Application of Systems Approach on Employee Training Programs: An Empirical Study in the Context of Some Selected Manufacturing Companies in Ethiopia

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Abstract
The paper discusses the applicability of systems approach on employee training programs in some selected manufacturing companies in Ethiopia. The research empirically examines the application of systems approach on employee training programs and involves qualitative analysis. The matching of components of systems theory and components of employee training programs are empirically discussed. The major findings of the research display systems approach can be applicable on employee training programs empirically. And the research found modified model for application of systems approach on employee training programs which include input, process, output, outcome, feedback and environment of employee training programs which are discussed indeed.
Keywords: System, System theory, System thinking, Training
Note: Systems theory and systems approach are alternatively presented in this specific study.

INTRODUCTION

System theory is general in that it takes in to account numerous systems that interact with other systems. It can be used as a research tool to study biology, mathematics, medicine, social science, or virtually any other topic (Covington, 1998). McLagen (1989) stated that general systems theory provides a powerful framework for the HRD practitioner and for any one whose role is to develop an organization and/or its people. According to Patton and McMahon (2006) Contributors to systems theory have come from many diverse fields, including physics (Capra, 1982), biology, anthropology and psychology (Bateson, 1979). As Jacobs (1989) cited several influential specialists have contributed to what is now known as general systems theory. Bertalanffy (1950), a biologist, is generally credited with providing the outline of general systems theory; Boulding (1956) did much to apply systems theory to economics; and Rapoport (1956) applied the frame work to mathematics.

Systems theory offered the ability to explain concepts such as feedback, self-regulating and interdependence of variables which preserved the complexity of the whole system(s). Many on the initial applications of systems theory focused on the change, change management and the decision making processes used within an organization (Irving, 1999).Systems theory also enables us to understand the components and dynamics of client systems in order to interpret problems and develop balanced intervention strategies, with the goal of enhancing the "goodness of fit" between individuals and their environments. Systems theory does not specify particular theoretical frameworks for understanding problems, and it does not direct the social worker to specific intervention strategies. Rather, it serves as an organizing conceptual framework for understanding (Meyer, 1983).

Ansari (2004) stated systems theory is the transdisciplinary study of the abstract organization of phenomena, independent of their substance, type, or spatial or temporal scale of existence. It investigates both the principles common to all complex entities, and the models which can be used to describe them. Hitch (1960) stated that in practice, systems theory offers a unique perspective on reality and a means to work in complex and unfolding environments by viewing entities as a system. The concept of a system is basic to systems theory. McLagen (1989) found a system is a collection of interdependent, organized parts that work together in an environment to achieve the purpose of the whole. Hall and Fagen (1975) stated a system is a set of objects together with relationships between the objects and between their attributes. Systems theory links fields and disciplines together through the use of common principles in solving problem.

System theory argues that no matter how complex or diverse the world, it is possible to find different types of organizations in it and that this organization can be described by principles that are independent from the specific domain being investigated. The uncovering of these general laws will provide a way to analyze and solve problems in any domain pertaining to any type of system (Boulding, 1956). According to Jacobs (1989) the basic tenet of systems theory is that systems consist of many interacting subsystems, which are distinguished by boundaries that, in turn, monitor and control the rate and flow of inputs from the environment to the system and the outputs from the system to the environment. In "Systems theory applied to Human Resource Development"

(Jacobs, 1989) presents systems theory as a unifying theory for HRD.

Training has been largely behavior oriented, in keeping with the emphasis on skills training. Systems theory is useful tool for designing programs to respond to clearly defined problems. It enables people to attend the whole and to classify and define the parts of the system (Watkins, 1989). Training is the process through which skills are developed, information is provided, and attributes are nurtured, in order to help individuals who work in organizations to become more effective and efficient in their work. Training helps the organization to fulfill its purposes and goals, while contributing to the overall development of workers. Training is necessary to help workers qualify for a job, do the job, or advance, but it is also essential for enhancing and transforming the job, so that the job actually adds value to the enterprise (Swanson and Holton, 2001).

Therefore, in the introduction the importance and application of systems approach on various aspects of organizations is quite evident. There is a widespread agreement among scholars and proponents of systems approach that it could also be applied on HRD practices including employee training programs. Therefore, this study is conducted in order to empirically verify the application of systems theory and to develop conceptual frame work on employee training programs in the context of some selected manufacturing companies in Ethiopia.

