichment, and increased use of mechanization (Stevenson 2009, p.328).

Job Enlargement means giving a worker a larger portion of the total task. This constitutes horizontal loading—the additional worker is on the same level of skill and responsibility as the original job. The goal is to make the job more interesting by increasing the variety of skills required and by

providing the worker with a more recognizable contribution to the overall output.

Job Rotation means having workers periodically exchange jobs. A firm can use this approach to avoid having one or a few employees stuck in monotonous jobs. It works best when workers can be transferred to more interesting jobs; there is little advantage in having workers exchange one boring job for another. Job rotation allows workers to broaden their learning experience and enables them to fill in for others in the event of sickness or absenteeism.

Job Enrichment involves an increase in the responsibility for planning and coordination tasks. It is sometimes referred to as vertical loading. A job is said to be enlarged *horizontally* if the worker performs a greater number or variety of tasks, and it is said to be enlarged *vertically* if the worker is involved in planning, organizing, and inspecting his or her own work. The job enrichment process focuses on the motivating potential of worker satisfaction.

The importance of these approaches to job design is that they have the potential to increase the motivational power of jobs by increasing worker satisfaction through improvement in the quality of work life. According to Stevenson (p.329), many firms are currently involved in or seriously considering programs related to quality of work life.

Physical Considerations in Job Design

Beyond the behavioral aspects of job design, another aspect of the topic warrants consideration, namely, the physical side. Indeed, while motivation and work-group structure strongly influence worker performance, they may

be of secondary importance if the job is too demanding or is otherwise ill-designed from a physical standpoint. The following section examines the physical side of work in terms of its demand on the individual (Chase and Aquilano 1981, pp.332-33).

Work Physiology

Work physiology is essentially the application of physiological techniques to manual work. The techniques are predicated on the assumption that certain physiological changes take place during work and that, by observing these changes, the level of physical stress can be determined. Unlike traditional industrial engineering practice, where performance time is the criterion of work intensity, work physiology attempts to determine directly, and is expressed by physiological indices, the true fatigue engendered by the work (Ibid, p. 336).

Ergonomics

"Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance. Ergonomists contribute to the design and evaluation of tasks, jobs, products, environments and systems in order to make them compatible with the needs, abilities and limitations of peoples. In the work environment, ergonomics also helps to increase productivity by reducing worker discomfort and fatigue (Stevenson 2009, pp.330-31).

Methods Analysis

One of the techniques used by self-directed teams and work analysts is ***methods analysis***, which focuses on how a job is done. Job design often begins with analysis of the overall operation. It then moves from general to specific details of the job, concentrating on arrangement of the work place and movements of material and/or workers. Methods analysis can be a good source of productivity improvements (Stevenson 2009, p.332).

Ordinarily, the objective of improving work methods is to increase productivity by increasing the production capacity of an operation or group of operations, reducing the cost of the operation, or improving product quality. One key to successful methods analysis is the development of a questioning attitude about every facet of the job being studied. Is every part of the job necessary? Why is it done that way? Who could do it better? Questions such as these ensure that analysts accept nothing in an operation as sacred; everything about the job will be meticulously scrutinized. When this questioning attitude is combined with the principles of motion economy, analysts can develop improved work methods (Gaither 1996, p.617).

The basic procedure in methods analysis, according to Stevenson (2009, pp.332-36), is as follows:

1. Identify the operation to be studied, and gather all pertinent facts about tools, equipment, materials, and so on.
2. For existing jobs, discuss the job with the operator and supervisor to get their input.
3. Study and document the present method of an existing job using process charts. For new jobs, develop charts based on information about the activities involved.
4. Analyze the job.

5. Propose new methods.
6. Install the new methods.
7. Follow up implementation to assure that improvements have been achieved.

Motion Study

Motion study is the systematic study of the human motions used to perform an operation. The purpose is to eliminate unnecessary motions and to identify the best sequence of motions for maximum efficiency. Hence, motion study can be an important avenue for productivity improvements. Present practice evolved from the work of Frank Gilbreth, who originated the concepts in the bricklaying trade in the early 20th century. (Stevenson 2009, pp.336-38)

There are a number of different techniques that motion study analysts can use to develop efficient procedures. The most-used techniques are the following:

1. Motion study principles.
2. Analysis of therbligs.
3. Micro motion study.
4. Charts.

2.4. Work Measurement

"When you can measure it, you know something about it."—Lord Kelvin (As cited in Chase and Aquilano 1981, p.345)

What units of measurement shall be used to measure human work? Foot-pounds, calories per minute and other units have been used in the physical sciences to measure work. But in operations, a unit of work that is both easily measured and easily understood must be used. The unit of measure that has evolved is worker-minutes per unit of output. In other words, how many minutes does it ordinarily take a well-trained worker, on the average, to produce one component, subassembly, product or service? (Gaither 1996, pp.622-23)

According to Gaither (pp.623), *work measurement* refers to the process of estimating the amount of worker time required to generate one unit of output. The ultimate goal of work measurement is usually to develop labor standards that will be used for planning and controlling operations, thereby achieving high labor productivity.

Work Measurement is concerned with determining the length of time it should take to complete the job. Job times are vital inputs for capacity planning, workforce planning, estimating labor costs, and scheduling, budgeting, and designing incentive systems. Moreover, from the workers' standpoint, time standards reflect the amount of time it should take to a given job working under typical conditions. The standards include expected activity time plus allowances for probable delays. (Stevenson 2009, p.339)

Purpose of Work Measurement

Method study is the principal technique for reducing the work involved, primarily by eliminating unnecessary movement on the part of material or operatives and by substituting good methods for poor ones. Work measurement is concerned with investigating, reducing and subsequently

eliminating ineffective time, that is time during which no effective work is being performed, whatever the cause (www.sec.ed.ac.uk)

The fundamental purpose of work measurement is to set time standards for a job. Such standards are necessary for four reasons:

1. To schedule work and allocate capacity. All scheduling approaches require some estimate of how much time it takes to do the work being scheduled.

2. To provide an objective basis for motivating the workforce and measuring workers' performance. Measured standards are particularly critical where output-based incentive plans are employed.

3. To bid for new contracts and to evaluate performance on existing ones. Questions such as "Can we do it?" and "How are we doing?" presume the existence of standards.

5. ***To provide benchmarks for improvement.*** In addition to internal evaluation, benchmarking teams regularly compare work standards in their company with those of similar jobs in other organizations.

Work Measurement Techniques

Organizations develop time standards in a number of different ways. Although some small manufacturers and service organizations rely on subjective estimates of job times, the most commonly used methods of work measurement are (1*) stopwatch time study,* (2*) historical times*, (3) *predetermined data*, and (4) *work sampling*. The following parts describe each of these techniques in some detail (Stevenson 2009, p.339)

Stopwatch Time Study

Stopwatch time study was formally introduced by Frederick Winslow Taylor in the 19th century. Today, it is the most widely used method of work measurement. It is especially appropriate for short and repetitive tasks.

Stopwatch time study is used to develop a time standard based on observations of one worker taken over a number of cycles. That is then applied to the work of all others in the organization who perform the same task. The basic steps in a time study are the following:

1. Define the task to be studied, and inform the worker who will be studied.
2. Determine the number of cycles to be observed.
3. Time the job, and rate the worker's performance.
4. Compute the standard time. (Ibid, p. 339)

The analyst who studies the job should be thoroughly familiar with it since it is not unusual for workers to attempt to include extra motions during the study in hope of gaining a standard that allows more time per piece i.e., the worker will be able to work at a slower pace and still meet the standard. Furthermore, the analyst will need to check that the job is being performed efficiently before setting the time standard.

Development of a standard time involves computation of three times: the *observed time* (OT), the *normal time* (NT), and the *standard time* (ST). (Ibid, pp.341-44)

Observed Time- The observed time is simply the average of the recorded times.

Normal Tim- The normal time is the observed time adjusted for worker performance. It is computed by multiplying the observed time by a *performance rating*.

Standard Time- The normal does not take into account such factors as personal delays (getting a drink of water or going to the restroom), unavoidable delays (machine adjustments and repairs, talking to a supervisor, waiting for materials), or rest breaks. The standard time for a job is the normal time multiplied by an *allowance factor* for these days.

Standard Elemental Times

Standard elemental times are derived from a firm's own historical time study data. Over the years, a time study department can accumulate a file of elemental times that are common to many jobs. After a while, many elemental times can be simply retrieved from the file, eliminating the need for analysts to go through a complete time study to obtain them. (Stevenson, 2009, p. 344)

The procedure for using standard elemental times consists of the following steps:

1. Analyze the job to identify the standard elements.
2. Check the file for elements that have historical times, and record them. Use time study to obtain others, if necessary.
3. Modify the file times, if necessary.
4. Sum the elemental times to obtain the normal time, and factor in allowances to obtain the standard time.

