ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

IMPLEMENTATION PROCESS AND FAILURE FACTORS ASSESSMENT IN METEC's MEDIUM SCALE TURN-KEY MANUFACTURING PROJECTS:IN THE CASE OF HIBRET MANUFACTURING AND MACHINE BUILDING INDUSTRY PROJECT

Master Thesis Proposal Submitted to the Department of Project Management for the Partial Fulfillment of the Requirements for the Award of Master of Arts (MA) Degree in Project Management

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BY

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St. Mary's University School of graduate studies, Addis Ababa May, 2019

DECLARATION

The under designed declared that this paper entitled implementation process and failure factors assessment in METEC's medium scale turn-key manufacturing projects constructed in Harar and Dire-dawa towns "is my original work". I have carried out this research work independently with the guidance and support of my research advisor. This study has not been submitted any degree/diploma in my institution and that all sources of materials used for the study have been duly acknowledged.

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Name signature date

St. Mary's University School of graduate studies, Addis Ababa. May, 2019

ENDORSEMENT

This thesis has been submitted to St. Mary's university student of graduate studies for examination with my approval as a university advisor.

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University Advisor signature

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List of Acronyms

SMEs small and medium enterprises

METEC metals and engineering corporation

HMMBI Hibret manufacturing and machine building industry

FMASE Ethiopian federal micro and small enterprises agency

TKC turnkey contract

QA quality assurance

GTP growth and transformation program

FDRE federal democratic republic of Ethiopia

TVET technical and vocational educational training

CKD complete knockout disassembled

SKD semi-finished knockout disassembled

MBF machine building factory.

PMF Precision manufacturing factory;

CMF Conventional manufacturing factory,

BMF Material treatment factory,

MB&SF Machine body and structure factory.

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Abstract

This thesis addresses the project implementation and assessment of failure factors of the regional flexible manufacturing workshop establishment projects. The goal of this research is to show the project implementation process along with stakeholder's roles and contribution, to identify the problems for completion on planned time, to assess the factors that potentially contribute for the failure of the project, suggest a method to safely hand over of the projects, to take lessons learnt.

In this work the researcher had identified and analyzed the factors for the failure of the implementation of turnkey projects. To identify these factors brainstorming was utilized. To analyze and prioritize the problems result of questionnaire, interview, observation, and Pareto diagrams were used. From the responses of the questionnaire researcher had concluded that, a remedy solution should be made by the stakeholders based on the intensity of the problem. The lesson learned from these questionnaire, brain storming, critical observation and structured interviews were used intensively. The development project consists of four stages conception, planning, implementation and closeout life cycles and it can assist in evaluating the strength and weakness of their whole system through SWOT analysis, targeting their improvement areas, setting up an action plan for improvements and tailoring a special part to the needs of their attention. Thus it can be used to improve the entire project implementation and control system of the contractor company. Finally a number of recommendations were proposed how to effectively implement the project management practices to complete the project and achieve its initial objectives.

CHAPTER ONE

INTRODUCTION

1.1Background of the Study

Small and medium sized firms dominate both developed and developing economies in terms of employment and number of companies. The ability of smaller firms to create jobs is clearly a major attraction for governments in the short term. SMEs must be encouraged and supported to flourish. This is important so that economic objectives (economic growth and development, favorable balance of trade and payment and employment) and social objectives (poverty alleviation and improving standards of living) can be realized(Schlogl,2004).

The main concern of SMEs is to develop various relationships crossing organizational boundaries in order to improve the performance, gain and strengthen competitive advantage, and most importantly, to enable market flexibility (Berglund, 2007).The term SME's universally stands for small and medium-sized enterprisesbut there is no consensus on the definition of SMEs. This is because definitions differwidely in different regions and depend on the phase of economic development aswell as their prevailing social conditions.

Therefore,the focus this study on enterprises called medium scaled flexible manufacturing enterprises project between METEC's Hibret manufacturing and machine building industry and different regional states of small and medium enterprises authorities,which falls under the second category medium scaled(Ethiopian Development Research Institute (EDRI, 2014).according to definition given in 2011 by Ethiopian Federal Micro and Small Enterprises agency (FMaSE). Which encompasses about 101 owner employee) too far to be medium scaled enterprise rather it seems large scale enterprise.