2. Review of Literature
2.1. Systems theory
Systems theory is mostly a way to think about asking and answering questions. It is this manner of thinking that makes the theory so useful to HRD. The basic tenet of systems theory is that systems consist of many interacting subsystems, which are distinguished by boundaries that, in turn, monitor and control the rate and flow of inputs from the environment to the system and the outputs from the system to the environment. A system approach is a goal oriented management tool that forces differentiation between problems, causes and then tests desirability of the solutions (Jacobs, 1989).

The system approach includes several subsystems which exists in an organization, and therefore affect each other. Managers have to look beyond immediate situations to foresee future situations. There is a need for a systematic and fruitful framework involving general relationships. The purpose is to improve organizational behavior for effective management. A system is developed where people work in a congenial atmosphere (Mishra, 2003).

2.2. System
According to Jacobs (1989), the concept of system is basic to system theory. A system is an entity that maintains its existence and functions as a whole through the interaction of its parts or elements. It is a group of things that are connected in some sort of way. The behavior of the parts depends more on how the parts are connected rather than on the nature of the parts. The resulting assembly does something and its activities are of interest to other groups. These interrelated elements are affected by being in the system and are changed by leaving it. The key point is that the character and properties of any system come from the myriad of interrelationships between and amongst the elements. Little about the whole system can be inferred from studying the workings of individual elements (Morgan, 2005).

A system is a portion of the world that is perceived as a unit and that is able to maintain its identity in spite of changes going on in it (Colbin, 2009). A system is a set of elements standing in interaction-- in other words, a group of things which have something in common. This includes any grouping with any sort of relationship - a collection of people, a forest, the planets, and rabbits on a hill-side, a pile of rocks, or anything else -- if it is possible to identify a group of things, this cluster can be seen as a "system"(Tamas, 1987).

Mishra (2003) defined system as a set of interconnected and inter-related elements of management activity and is an arrangement of components of activities performed for achieving certain objectives. And others Swanson and Holton (2001) defined A system as a collection of elements in which the performance of the whole is affected by every one of the parts and the way that any part affects the whole depends on what at least one other part is doing.

2.3. System thinking
System thinking is the use of systems approaches and the general logic that underlies them to view the world (Babington, 2006). Systems thinking is more an orientation or a perspective than it is a formula or prescription. It can be used to help people understand how systems work and how people can deal with them more effectively. It is a way of exploring real life rather than representing it. It is a technique to figure out what's going on. It encourages people to look for patterns of interaction and underlying structures that shape the emergent patterns of systems behavior. A corollary to this approach is the idea that structures matter much more than individual events in terms of determining outcomes. The focus of systems thinking moves in a variety of different directions compared to the linear style of conventional thinking. It is more than lateral thinking. System thinking is oriented more towards capturing flow and movement. In particular, it focuses on processes, patterns and relationships

(Morgan, 2005).

The approach of system thinking is fundamentally different from that of traditional forms of analysis. Traditional analysis focuses on the separating the individual pieces of what is being studied; in fact, the word "analysis" actually comes from the root meaning "to break in to constituent parts." System thinking in contrast, focuses on how the thing being studied interacts with the other constitutes of the system-a set of elements that interacts to produce behavior of which it is a part. This means that isolating smaller and smaller parts of the system being studied, system thinking works by expanding its view to take in to account larger and larger number of interactions as an issue is being studied (Aronson, 1996).

2.4. Characteristics of system theory

A business or industrial organisation has a system approach towards individuals, formal and informal organisations status and role, process, resources and goals which are interlinked to attain objectives through a synergic effect. The system approach is divided into closed and open systems. The open system consists of the input transformation process, output, feedback and environment. It is like a closed loop, which is autonomous and independent. It believes that the environment will not pose problems. Management of internal factors is basically useful for an organisation; however, the closed system is not perpetual. It breaks down when the environment influences the working conditions. Modern open theory discounts the environment effect. The open system is ready to be exposed to a spectrum of complex changes and challenges of the environment. It is well known as the modern open theory which is dynamic, adaptive, multilevel, multidimensional and multidisciplinary. It incorporates the elements of motivation which are important moving forces in an organisation. The open system is multidisciplinary because it incorporates different disciplines in the organisation. It depends on sociology, psychology, engineering, anthropology and so on for managing different activities of corporate units. It is the base of formulating organisational structure, and has the capacity for adaptation to change. The informal organisation and environmental conditions are given due weight age under the open system (Mishra, 2003).