One obvious advantage of this approach is the potential savings in cost and effort created by not having to conduct a complete time study for each job. A second advantage is that there is less disruption of work, again because the analyst does not have to time the worker. A third advantage is that performance ratings do not have to be done; they are generally averaged in the file times. The main disadvantage of this approach is that times may not exist for enough standard elements to make it worthwhile, and the file times may be biased or inaccurate.

Predetermined Time Standards

When labor standards must be determined in advance of performing an operation, **predetermined time standards** can be used. These standards utilize data that have been historically developed for basic body movements, elements of operations, and entire operations. When cost estimates or pricing information is required for new operations or new products, these standards are commonly used. (Gaither 1996, p.628)

Many predetermined time standard systems are used today—work factor, methods time measurement (MTM), basic motion time (BMT) study, and a host of systems custom designed for individual companies. (Ibid, p. 628)

A high level of skill is required to generate a predetermined time standard. Analysts generally take training or certification courses to develop the necessary skills to do this kind of work.

Work Sampling

Work sampling is a technique for estimating the proportion of time that a worker or a machine spends on various activities and the idle time. As the

name suggests, work sampling involves observing a portion or sample of the work activity. Then, based on the findings in this sample, statements can be made about the activity. Unlike time study, work sampling does not require timing an activity, nor does it even involve continuous observation of the activity. Instead, an observer makes brief observations of a worker or machine at random intervals and simply note the nature of the activity. (Stevenson 2009, p.346)

Work sampling is a work measurement technique that randomly samples the work of one or more employees at periodic intervals to determine the proportion of the total operation that is accounted for in one particular activity. These studies are frequently used to estimate the percentage of employee' time spent in such activities as these: unavoidable delays, which are commonly called ratio-delay studies; repairing finished products from an operation; or supplying material to an operation. The results of these studies are commonly used to set allowances used in computing labor standards, in estimating costs of certain activities, and in investigating work methods. (Gaither 1006, p.626)

According to Chase and Aquilano (p.353), the five steps that are involved in making a work sampling study include:

1. Identify the specific activity or activities that are the main purpose for the study.
2. Estimate the proportion of time of the activity of interest to the total time. These estimates can be made from the analyst's knowledge, past data, reliable guesses from others, or a pilot work sampling study.

3. State the desired accuracy in the study results.
4. Determine the specific times when each observation is to be made.
5. At two or three intervals during the study period, recomputed the required sample size by using the data collected thus far. Adjust the number of observations if appropriate.

Quality of Work Life

In recent years the issue of designing jobs has gone beyond the determination of the most efficient way to perform tasks. The quality of work life (QWL) has become an important design ingredient, and the concept is now widely used to refer to "a philosophy of management that enhances the dignity of all workers, introduces changes in an organization, and improves the physical and emotional well-being of employees (e.g., providing opportunities for growth and development)." In some organizations QWL programs are intended to increase employee trust, involvement, and problem solving so as to increase both worker satisfaction and organizational effectiveness. (Ivancevich and Matteson 1990, pp.470-71)

People work for a variety of reasons. Generally people work to earn a living. Also they may be seeking self-realization, status, physical and mental stimulation, and socialization. Quality of work life affects not only workers' overall sense of well being and commitment, but also worker productivity. Quality of work life has several key aspects. Getting along well with co-workers and having good managers can contribute greatly to the quality of work life. Also important are working conditions and compensation, which are addressed here. (Stevenson 2009, p.322)

Working Conditions

Working conditions are an important aspect of job design. Physical factors such as temperature, humidity, ventilation, illumination, and noise can have a significant impact on worker performance in terms of productivity, quality of output, and accidents. In many aspects government regulations apply. (Ibid, pp.322-24)

Temperature and Humidity- Although human beings can function under a fairly wide range of temperatures and humidity, work performance tends to be adversely affected if temperatures or humidity are outside a very narrow comfort band. That comfort band depends on how strenuous the work is; the more strenuous the work, the lower the comfort range.

Ventilation-Unpleasant and noxious odors can be distracting and dangerous to workers. Moreover, unless smoke and dust are periodically removed, the air can quickly become stale and annoying.

Illumination- The amount of illumination required depends largely on the type of work being performed; the more detailed the work, the higher the level of illumination needed for adequate performance. Other important considerations are the amount of glare and contrast. From a safety standpoint, good lighting in halls, stairways, and other dangerous points is important. However, because illumination is expensive, high illumination in all areas is not generally desirable.

Noise and Vibrations- Noise is unwanted sound. It is caused by both equipment and humans. Noise can be annoying or distracting, leading to errors and accidents. Vibrations can be a factor in job design even without a noise component, so merely eliminating sound may not be sufficient in every case. Vibrations can come from tools, machines, vehicles, human activity, air-conditioning systems, pumps and other sources.

Work, Time and Work Breaks- Reasonable (and sometimes flexible) work hours can provide a sense of freedom and control over one's work. This is useful in situations where emphasis is on completing work on a timely basis. Work breaks are also important. Long work intervals tend to generate boredom and fatigue. Productivity and quality can both deteriorate.

Occupational Health Care- Good worker health contributes to productivity, minimizes health care costs, and enhances workers' sense of well being. Many organizations have exercise and healthy-eating programs designed to improve or maintain employees' fitness and general health.

Safety- Worker safety is one of the most basic issues in job design. This area needs constant attention from management, employees, and designers. Workers cannot be effectively motivated if they feel they are in physical danger.

The enactment of the Occupational Safety and Health Act in 1970, and the creation of the Occupational Safety and Health Administration (OSHA), emphasized the importance of safety considerations in systems design. The law was intended to ensure that workers in all organizations have healthy and safe working conditions. It provides specific safety regulations with inspectors to see that they are adhered to. Inspections are carried out both at random and to investigate complaints of unsafe conditions. OSHA officials are empowered to issue warnings, to impose fines, and even to invoke court-ordered shutdowns for unsafe conditions.

Compensation

Compensation is a significant issue for the design of work systems. It is important for organizations to develop suitable compensation plans for their

employees. If wages are too low, organizations may find it difficult to attract and hold competent workers and managers. If wages are too high, the increased costs may result in lower profits, or may force the organization to increase its prices, which might adversely affect demand for the organization's products or services. (Stevenson 2009, p. 324)

Organizations use a variety of approaches to compensate employees, including time-based systems, output-based systems, incentive systems, and knowledge-based systems. **Time-based systems**, also known as hourly and measured day work systems, compensate employees for the time the employee has worked during a pay period. Salaried workers also represent a form of time-based compensation. **Output-based (incentive) systems** compensate employees according to the amount of output they produce during a pay period, thereby tying pay directly to performance.

Time-based systems are more widely used than incentive systems, particularly for office, administrative, and managerial employees, but also for blue-collar workers. One reason for this is that computation of wages is straightforward and managers can readily estimate labor costs for a given employee level.

Another reason for using time-based systems is that many jobs do not lend themselves to the use of incentives. In some cases, it may be difficult or impossible to measure output. For example, jobs that require creative or mental work cannot be easily measured on an output basis. Other jobs may include irregular activities or have so many different forms of output that measuring output and determining pay are fairly complex. (Ibid, pp.324-25)

On the other hand, situations exist where incentives are desirable. Incentives reward workers for their output, presumably causing some workers to

produce more than they might under a time-based system. The advantage is that certain (fixed) do not vary with increase in output, so the overall cost per unit decreased if output increases. Workers may prefer incentive systems because they see a relationship between their efforts and their pay. An incentive system presents an opportunity for them to earn more money.

Individual Incentive Plans- Individual incentive plans take a variety of forms. The simplest plan is *straight piecework*. Under this plan, a worker's pay is a direct linear function of his or her output. In the past, piecework plans were fairly popular. Now minimum wage legislation makes them somewhat impractical. Even so, many of the plans currently in use represent variations of the straight piecework plan. They typically incorporate a base rate that serves as a floor: workers are guaranteed that amount as a minimum, regardless of output. The base rate is tied to an output standard; a worker who produces less than the standard will be paid at the base rate. This protects workers from pay loss due to delays, breakdowns, and similar problems. In most cases, incentives are paid for output above standard, and the pay is referred to as a *bonus.*

Group Incentive Plans. A variety of group incentive plans, which stress sharing of productive gains with employees, are in use. Some focus exclusively on output, while others reward employees for output and for reductions in material and other costs.

One form of the group incentive is the *team approach*, which many companies are now using for problem solving and continuous improvement. The emphasis is on the team, not individual performance.

Knowledge-Based Pay Systems- As companies shift towards lean production, a number of changes have had a direct impact on the work environment. One is that many of the buffers that previously existed are gone. Another is that fewer managers are present. Still another is increased emphasis on quality, productivity and flexibility. Consequently, workers who can perform a variety of tasks are particularly valuable. Organizations are increasingly recognizing this, and they are setting up pay systems to reward workers who undergo training that increase their skill levels. This is sometimes referred to as knowledge-based pay. It is a portion of a worker's pay that is based on the knowledge and skill that the worker possesses. Knowledge-based pay has three dimensions: *Horizontal skills* reflect the variety of tasks the worker is capable of performing; *vertical skills* reflect managerial tasks the worker is capable of; and *depth skills* reflect quality and productivity results.