METEC with its one of major purposes for its establishment was to design, manufacture, erect, and commissioning of manufacturing facilities, mega projects, industries and such medium scaled factories at different regional states.Based on these production capacity METEC takes the major share and responsibility of the project work.Where the contractor HMMBI is in charge of almost everything, including design and execution, meaning that the contractor provides a client with the key when the construction is finished(HMMBI yearly journal Vol.1, 2014). And using clustering approaches for raw material, technology and marketing. METEC madeturnkey contractual agreement by the year 2006 E.C with different regional states and the two city administrations of Ethiopia, SMEs bureaus tobuild around 46

flexible manufacturing workshops within six months,with a single projectcostof around 47 million birrs.The financial source supported with 100% loan from regional micro-finances with interest rate of 12.5% via SMEs offices to employee manufacturing unions.In the first phase aiming that to enhance economic advantage, increase social value and technology transfer(METEC brochure, 2006 E.C). Each turn-key projectplanned in creating job opportunity for 101(one hundred and one) permanent owner employee per workshop with loan equity of around 500,000.00 birr per employee and in the second phase of the project, when work with full production capacity, the work shop planned to accommodate about 100 more temporary and casual/daily workers(from agreement document). Even though these projects believed in contribute for the country's industrialization strategy, none of them transferred to the client and to final owners the unionsexcept southern region five projects, which is also with a number of complains until this research work compiled in 2011E.C.

This research work mainly initiated with the reasons of personal observation of the problem with respect togovernment unable to achieve its goal, the contractor METEC unable to practice/use project management philosophy to accomplish the project within predefined plan, project practitioners/stakeholders with limited or no project management know-howand finally socio-economic impact on the owner's youth unions. Consequently, the projects seen unable to achieve its intended goal and seems to be failed. Therefore, this study work will focus on assessing of the main failure factors of the projects because significant amount of the country resources utilized but unable to complete the projects.

1.2Statement of the problem

METEC with its 16 industries engaged in many of the countries mega projects, for the success of these projects; it needs continuous supply of industrial spare parts, equipment and capable sub-contractors. With this reasons and industrialization strategy of the country, the idea of establishing of medium scale flexible manufacturing workshops building was initiated with METEC. All the responsibilities given to HMMBI because the industry is almost in a similar production system of machine tools manufacturing (METEC, 2014)

As a result,Hibret manufacturing and machine building industry(HMMBI) contractedmediumscale flexible manufacturing workshop building projects, but the implementation lag behindthe schedule, and what was planned in the contractual agreement submitted by the project contractor (External Supervision Repot, 2018).In addition to problems observed on completion and to handover the projects betweenHibret manufacturing and machine building industry andstakeholders in association with other quality, specification andthe hand overring proceduralproblems. Most of them terminated in all regions except Tigray and Southern regions, as a result,there is frequently request for payments according to the loan repayment schedule agreed with financial institutions without starting the actual production and generating of income due to delayed of implementation schedule derived mainly from external and internal causes. (HMMBI, 2014)

One of the best advantages of implementing such turn–key contracting type was, the contractor firm is responsible for every activity from design to construction, commissioning to delivering all required facilities for the workshop including training and initiating the production process. But this concept was not planned considering the reliable capacity, ability and past experience of the contractor. The problem started why the clients didn't and the owners participate in the idea conception and market assessment. The work relation did not pass through formal bidding process to identify and assess the capability of the contractor's company conductingsuch type of projects and its capability of implementation of project management methodologies and ultimately sustainability of market clustering. There are also technical problems like design of buildings, installation of machineries and electric line observed due to poor design, consultation and evaluation processes.

Based on the preliminary findings, the key failure factors tend to be luck of personnel competency such as having an articulate vision or ambition, innate abilities and working experience in the formal sector as a factory employee among all members of most

stakeholders.Luck of Managerial skillof the contractor company and entrepreneurial skills of the owner's members except for personal traits and qualities, many of the failure factors stated above can be emulated through teaching and training. On the other hand, some of the success factors include: availability of finance of credit (100% loan), working premises, delivery of all required machinery, accessibility of licensing requirements, market clustering with regional and federal governmental projects especially METEC was expected to outsource workto these enterprises,

The key problems of the project observed so far are unable to complete the project within the allotted 6 months of completion time (feasibility report, 2005 E.C) look appendix III and the payback period 4.1 years (feasibility report, 2005), all machineries and machine accessories did not delivered till now according to the contractual agreement, quality issues raised on the machineries, equipment, and building facilities (Evaluation report, 2009) look appendix, client complaining that machineries are not made (assembled) locally by METEC rather they are second hand from foreign countries like Chinafound during physical observation, external evaluation committee suggested that a significant number of machineries are under specification and not functional look appendix.When compared to the contractual agreement data and also the clients insisting to revise the total cost of contract for the reasons such as the feasibility study did not studied properly and was not participatory for all parties and during agreement there were authorities that approved the contract were not in the field of industrial projects and only based on political intention. For some created opportunities that could make the project to be in production as its actual status but due to members of the associations luck of experience and being dependent on government for most of circumstances unable and reason for frequent disorganizing of the owner members.