2.5. Model of systems theory

The basic system theory model includes the (1) inputs, (2) processes, and (3) outputs of a system as well as a feedback loop (Swanson and Holton, 2001). In general systems theory, all systems include input, processing, output and feedback, which create relatedness between the parts. Furthermore, basic system theory acknowledges that the system is influenced by its larger surrounding system or environment (von Bertalanffy, 1984)

Figure 2.1: Basic systems model
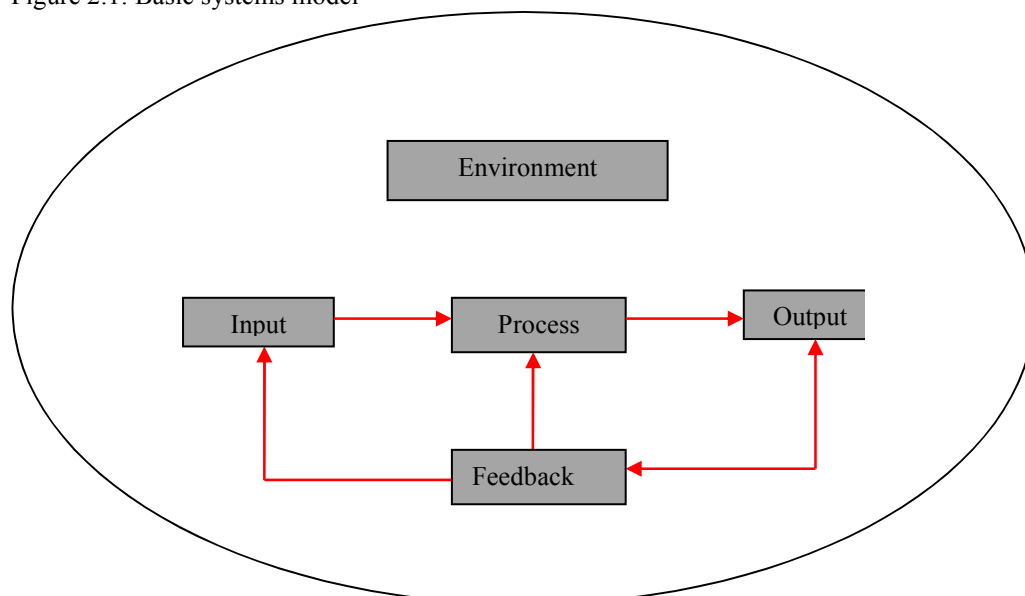
Source: Adapted from Swanson and Holton, 2001

2.6. Training

Many experts believe the only sustainable advantage an organization will have in the future is its ability to learn faster than its competitors. This competitive advantage can be achieved by transforming the organization into a learning organization. It's not altruism, goodwill, or kindness that transforms a manufacturing organization into a learning organization. Its bottom line results - Manufacturing firms that implement training programs increase productivity by an average of 17 percent (Karl, et al, 1996). According to Cartwright (2003) training is very

specific and is concerned with the mastering of a particular task or set of tasks. Swanson& Holton (2001) found Training is the process through which skills are developed, information is provided, and attributes are nurtured, in order to help individuals who work in organizations to become more effective and efficient in their work.

3. SIGNIFICANCE OF THE STUDY

In today's business environment where change is constant, technology is cheap and skill shortages are commonplace, people are the key differentiator between those businesses that succeed and those that don't. It is a lot wonder then that the system of employee training program plays a pivotal role in moving an organization forward. So this research would have the following significances to different concerned bodies.

- If companies want to practice system theory on employee training programs this study provides them indication to the major participants regarding the application of system theory on employee training programs.
- The paper may have invaluable contribution in filling the information gap in the areas of system theory and employee training programs.
- It serve as a pipeline in terms of reference for other researchers who want to conduct further study in all companies at the national level on the application of systems theory on employee training programs.
- It provides clear image of the application of systems theory empirically on employee training programs.
- Furthermore, the research finding gives information on how systems theory can be applicable on employee training programs in some selected manufacturing companies in Ethiopian context.

4. BASIC RESEARCH QUESTIONS

The research questions of this study comprise:
  i.   What is the nature of current employee training programs?
  ii. What are the components required to develop employee training program?
  iii. Do components of training programs match with those components of systems theory?