Data Analysis and Interpretation

Background of REPI Soap and Detergent S. Co

REPI Soap and detergent S. Co. formally known as REPI Soap Factory was established in 1974 by the name Bianil Ethiopia Share Company by foreign investors of Swiss and Greek origin aiming to produce and distribute powder detergent to the East African market which was dominated by a Uniliver brand OMO.

The Share Company's ownership was transferred the following year and its management fell under the National Chemical Corporation. It was then re-established as a publicly owned enterprise in 1992. The authorized capital at the time re-establishment was Birr 1,525,000.00.

The Share Company started business by manufacturing powder detergent. Detergent bar soap and liquid detergents were added into its product lines in 1979 and 1994, respectively. After some expansion and face lifting jobs, the annual three thousand tons of output in 2007 has quadrupled into twelve thousand tons in 2011.

REPI Soap Factory manufactures detergents for all purpose cleaning and industrial grade detergents for packing line machines for food processing, beverages and the construction industry.

With over 35 years for experience in detergent manufacturing, REPI has earned the trust of an increasing number of households and institutions. All detergent products from REPI Soap and Detergent S.C help customer's cleaning services to stand out.

Vision/Mission of REPI

The vision of REPI Soap and Detergent S.C is to become competitive detergent products manufacturer by providing quality products for its customers. Its mission is to create value for its customers and stake holders by upgrading the technology to manufacture out products efficiently.

The company's main vision was to compete against local and imported powder detergent through its famous brand 'ROL'. Due to the machinery's age and technological issues, there was an issue of wastage which nearly bankrupted the company but thanks to a pioneering idea of creating a detergent bar (Cake) in 1979, REPI gave birth to a new line of product and a new brand 'AJAX'. Production of a liquid detergent was then introduced in 1994 under the brand name "LARGO'.

Products

The main products that REPI is currently producing include the following powder products: liquid and solid products.

A. Powder Products

Powder products constitute the main product line of all the types of the product produced. This product line includes such item as: Rol which is available in 30gm, 50gm, 200gm, 100gm, 1kg, and 10kg; Maya Auto Wash available in 1.8kg, 3kg and 20kg and Maya Hand Wash available in 50gm and 200gm. A third powder product is Essex, a low foam product available in 20kg and also in 40kg.

B. Liquid Products

Liquid products make up another product line. Liquid products include Largo-Multipurpose liquid detergent available in 1-6kg and Largo Industrial liquid detergent, Maya Dish Wash available in 500ml and Maya Glass Cleaner available also available in 500ml.

C. Solid Products

Bar soaps also constitute a major product line. The main solid products that REPI produces are Ajax Bar Detergents in 100gm and 200gm and Inno Laundry Soap in 200gm.

Figure 1: Organizational Structure of **REPI** *Soap and Detergent S.CO.*

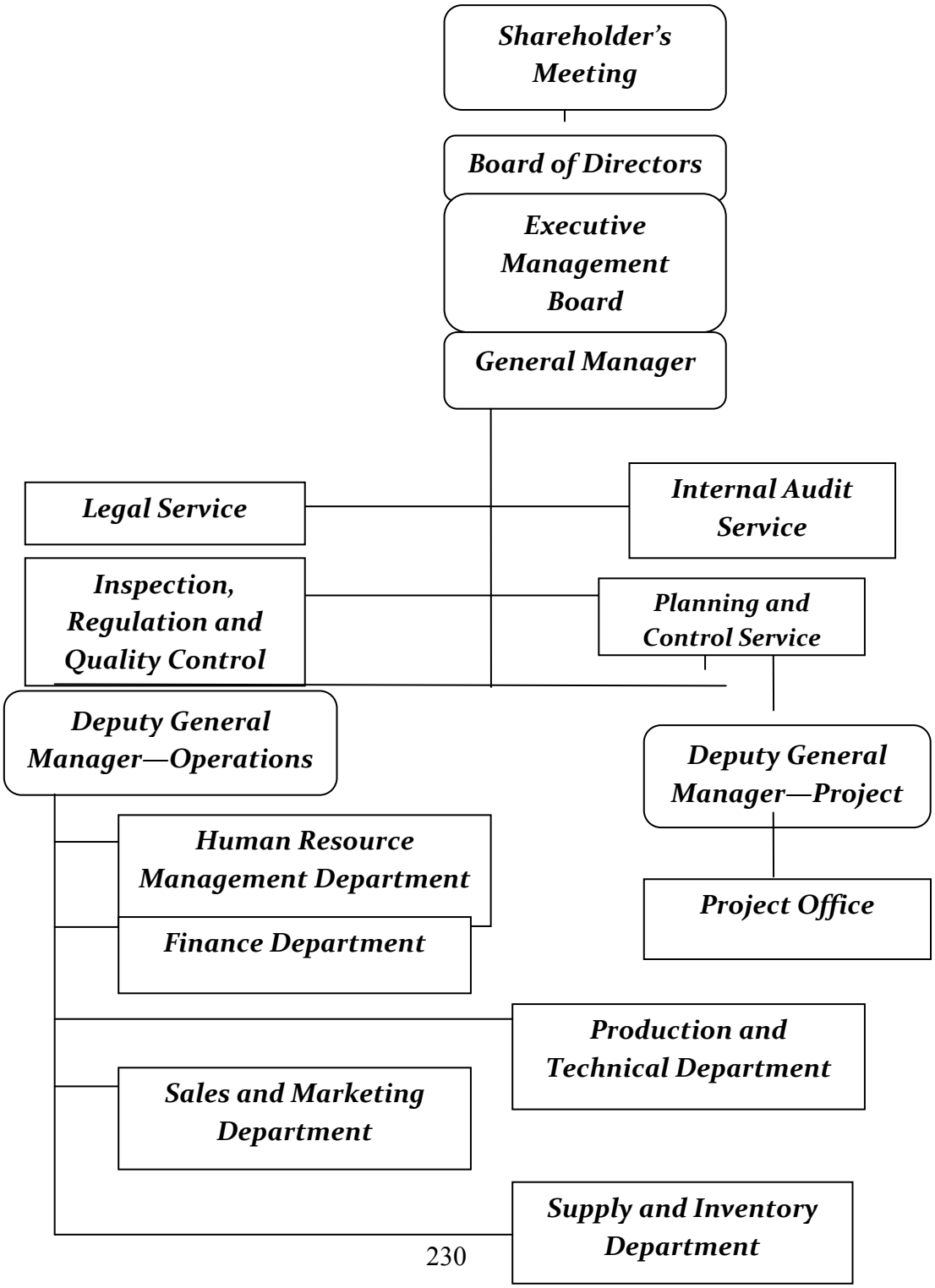
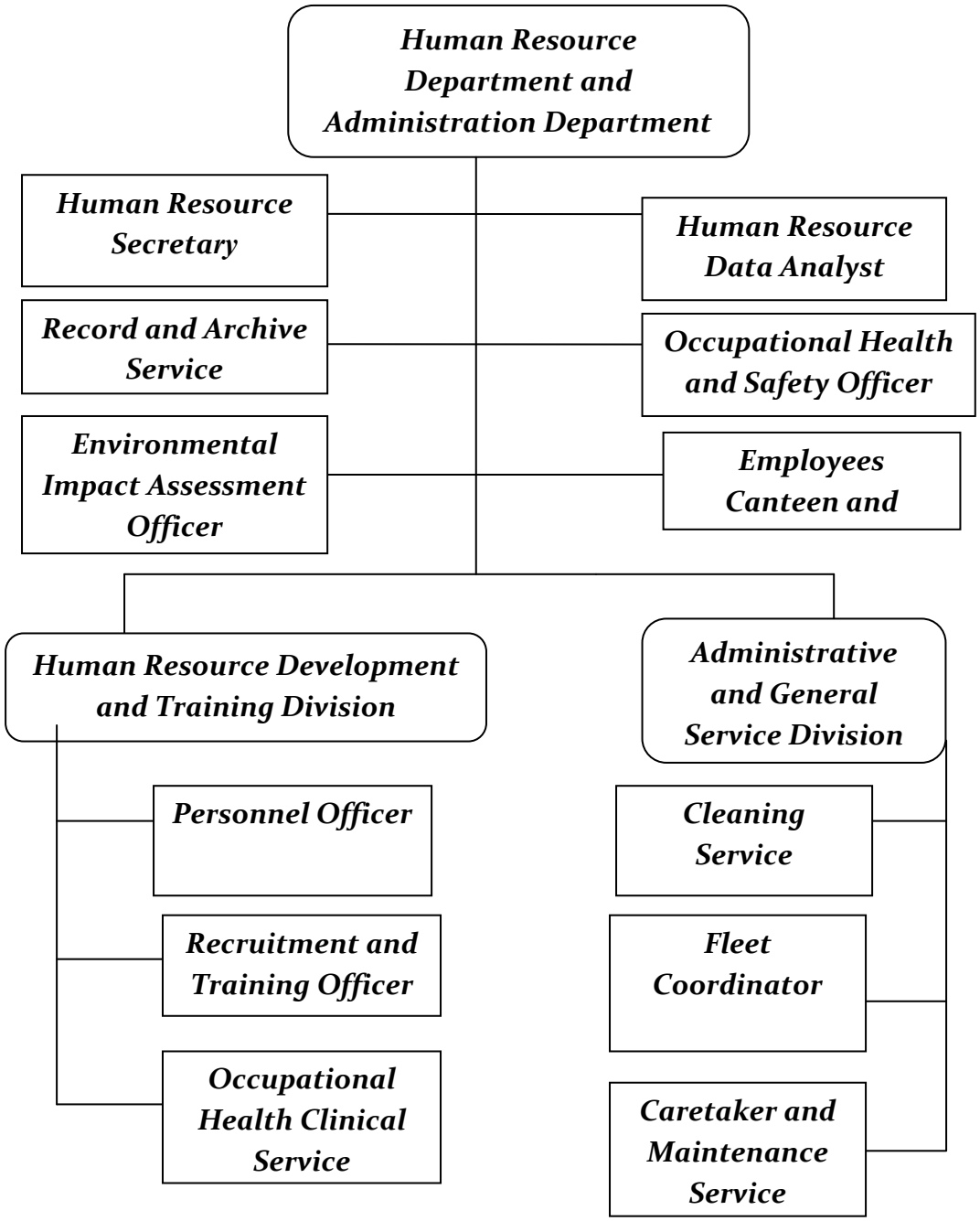