5. RESEARCH OBJECTIVE

  i.   To identify the components required for employee training program
  ii. To identify prerequisites needed to be in place to apply the concept of systems theory on employee training programs
  iii. To explore the applicability of systems approach on employee training programs in the context of manufacturing companies in Ethiopia
  iv. To develop systems approach model for employee training programs in manufacturing Companies

6. METHODOLOGY

6.1. Research type

The purpose of this study is to empirically investigate the application of systems theory on employee training programs in the context of manufacturing companies in Ethiopia. Since, the purpose of this research is to apply systems theory on employee training programs the type of the research is descriptive in nature and qualitative in its approach.

6.2. Sample and sampling technique

According to Marshall (1996) an appropriate sample size for a qualitative study is one that adequately answers the research question. The researcher used judgmental sampling technique to select the organizations and to gather the relevant data. And based on the researcher's practical knowledge of the research area and the available literature the investigator was selected purposively six manufacturing organizations to answer the research questions.

6.3. Instrument development

After reviewing different review literatures in the area the researcher has developed semi-structured interview, by writing down the topics of interest in the study and questions which were broad, open-ended questions that allow the interviewee latitude in constructing an answer.

6.4. Credibility of the Instrument

Credibility, transferability, and trustworthiness of the data collection instrument have been checked very carefully. The researcher has utilized credibility, transferability, and trustworthiness by employing similar interview for all interviewee in the selected organizations. And the researcher has collected the data free from any bias as the mouth word of the interviewee and analyzes recorded documents on employee Training program conceivably with the help of different review of literatures in the area (Golafshani, 2003).

According to Olsen (2004) triangulation is defined as the mixing of data or methods so that diverse view

points or stand points cast light up on a topic. The mixing of data types known as data triangulation is often thought to help in validating the claims that arise from an initial pilot study. So to keep the credibility of this research the researcher employed methodological triangulation by combining data which is collected through interview and from the companies document which includes training and method evaluation form, Ethiopian management booking form - which the training institute has already fixed the minimum and maximum number of trainees that will be received in each course, training method evaluation questionnaires, Ethiopian budget year training need form, training request form, registration format for induction training given to newly employed personnel, inter office memorandum, performance evaluation form and companies training report by relating two types of data so as to leave the transferability of each type of information intact.

6.5. Data collection tools
To gather the relevant data in order to investigate the application of systems theory on employee training programs the researcher employed semi-structured interview with representative of training program in the selected companies. The nature of the data was primary and secondary. the primary data is collected through interview from the companies training program representatives and the secondary data is gathered from training and method evaluation form, Ethiopian management booking form- which the training institute has already fixed the minimum and maximum number of trainees that will be received in each course, training method evaluation questionnaires, Ethiopian budget year training need form, training request form, registration format for induction training given to newly employed personnel, inter office memorandum, performance evaluation form and companies training report.

6.6. Data Analysis
The researcher analyzed and discussed the data as per the collected facts through interview from the companies training program representatives. Besides the interview the researcher analyzed the data by using the companies' employee training documents.

7. FINDINGS
The results from the data gathered through interview and from the employee training program documents of the manufacturing companies are analyzed and discussed together as follows:

7.1. Existing Employee Training programs in the companies
Research Question 1) what is the nature of current employee training programs?
Training makes a very important contribution to the development of organizations human resources and hence to the achievement of its aims and objectives. To achieve its purpose, training needs to be effectively managed so that the right training is given to the right people, in the right form, at the right time and at the right costs (Ghosh, 2009).The results of the nature of current employee training programs as the mouse word of the interviewee and training document analysis. The nature of current employee training programs in respondent organizations is to improve the aptitude, skills and abilities of the employees to perform specific skills. To offer employee training the companies use strategic plan of the organization, annual budget plan, qualification of education and work experience, list of employees attending training, training materials, general information and training program schedule from training institutions.

7.1.1. Strategic plan of the organization
To provide training with in their organization they used strategic plan of the organization in that by driving specific objective and action plan from the five years plan of the organization and by considering future requirements of training program based on their organization plan.

7.1.2. Annual Budget Plan
The companies use annual budget plan as input to organize training program. They utilized this by considering yearly plan of the organization which is planned to develop skill of the employees.

7.1.3. Qualification of education and work experience
They undertaken education qualification and employee work experience as an input to deliver training in their organization. As they reflected they employed this by assessing full profile of employees and by considering the type of training appropriate for them; and based on their performance in their work area or in performing their duty and assigning those who have weak performance to attend the training in all aspects.

7.1.4. List of employees attending training
The first thing considered within the organization to carry out training is the name of employees who took training and not to consider to whom to offer the training. So they took employee list as training input within their organization.

7.1.5. Training materials
Availability of materials like computer, projector, stationary materials, training room, and video camera are

considered as input to deliver training within the companies.

7.1.6. General information and Training program schedule from Training institutions

To facilitate the Training Program, the training institutions sent to them training program schedule which indicates the title, target group, the objective and contents of the course, the dates the courses will be offered, duration of the program, the fee per trainee for each of the listed courses, final registration dates and the training venue.

This helps them to identify areas of training with in their organization. Due to this they made use of this general information and training program schedule as input for training programs. The companies perform various activities to arrange training programs which includes need identification and gap analysis, identifying the type of training, method evaluation, contacting Training consultants, getting ready for the training, preparation of the trainee, presentation of knowledge and operations.

7.1.7. Need Identification

A training program is established when it is felt that it will assist in the solution of specific operational problems. Careful assessment is accordingly made of the training needs of each officer, right from the senior most to the junior most levels. The most important step they made was a thorough analysis of the entire organization with the immediate boss of each employee. The companies assessed the need identifications through the following steps.

➢ They identified organizational and production problems

This was based on low productivity, high costs, poor quality, excessive waste, excessive labor troubles, poor discipline, high employee turnover and high absenteeism.

➢ They Analyzed jobs and workers

Job analysis, employee appraisal and testing programs

➢ They Collected employee opinion and managerial opinions

They collected employee and managerial opinions through interviews and questionnaires to obtain views regarding the necessity and desirability of training programs.

➢ They anticipated impending and future problems

They identified training needs based on the expansion of new products, new services, and new designs, new technology and of organizational changes concerned with manpower inventory for present and future needs.

➢ Morale and attitude surveys

They made occasional personnel audit to forecast future promotions, skill requirements and merit rating, to initiate informal discussions and an examination of records and statistics regarding personnel, production, cost and wastage.

7.1.8. Identifying the type of training

They identified whether the training is in house training or external training. In house training is prepared and delivered within the company while external training is taken outside the organization either in taking trainer or sending the trainee to the training institution for a short period.

7.1.9. Method evaluation

Before the training is held they assess the content of training, way of delivery, place of training, fee and basic needs.

7.1.10. Getting ready for the training

In this case, they decided who is to be trained? The new comer or the existing one or all of them selected from all departments.

7.1.11. Contacting Training consultants

They sent letter of confirmation to Training institutions to apply and to notice them, which employee is going to take the training by including course title, course code, date, location, full name, current level and type, present level of responsibility, job title, organization, and full information of the employer who hold the training budget.

7.1.12. Preparation of the trainee

In this case, they putted the trainee at ease, in stating the importance and ingredients of the job and its relationship to the work flow and in finding out what the trainee already knows about the job and making them interested and eager of learning the job.

7.1.13. Presentation of knowledge and operations

The trainer would tell, show, illustrate and question the trainee in order to put over the new knowledge and operations. The trainer would tell the entire job and why each step in its performance is necessary. The trainer would give them instructions clearly and patiently by emphasizing on key points.

The companies take the following components as outcome after delivering employee training program which includes performance change, knowledge change, attitude change, Behavior change, end operational results employees carry out after attending the training.

These training outputs are considered based on:

➢ Giving written questions to the trainees to ascertain how far they have learnt the techniques taught to them and the scores obtained by them

It is prepared in the form of questionnaire to be filled by the trainees by including all things about the course

offered to trainees.

➢ Observing employees on the job and administering performance tests to them

After employees are trained, the output of training employees was observed and assessed by their supervisor. If the employees perform their duty with swiftness and accurateness comparing with their previous performance, the output of training becomes visible. This can be done through job evaluation four times within a year in these organizations; therefore this job evaluation shows the output of training in performing their job.

➢ Finding out trainees reaction in the work area following training program

In most cases, when employees attended training; supervisors also attend the training simultaneously with them and following the training; these supervisors observe the interaction of workers in changing their behavior, knowledge and attitude towards performing their duty. And also the supervisor see the employees end operational results in forms of performance appraisal.