Figure 2: Position in the Organization/Reporting Structure



1.2. Presentation of Data Analysis and Interpretation

This part of the chapter contains the analysis and interpretation of the results obtained from the questionnaires that were distributed and filled by the employees currently working at REPI. 60 questionnaires were distributed among which 44 were returned with the necessary responses. The sampling technique applied to this study is stratified sampling techniques out of which gender has been used as the strata. Male employees make up 62.7% of the total population, whereas female employees make up approximately 37.3%. These percentages are applied to the sample size of 60 and as a result 38 of the questionnaires were given to male employees while the rest, 22, were distributed to females.

Currently, there are a total of 466 employees, 292 male and 174 female workers, employed at REPI. These employees include those working on a full-time basis, part-time basis and those working on special contracts.

The employees were requested to share their views of different aspects of their job by using different types of rating scales. The production department was also interviewed regarding the issues of the jobs performed, the environment in which these jobs are performed and the methods of compensation used for these jobs.

Personal Profile of Respondents

The employees to whom the questionnaire was given consist of individuals from diverse backgrounds. They come from different age groups, gender, marital status, educational backgrounds, and job levels. These respondents

have serviced the company for different years and as such have varying salaries paid to them.

As mentioned earlier, the majority of the questionnaires were distributed to male respondents. Out of the total respondents, 63.6% turned out to be male and the remaining 36.4% were female. As indicated in Table 1, more than half of these respondents are below the age of 30, which denotes that the dominant workforce is made up of youngsters. Regarding their marital status, most are unmarried while some have a family.

Table 1: Personal Profile of the Respondents

Description	No. of Respondents	Percentage
GENDER		
Male	28	63.6
Female	16	36.4
Total	**44**	**100**
AGE		
Under 25	16	36.4
26—30	13	29.5
31—35	8	18.2
36—40	3	6.8
41—45	3	6.8
Above 45	1	2.3
Total	**44**	**100**
MARITAL STATUS		
Single	28	63.6
Married	13	29.5
Widowed	1	2.3
Divorced	2	4.5
Total	**44**	**100**

EDUCATIONAL BACKGROUND		
Technical and Vocational Diploma	15	34.1
College Diploma	8	18.2
1st Degree	11	25
2nd Degree and Above	-	-
Other	10	22.7
Total	**44**	**100**
JOB LEVEL		
Top	-	-
Middle	25	56.8
Supervisor	7	15.9
Other	12	27.3
Total	**44**	**100**
BASIC SALARY		
Less than 1200	17	38.6
1201—1500	3	6.8
1501—1800	13	29.5
1801—2100	3	6.8
More than 2100	8	18.2
Total	**44**	**100**
YEARS OF SERVICE		
Less than 5 years	34	77.3
6—10 years	4	9.1
11—15 years	2	4.5
Above 15 years	4	9.1
Total	**44**	**100**

34.1% of the respondents have technical and vocational diplomas and none seem to possess an educational level above a 1st degree. 10% claim to have

completed certain grade levels while one has a certificate in computer and language studies and another turned out to be a 3rd year university student. This indicates that many workers do not have an advanced educational status, and this shows that the greater parts of the jobs that are designed do not require special skills or competencies.

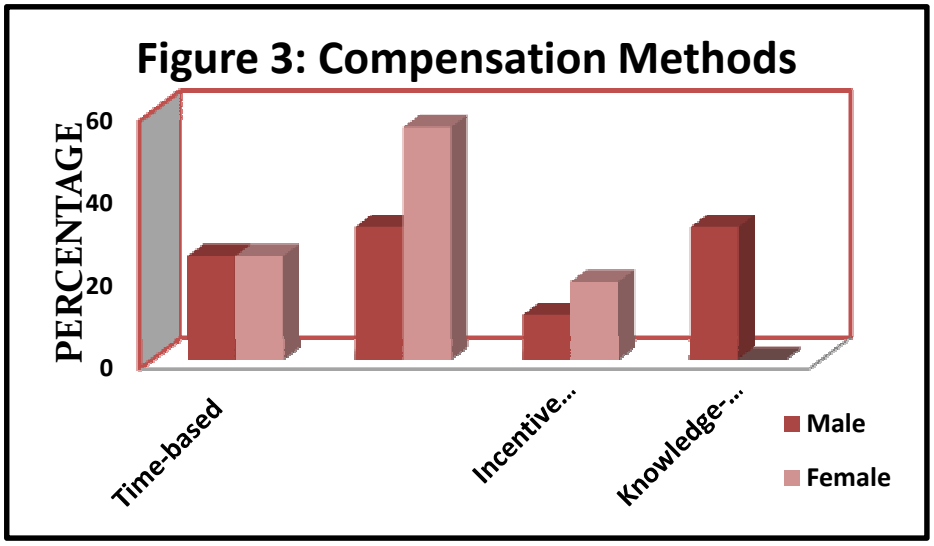
A quarter of the job level that is occupied is that of middle level with some having positions other than those mentioned. 12% of the respondents work mainly as production foremen and technicians. 38.6% have salaries of less than Birr 1200 while 18.2% are paid more than Birr 2100. This indicates that the company isn't paying very well. With regards to years of service, 3/4th of the respondents seem to have recently joined the company, while 1/4th have serviced the company for more than 5 years. This slightly shows that the organization doesn't properly try to retain all of its workers.

Compensation

Compensation is a significant issue for the design of work systems. It is important for organizations to develop suitable compensation plans for their employees. Regarding this, REPI uses a variety of compensation plans for its employees, out of which time-based and output-based systems are the most important ones. According to the interview with the production unit, output-based system tends to be in the forefront to the others. Despite this fact, the response of the employees has been carefully considered and is presented in the following Table.

Table 2: Compensation Situation

Description	No. of Respondents	Percentage
I AM COMPENSATED BASED ON		
Time-based system	11	25
Output-based system	18	40.9
Incentive system	6	13.6
Knowledge-based system	9	20.5
Total	**44**	**100**
ARE BONUSES EVER REWARDED?		
Yes	23	52.3
No	21	47.7
Total	**44**	**100**
IF YOUR ANSWER TO THE PREVIOUS QUESTION IS "YES", THEN HOW OFTEN ARE BONUSES REWARDED?		
Very often	7	30.4
Often	3	13
Seldom	3	13
Rarely	7	30.4
Never	3	13
Total	**23**	**100**
HAVE YOU EVER RECEIVED A BONUS?		
Yes	19	43.2
No	25	56.8
Total	**44**	**100**



The information obtained from the respondents seems to be consistent with that obtained from the interview. It shows that the majority, 40.9% to be exact, are indeed compensated based on how much output they produce. While 20.5%, on the other hand, are compensated on special knowledge or skill that they are in possession of.

From the responses acquired, workers usually tend to produce outputs above standards, and they are paid for in the form of bonuses. Those who claim that such bonuses are rewarded in the company have witnessed their distribution while equally; others seem not to have come across such distributions. Out of the 44 respondents, 25 (56.8%) of them have never received a bonus reward. The specific performances and reasons that lead 19 (43.2%) of the respondents to receive bonuses include the following:

- Performing above standard;
- Being more efficient and effective;
- As a result of the company's profitability;
- As a result of company laws regarding bonuses, and

- When the company satisfies its annual plans and objectives.