➢ Eliciting the opinion of the top management about the trainees performance

Based on job evaluation following the training, the top management of the organization sees the result of the trainees depending on their previous and current performance after training. After all, the top management take decision depending on their performance either promotion or demotion. If the employee performs well, the employee promoted one step unless demoted.

They utilize employee testing, performance evaluation and employees daily report to check the effectiveness of training programs. They have undertaken a view of testing to see the effectiveness of training programs quantitatively and qualitatively. Quantitatively, when the employee produces extra amount of products compared to their previous performance accurately and swiftly. Qualitatively, when the employee gives on spot remedies for problems occurred in the organization. One Example of training feedback is to test the effectiveness of employees after training the supervisors change one part of the machine in case of machine operation; and if the employees get that part and provide remedies quickly the training is effective. This consists of:

i. Putting trainees on their own

If the trainees perform all their duties without any assistance, the effectiveness of the training becomes tangible. Then the effectiveness of the trainee by itself gives them feedback as they revealed about the success of the training. But if the trainees cannot perform their duties after attending training, the effectiveness also becomes visible. Then the ineffectiveness of training also gives them feedback about the failures of the training in case of testing.

ii. Frequently checking to ensure that they follow instruction

Employees get hold of daily report after they accomplish their task and provide it to the office bearer. This shows the daily performance of employees in performing their task and it is used as feedback on the training program.

Generally the companies consider Top managements and supervisors as training environment for employee training programs. Since the result of employee testing, employee daily report and employee performance evaluation goes to the top management and supervisors, they considered as environment for employee training programs.

7.2. COMPONENTS OF EMPLOYEE TRAINING PROGRAM
Research Question 2) what are the components required for employee training program?

The main aim of training in these companies is to induce a suitable change in the individual concerned. So, the components required for employee training programs is identified empirically from those organizations and the result is analyzed carefully. The components are classified under input, process, output, Feedback and environment of training.

7.2.1. Input of training

The identified input of training includes strategic plan of the organization, annual budget plan, qualification of education and work experience, list of employees attending training, training materials, general information and training program schedule from training institutions

7.2.2. Process of training

The identified process of training includes need identification and gap analysis, identifying the type of training, method evaluation, getting ready for the training, contacting training consultants, preparation of the trainee, presentation of knowledge and operations

7.2.3. Output of training

End operational result is identified as output of training

7.2.4. Outcome of training

The identified outcome of training includes performance change, knowledge change, attitude change, behavior change

7.2.5. Feedback of Training

The identified feedback of training includes test, employees daily report, performance evaluation

7.2.6. Environment of training

Top management and Supervisors are identified as environment for training.

## 7.3. MATCHING OF EMPLOYEE TRAINING PROGRAMS WITH COMPONENTS OF SYSTEMS THEORY

Research Question 3) Do components of training programs match those components of systems theory?

According to Swanson and Holton (2001) the basic model of system theory includes (1) inputs, (2) processes, and (3) outputs of a system as well as a feedback loop. Furthermore, basic system theory acknowledges that the system is influenced by its larger surrounding system or Environment. So this empirical study verify components of employee training programs as it matches with components of system theory in Ethiopian manufacturing Companies. Employee training programs in these companies include various components which are included under the basic components of system theory as discussed above (see discussions under 7.2).

8. CONCLUSION

According to the finding of this empirical study employee training programs in selected manufacturing companies includes input, process, output, outcome, feedback and environment of training. As input it include i) Annual budget plan ii) Strategic plan of the organization iii) Qualification of education and work experience iv) Employee v) Training materials vi) General information and Training program schedule from Training institutions. As process it includes i) identifying the type of training ii) method evaluation iii) getting ready for the training iv) contacting training consultants v) Preparation of the trainee vi) Presentation of knowledge and operations. Output of employee training programs is end operational results. As outcome it includes i) Knowledge change ii) Attitude change and iii) Behavior change iv) Performance change. As feedback it includes i) employee testing ii) employee daily report and iii) performance evaluation. Finally as environment it includes i) Top management and ii) Supervisors.

Accordingly, this empirical study concluded system theory can be applicable on employee training programs in manufacturing companies in Ethiopian as shown in the following developed model based on basic model of system by Swanson and Holton (2001).
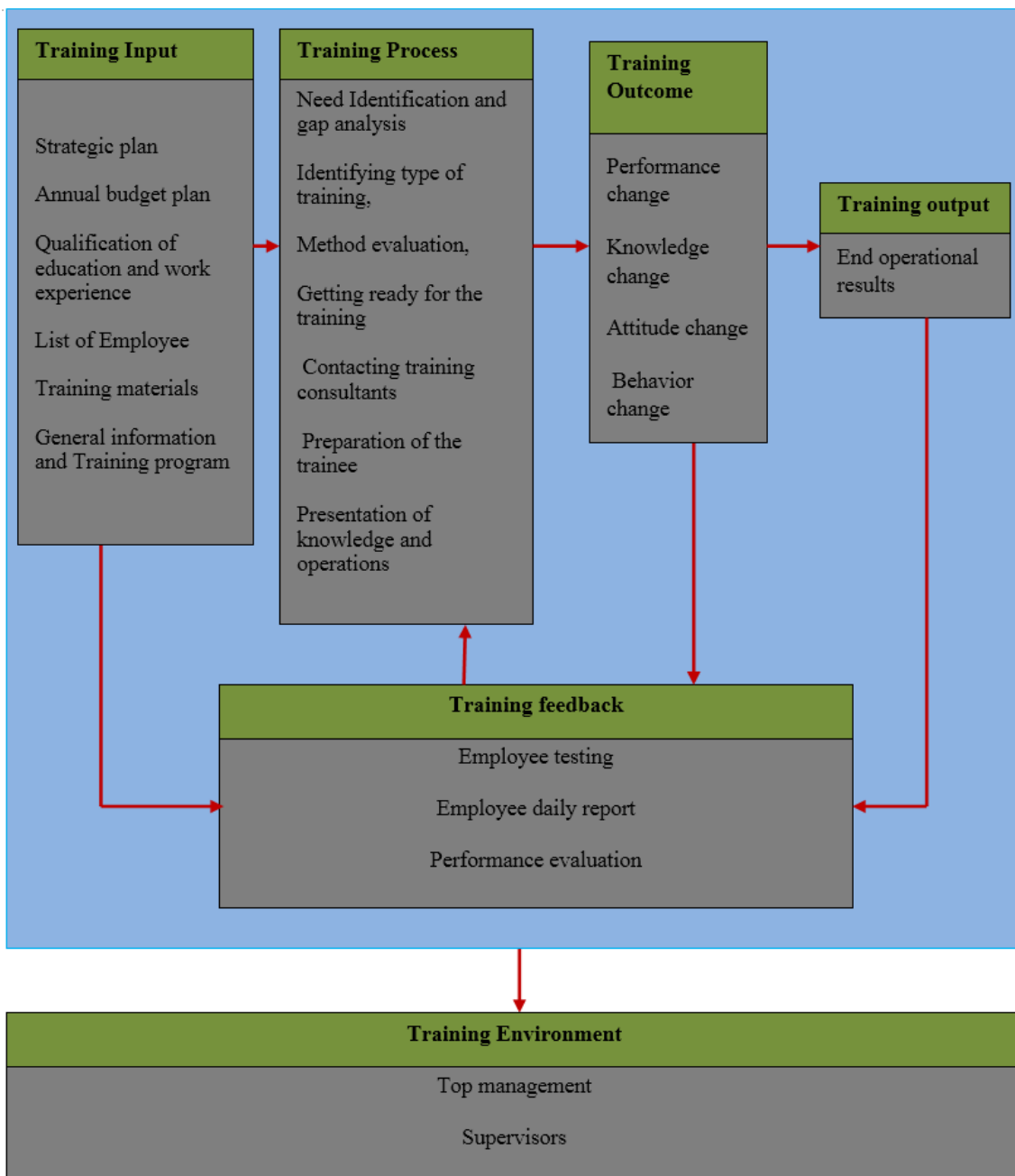
9. IMPLICATION FOR FUTURE RESEARCH

This research is conducted in some selected manufacturing companies in Ethiopia. If the goal of future researchers is to bring a well-established, results-oriented business that is a system dependent manufacturing companies, they need to carefully investigate the application of system theory on employee training programs in all manufacturing companies and other sectors in Ethiopia, as well as well they need to carefully asses the application of systems theory on the other components of human resource development (HRD).

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