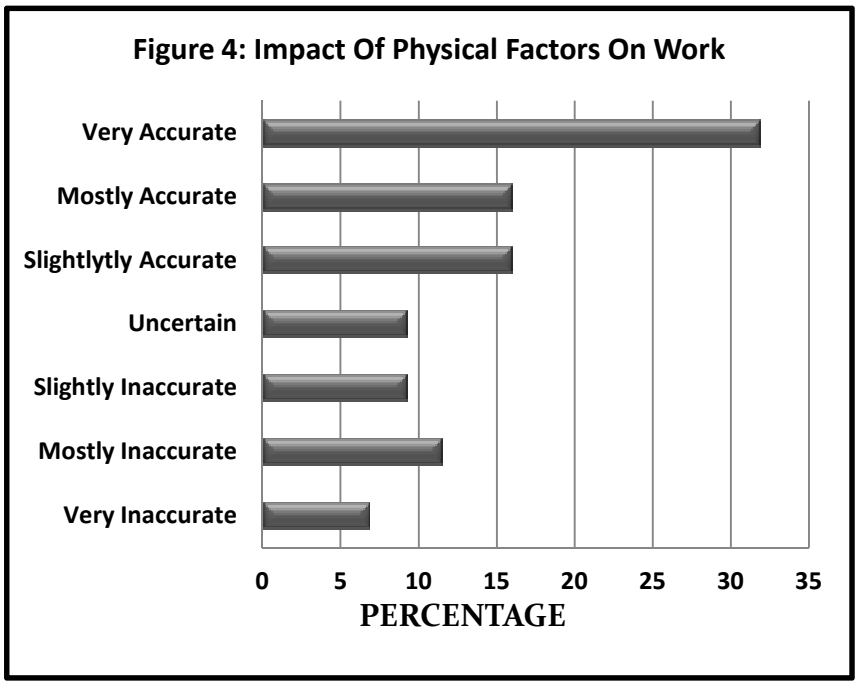
From information gathered during the interview, the annual plan of the company concerning compensation states that over production results in overpayment. Bonuses are dependent on work measurement and are usually distributed once every year. In addition, employees also work overtime and are compensated for it in a reasonable manner. One aspect of compensation that isn't highly encouraged is the group incentive plan. They believe that sharing of productive gains deteriorates the productivity of the workers. There is, however, one area in production that applies group incentive plans, but this, ultimately, tends to result in decreased quality as a result of high productivity.

Views on Working Conditions

Table 3: Views about General Working Conditions

Description	No. of Respondents	Percentage
1. Working conditions are given due consideration in every aspect of each job that is performed.		
Very Inaccurate	7	15.9
Mostly Inaccurate	2	4.5
Slightly Inaccurate	6	13.6
Uncertain	6	13.6
Slightly Accurate	8	18.2
Mostly Accurate	9	20.5
Very Accurate	6	13.6
Total	**44**	**100**
2. Physical factors have significant impact on the work I perform.		
Very Inaccurate	3	6.8
Mostly Inaccurate	5	11.4
Slightly Inaccurate	4	9.1
Uncertain	4	9.1
Slightly Accurate	7	15.9
Mostly Accurate	7	15.9
Very Accurate	14	31.8
Total	**44**	**100**

Working conditions are an important characteristic of job design. They could be considered as important aspects of productivity, quality of output, motivation, etc. It is vital, therefore, for organizations to take into consideration the main aspects of working conditions. Table 3 shows the responses given by the employees concerning their views on the impact that working conditions have on their individual jobs. They were asked to describe their jobs and indicate whether each statement is an accurate or inaccurate description of the conditions of their jobs. A detailed description of the results is presented in the sections to follow.



On the issue regarding the amount of consideration given to working conditions, 38.7% of the respondents claim that enough attention is given to

this area of their job while, on the opposite scale, 15.9% claim that this isn't true in their case. This analysis shows that not all the jobs that are designed in the company attract equal consideration from management on how well working conditions are incorporated with the design process.

On the other hand, as can be seen from the Table, more than half of the respondents have indicated that physical factors, mainly temperature, noise, humidity, illumination and ventilation, have considerable impact on their jobs in terms of productivity and quality of output. As gathered from the interview conducted, these physical factors are, to a large extent, taken into mind during job design, but the main factors given prior attention are temperature, humidity and noise. This indicates that the company exerts some effort towards maintaining or improving its employee's work life.

3. After working for long hours, I usually enjoy work breaks.		
Very Inaccurate	12	27.3
Mostly Inaccurate	4	9.1
Slightly Inaccurate	3	6.8
Uncertain	4	9.1
Slightly Accurate	11	25
Mostly Accurate	4	9.1
Very Accurate	6	13.6
Total	**44**	**100**

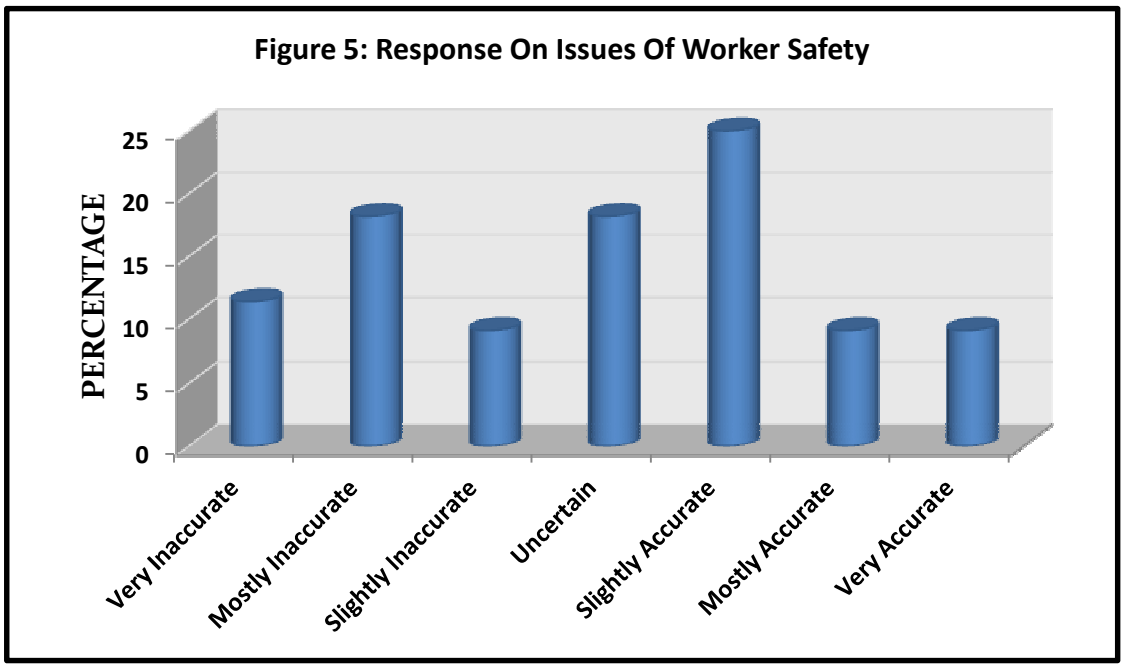
4. The hours that I spend on my job are reasonable and also flexible. Very Inaccurate Mostly Inaccurate Slightly Inaccurate Uncertain Slightly Accurate Mostly Accurate Very Accurate	 4 5 4 2 16 8 5	 9.1 11.4 9.1 4.5 36.4 18.2 11.4
Total	**44**	**100**

Out of the employees included in the sample, 36.4% of them rated "slightly accurate" to how flexible and reasonable the hours that they spend on their jobs are, while 29.6% said that this is very accurate and mostly accurate. This seems to be a good indicator, but unfortunately, not all jobs turned out to be as flexible and as reasonable as the others. 13 of the respondents said that they don't enjoy a sense of freedom and control over their work as a result. Regarding work breaks, there is approximately a 50/50 response that some enjoy work breaks while others don't. This indicates that the workers could be subject to boredom and fatigue, and this in turn could lead to a decrease in both productivity and quality. In another case, the workers seem to have a higher probability of completing work on a timely basis and meeting performance objectives.

5. The organization I work with has programs to improve or maintain employee's fitness and general health.		
Very Inaccurate	14	31.8
Mostly Inaccurate	1o	22.7
Slightly Inaccurate	6	13.6
Uncertain	4	9.1
Slightly Accurate	2	4.5
Mostly Accurate	6	13.6
Very Accurate	2	4.5
Total	**44**	**100**
6. Worker safety is an issue that receives constant attention from management.		
Very Inaccurate	5	11.4
Mostly Inaccurate	8	18.2
Slightly Inaccurate	4	9.1
Uncertain	8	18.2
Slightly Accurate	11	25
Mostly Accurate	4	9.1
Very Accurate	4	9.1
Total	**44**	**100**

With employee's general health being an issue in the workplace, 68.1% of the respondents said that the company doesn't have any health programs that help enhance their general wellbeing. However, the remaining respondents claim the company to have such programs. This controversy is settled by the fact that these programs refer to clinics or hospitals. According to the interview held with the production unit, there are clinics, both internal and external to the company, that help workers recover from injuries or illnesses like the common cold. First aid and other safety materials are also available.

But regarding fitness programs, there seem to be none in the company what so ever.



According to Table 3, 18.2% of the employees say that it is mostly inaccurate that worker safety receives considerable attention from management. However, 25% said that this is slightly true. This might indicate that some jobs incorporate safety issues in their design than most. According to the production unit leader, safety materials are used by the workers to overcome some adverse working conditions. These materials include protective gloves, goggles, safety shoes and overcoats used by the workers and dust collectors and air fresheners used inside the workplace. The employees, however, only use these materials when they believe they need it most in places where extremely necessary and tend to carry them

around in their pockets at less grave situations. This kind of negligence may possibly decrease their chances to avoid minor injuries.

7. The job that I perform constantly exposes me to accidents and illnesses. Very Inaccurate Mostly Inaccurate Slightly Inaccurate Uncertain Slightly Accurate Mostly Accurate Very Accurate	4 6 5 4 6 9 10	9.1 13.6 11.4 9.1 13.6 20.5 22.7
Total	**44**	**100**
8. Accidents that occur at the work place are mainly due to worker carelessness than to accident hazards. Very Inaccurate Mostly Inaccurate Slightly Inaccurate Uncertain Slightly Accurate Mostly Accurate Very Accurate	8 7 4 9 5 8 3	18.2 15.9 9.1 20.5 11.4 18.2 6.8
Total	**44**	**100**

From the total of 44 respondents of the questionnaire, 22.7% stated with absolute certainty that their job exposes them to accidents and illnesses. On the other extreme end, 9.1% of the respondents have jobs that are much less hazardous. More percentages of the jobs that are designed expose workers to physical danger. As such, 20.5% of the workers are indecisive as to causes of accidents either being to worker carelessness or to accident hazards. 43.2%

believed it is due to the latter while 36.4% pointed out it is mostly due to worker recklessness.

Contexts of Job Design

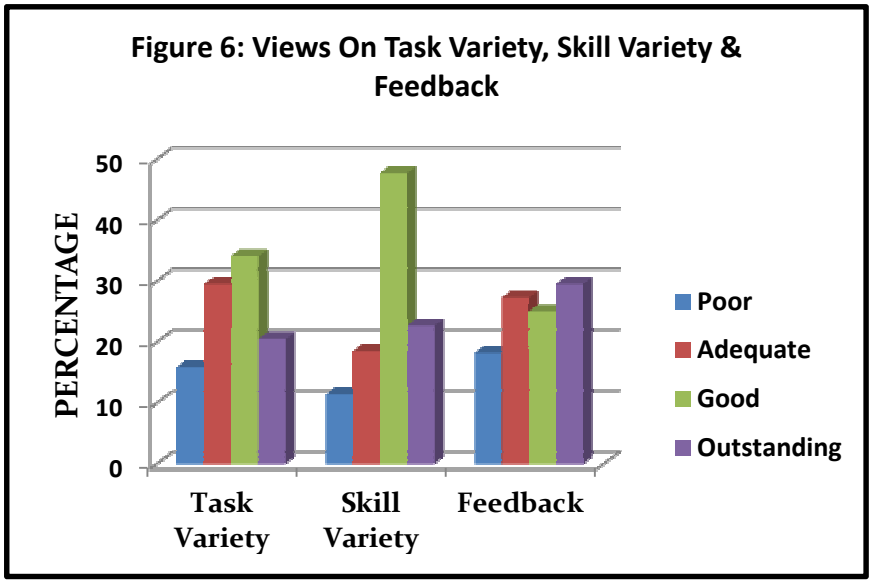
Following are various tables which include the different contexts under job design. Each table focuses on one characteristic. The respondents were asked to express their views by rating each characteristic. The result and interpretations of the findings proceed from here on.

Task Characteristics

Task characteristics include aspects of jobs like task variety, skill variety, feedback, task identity, etc. The views of all 44 respondents are presented in Table 4.

Table 4: Views on the Task Characteristics of Jobs

		Poor	Adequate	Good	Outstanding	**Total**
Task Variety	Frequency	7	13	15	9	**44**
	Percentage	15.9	29.5	34.1	20.5	**100**
Skill Variety	Frequency	5	8	21	10	**44**
	Percentage	11.4	18.2	47.7	22.7	**100**
Feedback	Frequency	8	12	11	13	**44**
	Percentage	18.2	27.3	25	29.5	**100**
Task Autonomy	Frequency	15	10	10	9	**44**
	Percentage	34.1	22.7	22.7	20.5	**100**
Task Identity	Frequency	6	13	13	12	**44**
	Percentage	13.6	29.5	29.5	27.3	**100**
Task Significance	Frequency	13	7	17	7	**44**
	Percentage	29.5	15.9	38.6	15.9	**100**



The overall task variety of the jobs that workers perform seems to be good. 20.5% of the respondents rated it as "Outstanding" while only 15.9% considered it to be poor. Consistent with this is skill variety where the majority of the workers view it as satisfactory. It can be inferred that many of the workers perform a wide range of activities, instead of only one or two, on their jobs and at the same time apply different skills to perform such activities successfully. Higher percentages (29.5%) of the workers claimed that they get information on their performance while 18.2% claimed they did not. This feedback allowed them to increase their effectiveness and correct any discrepancies in their performance.

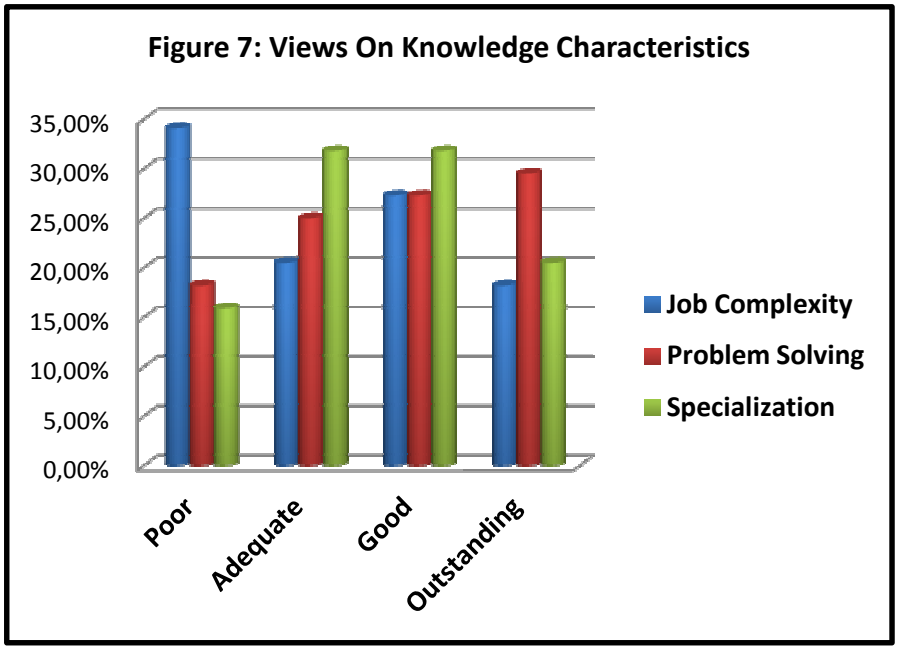
When it comes to the task autonomy, task identity and task significance, there seems to be a slight difference. Regarding task autonomy, a larger number of the respondents (34.1%) considered it poor, whereas a smaller number of them (20.5%) considered it outstanding. On the other hand, task identity and task significance were rated mainly as either adequate or good.

The interpretation is that the employees carry out almost the entire tasks in a job, and the job of one worker affects that of the other in terms of either slowing down or speeding up production. But in spite of this, workers fully comply with the previously established ways of how tasks are supposed to be executed.

Table 5 : Knowledge Characteristics

		Poor	Adequate	Good	Outstanding	**Total**
Job Complexity	Frequency	15	9	12	8	**44**
	Percentage	34.1	20.5	27.3	18.2	**100**
Information Processing	Frequency	9	10	16	9	**44**
	Percentage	20.5	22.7	36.4	20.5	**100**
Problem Solving	Frequency	8	11	12	13	**44**
	Percentage	18.2	25	27.3	29.5	**100**
Skill Variety	Frequency	5	14	16	9	**44**
	Percentage	11.4	31.8	36.4	20.5	**100**
Specialization	Frequency	7	14	14	9	**44**
	Percentage	15.9	31.8	31.8	20.5	**100**

According to the Table given below regarding knowledge characteristics, many of the jobs that the respondents perform don't seem to incorporate that much difficulty in them. In fact, 34.1% of the workers had less complex jobs whilst 18.2% performed their jobs with an increased difficulty. The tasks in the jobs appear to be less difficult to accomplish, yet they require certain information processing and cognitive problem solving techniques. About 50% of the respondents used an advanced level of data processing skills and also required possession of exceptional initiatives or solutions to problems.



As it has been previously mentioned, workers use varying skills to complete their works. This also applies to the skill variety aspect of the knowledge characteristic. Only small portions (11.4%) of the respondents did not need this variety of skills to finish their jobs which only indicates what has been said on the level of difficulty of the jobs being low. According to the interview conducted with the productions unit, specialization is one form of job design that is extensively applied to perform jobs in the organization. This information can certainly be backed up by what has been observed from the responses of the workers. 52.3% of the respondents indicated that they perform particular skills to a higher extent while only 15.9% of the workers did not need to exert such specialized skills. Specialization tends to be more useful for the company in light of cost reduction.

Contextual Characteristics

Table 6: Views on the Contextual Characteristics of Jobs

		Poor	Adequate	Good	Outstanding	**Total**
Ergonomics	Frequency	11	13	15	5	**44**
	Percentage	25	29.5	34.1	11.4	**100**
Physical Demands	Frequency	10	8	16	10	**44**
	Percentage	22.7	18.2	36.4	22.7	**100**
Work Conditions	Frequency	20	8	14	2	**44**
	Percentage	45.5	18.2	31.8	4.5	**100**
Equipment Use	Frequency	19	13	10	2	**44**
	Percentage	43.2	29.5	22.7	4.5	**100**
Motivation	Frequency	8	9	13	14	**44**
	Percentage	18.2	20.5	29.5	31.8	**100**

Moving on to the contextual characteristics of the many jobs designed, there seems to be an unexpected response concerning the issue of ergonomics to what has been observed. 34.1% of the workers said that their jobs allow them to incorporate proper posture and movement. However, 25% of them claimed that their jobs are not designed to be compatible with their needs, abilities and limitations. The levels of physical effort needed to perform tasks are substantially high in most jobs. This is shown by the fact that about 60% of the respondents stated that their jobs require strenuous efforts. This points out that the organization designs many of the jobs to be more demanding for its employees.

When it comes to the working conditions that exist in the company, it seems that the environment within which the workers perform their jobs was poor (45.5%) but also at the same time, considered fair (31.8%). This, as previously explained, confirms the existence of temperature and noise factors and also the presence of risks that expose workers to accidents. Despite this fact, the majority of the employees, 31.8%, pointed out that they are extremely motivated; 20.5% made clear that they are motivated to a reasonable level and only 18.2% did not consider their work to motivate them. The bonuses that the company rewards could be one reason for the amount of motivation experienced.

In addition to human effort, production is aided by the basic use of machinery and equipment. However, 43.2% of the workers seemed to rely mostly on their skill without the proper use of equipment. 29.5% employed equipment in their tasks to a compulsory degree and the remaining 27.2% executed their jobs by using the machineries to a higher extent. This means that half of the jobs in this company are labor-intensive while the other half are capital-intensive.

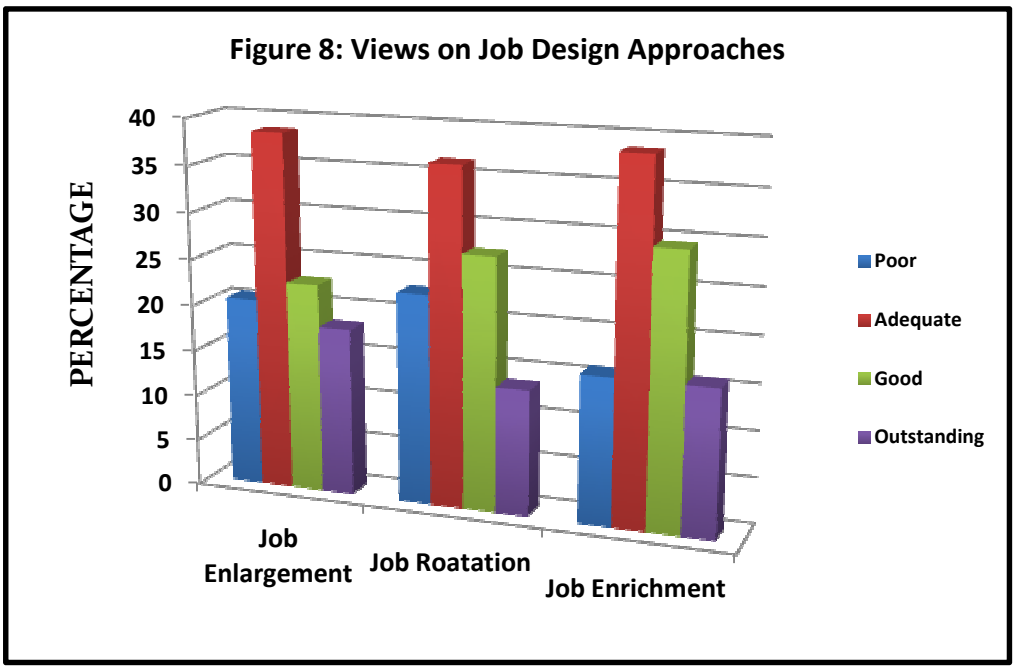
Job Design Approaches

According to the views of the respondents which are presented in table 3.7 below, 38.6%, 36.4% and 38.6% of the workers said that job enlargement, job rotation and job enrichment, respectively, are used to an essential degree in the company. But the approaches of job enlargement and rotation are a bit poor. However, it can be inferred that all three approaches are applied at one time or the other.

Table 7: Views on Job Design Approaches

		Poor	Adequate	Good	Outstanding	**Total**
Job Enlargement	Frequency	9	17	10	8	**44**
	Percentage	20.5	38.6	22.7	18.2	**100**
Job Rotation	Frequency	10	16	12	6	**44**
	Percentage	22.7	36.4	27.3	13.6	**100**
Job Enrichment	Frequency	7	17	13	7	**44**
	Percentage	15.9	38.6	29.5	15.9	**100**
Socio technical Systems	Frequency	17	15	9	3	**44**
	Percentage	38.6	34.1	20.5	6.8	**100**
Teams	Frequency	11	9	11	13	**44**
	Percentage	25	20.5	25	29.5	**100**

Figure 8: Views on Job Design Approaches



During the interview held with the production unit leader, it was concluded that among the various job design approaches, the company chooses to use job rotation more purposefully than the rest. This method proves most usefully when workers are requested to do the jobs of others in cases of absenteeism. The adoption of this approach, however, poses certain challenges to the company. These challenges come in the form of cost or safety issues and the possible deterioration of performance.

The use of socio technical systems or the interaction between technology and work groups is poor, which was evidenced by 38.6% of the responses being in that category. Only 6 of the respondents experienced the extent to which technology is adjusted to their work needs. With regards to teams, a larger percentage of the responses obtained show that workers are assigned to teams so that they can become more productive. But this increase in productivity tends to lessen the quality of the products produced.

Social Characteristics

The final context of job design that is dealt with is social characteristics. This element is considered to be somewhat less crucial to the design process the company undergoes. Nevertheless, it has been deemed to be considered important in this research, and as such, its findings are summarized in the following table.

Table 8: Views on the Social Characteristics of Jobs

		Poor	Adequate	Good	Outstanding	**Total**
Social Support	Frequency	21	12	9	2	**44**
	Percentage	47.7	27.3	20.5	4.5	**100**
	Frequency	5	15	18	6	**44**

Interdependence	Percentage	11.4	34.1	40.9	13.6	**100**
Interactions Outside The Organization	Frequency	11	13	13	7	**44**
	Percentage	25	29.5	29.5	15.9	**100**
Feedback From Others	Frequency	13	13	11	7	**44**
	Percentage	29.5	29.5	25	15.9	**100**

Almost 50% of the respondents claimed that the jobs designed don't take into account social support. On the other hand, a quarter of the jobs performed by the workers give them guidance and support. 40.9% of the workers witnessed interdependence among their jobs, whilst 11.4% of the jobs were carried out in isolation. These jobs don't require help or give help to other types of works. This could act as a hindrance to enhancements of better job execution.

In this company, there is a certain degree of outside contact. As presented in the Table, only 25% of the jobs had natures that don't require workers to go beyond their premises. The rest of the respondents claimed to have constant interactions with individuals external to their organization. On the topic of feedback from others, about the same percentage of respondents who said to have excellent outside interaction claim to receive feedback from other workers. About 30% did not get feedback. This proves that the jobs designed in this company give less emphasis on the availability of information about the effectiveness of performance.

Responses of the Interview Questions

Many of the interview questions in connection with the questionnaire have already been presented and interpreted. However, others that haven't been yet addressed are presented in the subsequent paragraphs.

One question asked to the production unit was concerning the individuals that are key to the determination and development of the design of work systems. It was later obtained that these include operators, mechanics, chemists, shift foremen, shift leaders and laborers. Among these, chemists, operators and laborers happen to be directly involved. In the process of designing jobs, the company along with these individuals faces some challenges that hinder the effective implementation of the design of work systems. These challenges include the following:

- Not being able to obtain workers with the needed level of education;
- Difficulty in allocating the required type of labor;
- Incurring substantial costs associated with such activities;
- The presence of poor working environment and health and safety issues, and
- Reluctance of the employees in complying with the needs of job designers.

With the issue of job design already covered in the questionnaire, the method of work measurement used in this company is stated briefly in the interview. As from the information gathered from the production unit, none but one method is applied on a full scale. Work sampling is used on processes by taking a sample test applied from the beginning to the end of the process. The outcome obtained from sample is later used to assess the time required to perform all of the other similar works.

The two main targets of job design that the company gives prior attention to are; (1) to accomplish the works that are set effectively, and (2) to manage the processes or machinery in a strict manner. They believed that setting these objectives and others would eventually help in increasing productivity.

However, one method of gaining over productivity that the company considers less vital is the involvement of the workers in job decisions. Employees don't really have a say in determining how and in what ways they get to perform their jobs. But they do provide an input as to the quality of workers; they get to advise their managers on the need to increase the current work force.

Conclusions and Recommendations

This chapter, which is the closing chapter of this paper, presents the conclusions derived from the analysis in addition to the recommendations forwarded from these conclusions. The full findings obtained from the questionnaires distributed and from the interview conducted have been adequately presented in the previous chapter. A comprehensive, step-by-step description has been given in connection with the results carried out in the study area. Subsequently, this chapter tries to give a summarizing snapshot of these findings along with a succinct description of indicators of further and improved future achievement and success for the company.

Conclusions

Out of the 60 questionnaires that were given out to a total of 466 personnel working at REPI, 63% were for male employees and the rest for female workers. Though deliberately altered to obtain the desired amount of data from both male and female workers, the overall composition of the work force is more male dominant with an average age of 35 and below. Most of the employees hold more of technical and vocational diplomas than 1st or 2nd degrees and thus, occupy mostly middle level positions. More than three quarter of the employees have worked for a maximum of 5 years only and this is observable in the insufficient amount of salary they are paid and in

the kinds of jobs they perform being more labor intensive and requiring less qualifications. Nevertheless, their salary seems to be balanced to the overall years they have served the company.

People work for a variety of reasons among which earning a living is the most decisive one. For the staff of REPI, along with all employees in every aspects of work, this is made possible by periodic remuneration. Management considers it imperative to develop suitable compensation plans for its employees. The company's basic compensation method includes payment on the amount of time worked, on the amount of output produced and on the knowledge and skill that the workers possess. Though all are applied at one time or the other, an output-based system is used in most cases, and this is occasionally followed by bonuses. Deliberate actions on the side of the employees and certain plans and laws enacted in the company are why overpayments are rewarded. These bonuses can be seen as reasons for the workers to be motivated enough to put forth more effort into their work in order to increase productivity.

Besides the compensation aspect of the company, other areas of quality of life have to be reflected on so that workers can, aside from improvement of productivity, enjoy a sense of well-being and gratification. This is evident to be possible from those physical factors that the company takes into thought while designing jobs for its workers. In order to increase the quality of output, decrease accidents and at the same time increase efficiency, the company invests its attention in temperature, humidity and noise factors among others. Another way of trying to meet performance is by allowing work breaks. It seems that some workers might occasionally feel bored because of working for long intervals. On the contrary, most workers enjoy a sense of control over their work as a result of working for flexible hours.

One of the most pressing issues that are prevalent in companies, in factories more often than not, is the presence of workplace accidents. Many workers are indeed exposed to hazardous circumstances. These accidents are equally due to unsafe conditions and carelessness on the part of the workers. In order to tackle such exposures to accidents, the company has imposed the use protective equipment, which a portion of the employees don't fully comply to. Other than this equipment, clinics are present inside and outside the company that helps workers regain their health in cases of illness and accidents. Though such services are available, there seems to be a lack of well established health and fitness facilities.

The operations manager uses job design techniques to structure the work so that it will meet both the physical and behavioral needs of the human worker. Time standards must also be set to measure these jobs in terms of how long it should take to complete them. With regards to job design, job designers take productivity as the main rationale behind successfully carrying out such activities. Other objectives include work efficiency and effective management of work processes. Individuals that are vital in meeting such objectives by directly participating in the job designing activities should be competent to do so. Among these individual are mechanics, chemists, operators and others. In relation with this, the company constantly faces challenges that hinder the proper design and implementation of job design and work measurement. These challenges come in the form of the costs that are incurred, safety and health issues and a disparity between the required labor and the available labor.

In an attempt to make jobs more interesting and meaningful, job designers frequently consider job enlargement, job rotation and job enrichment. Even though all are applied to some extent, it can be concluded from the

information obtained from the production unit that job rotation is more widely used than the other two. This is so for the reason that employees would be able to manage to carry on work if unpredictable events take place; and it also helps employees broaden their work experience. As to determining the total time that a worker spends on various activities, work sampling is about the only technique used throughout the factory. The main reason for the application of this technique could be to save the time spent on continuous observations and timing of activities.

After the jobs that need to be performed are identified, there are certain characteristics that call for attention for successful completion of these jobs. These characteristics require from the workers different means to carry out their job. Most workers perform more than one task in their day-to-day activities and as such their jobs frequently entail the entire work rather than pieces of the work. Hence, workers need to be acquainted with various expertises and duly need specialized knowledge and dexterity to properly perform these jobs. Even if skill variety is required on the part of the employees to a certain degree, the amount of difficulty incorporated in these jobs isn't that equal on a similar degree. Though not that complex, these jobs that the employees perform need unique problem solving capabilities so that complications can be properly tackled.

Other characteristics of jobs that are included are ergonomics, physical demands, equipment use, interactions, etc. When it comes to ergonomics, more than half of the jobs allow proper posture and movements for the employees and only a small percentage call for physical effort and activity. Then again, there is a small variety in the equipment used to complete the tasks and it turns out that this equipment aren't so complicated to correctly handle. Concerning some social characteristics of these jobs, not all permit in

granting assistance from others and provide information about individual performances. Yet others emphasize the contact of workers with individuals that are outside the company.

To wind-up, jobs possess many purposes and properties to the eye of the beholder. These properties are the reasons why people work. As a known fact, jobs proved people with a means to satisfy their basic sustenance primarily in the form of payments. On the other hand, people attach subjective purposes to their jobs that add quality to their lives. Socialization, self-esteem, self-actualization, status, physical and mental status are among such subjective properties. Therefore, the design of work systems needs to take into consideration these issues in order to successfully implement a sound job design and work measurement systems that adhere to the different needs of its workforce.

Recommendations

Based on the assessments made in the analysis and the conclusions forwarded in the preceding section, major drawbacks in some areas have been identified. As such attempts are made in proposing possible solutions to these setbacks. Not only setbacks but also areas where increased improvements are probable are addressed to aid the company in achieving enhanced success in the future times to come.

According to the above summarized conclusion, some possible recommendations are forwarded in the section to follow. These recommendations could serve as means for future improvements.

- One way of increasing the motivational level of employees is by increasing the level of responsibility and making jobs more interesting.

To achieve this higher extent of motivation, job enlargement and job enrichment techniques should be implemented next to job rotation. Accordingly, the company can increase productivity and quality at the same time.

- Aside from work sampling technique, job designers may also use standard elemental times and stopwatch time study. Time studies prove useful when every similar work that is performed can be measured by observing only one worker. But for those jobs that aren't convenient to measure directly, elemental times can be quite helpful when, that is, there are previously conducted time studies. This is used when reduction in cost is needed and when a continuous flow of work without disruptions is of utmost importance. These methods can be applied for observable jobs which are of short and repetitive nature.
- One area of compensation that the company rarely considers is the group incentive plan. This is mainly due to the decrease in quality it fears. But this can be tackled by emphasizing on team performance and providing bonuses for outputs above standards. As a result, this incentive plan should be used for assembly line workers.
- For jobs that do not lend themselves to incentives, like managerial positions, the company can use a time-based system instead of an output-based system. In this situation, for those jobs that are hard to measure in terms of outputs produced, a time-based system can instead compensate employees based on the total amount of time they have worked.
- Apart from the health clinics that are available, the company could also increase the health situation of its employees by introducing some health programs. These programs could be in the form of exer-

cise and fitness improvement programs. This will, in the long run, help the company in reducing health care costs and increase the efficiency of the workers.

- In order for workers to do their jobs to the maximum efficiency, they need to participate to some extent, if not entirely, on decisions concerning their jobs. In the case of REPI, workers need to be more involved in determining how they get to perform their jobs. This will eventually increase that sense of responsibility that they believe management entrusts upon them.
- With regards to the educational background of the employees, it is advisable if the company tries to hire workers with more 1st and 2nd degrees. This is so because those jobs that require more expertise will need more commitment and effort and as such the quality of output will increase. The company also needs to try to retain its employees for longer periods of time so that these workers can have a sense of dedication to their workplace.

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