SMEs officers of both tows organize the members based on their political participation instead of their academic preparation and also being multi-disciplinary as a privilege. And

ultimately unable to make stakeholders integration and communication during the project implementation.Since Ethiopia is one of the developing countries, both organizational and projects phase works are poorly managed, consequently the performance of establishment of such manufacturing enterprises during the last few years has been declined and those under construction unstable to be completed within the time-table (Bloom et al., 2011).Customers are sources of requirements that must be met for project success.The contract awarded by the paying customer is the most obvious source of requirements. Contract terms and conditions prescribe what must be done (Morley,2012). And projects unable to fulfill these requirements considered a failed project.

Despite its importance and the given attention, the completion of the intended projectsin metals and engineering(manufacturing) sector are not yet ensured.All of the projects are at the same status found under installation and commissioning 5 years behind the schedule and less likely to be transferred to the owners soon, due to a number offactors. This research study work identify and analyze those factors that potentially hinders their success and reason for the project success. The responses from the respondents allow to identify the severity of the factors and ultimately to extract recommendations for successfully completing the projects to achieve their planned objectives.

1.3Research Question

The study is guided by the following key research questions:

- How was these turnkey projects initiated and theinvolvement of stakeholders?
- How the project input products, design and implementation was made in HMMBI?
- What is the status of project, to be said either failed or not?
- Which factors contributed for the failure of the Project and their consequences?

1.4 Objective of the Study

1.4.1 General Objective

The overall aim of this study is to assess the factors that potentially contribute for the failure of medium scale regional manufacturing turn key projects.

1.4.2 Specific Objective

The study specifically aims to:

- Explore the objective and level of stakeholder's roles and responsibility for the projects.
- Examine how the project input equipment and workshop buildings designed and made
- To identify and analyze problems of project implementation process at every project lifecycle.
- To investigate either the project failed or not, and analysis of factors contributed for the failure of Project.
- Recommend to improve project implementation practices and solve closeout problems.

1.5 Significance of the Study

Since, new for such industrial establishment projects and working with own intellectual and resource capacity. Sufficient number of studies did not undertake on METECowned either mega or medium size projects. There were also no clear project monitoring and evaluation report data available, in relation to resource utilization and progress achievement that mainly relied on the lack of both proper project management practices, implementation of professional project managers and the nature of contractor corporation METEC and its production methods. Therefore, this study identifies factors that contributes for the failure of the medium scaled flexible manufacturing turnkey projects specifically built in bothtows using modern project management practices and principles.

This study research output and resulting lessons drawn from the analysis ultimately used for the stakeholders to understand what mistake they did commit and to design corrective strategy to finalize and put the project in to preplanned production work.Comparing the shorter life since establishment and no experience conducting of such project's lessons will be learned on failure factors and their consequences are likely to benefit different companies.

1.6 Scope and limitations of the Study

The study focuses on assessing of factors for evaluating which factors contributes for the failure of the project. Evaluationof client's perceived quality and satisfaction level in the project deliverables with their own drawbacks in implementing and finalizing the project within the scope. The role and participation of all stakeholdersis very important for the project and should be evaluated in detail. However, this identical turnkey program launched at different regional states of the country Amhara, Oromia, SNNP and Tigray each with five workshops and Hareri regionand DireDawa city administration with one workshop each.This study will cover the projects in Harar and DireDawafor the sake of simplicity of data gathering and geographical suitability to reach all the stakeholders. And also, there are a lot of factors to consider and analyze but for convenience this study focuses on baseline data of the feasibility study, project scope statement, the project plan, project progress report data and contractual agreement documentand the primary data from distributed questionnaires, interviews and also physical observation.

METEC is under restructuring/reorganization due to heavy corruption, robbery and ultimately its inability of using resources to achieve the objectives. Therefore, it was impossible to conduct focused group discussion sufficiently with respective responsible managers and project coordinators. Therefore, data gathering relied on assessing documents, brainstorming, interviewing and also using questionnaires.

1.7 Organization of the Research Report

Structurally, the paper will be composed of five chapters. The first chapter will present introductory materials, which includes background of the study, problem statement, research objective, research questions and the scope and limitations of the study. The second chapter presents the related literatures reviewed during the desk research phase of the study.The report presents analysis and interpretation of the data gathered in the third chapter. Finally, in the last fifth chapter, the report will be concluded and summarized and also recommendations are made. Annexes will be supplementary parts of the report.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Theoretical Literature Review

2.1.1. Definitions

In order to distinguish between the project and project management it is necessary to develop distinct definitions for the two terms. A project can be considered to be the achievement of a specific objective, which involves a series of activities and tasks which consume resources. It has to be completed within a set specification, having definite start and end dates.

In contrast, project management can be defined as the process of controlling the achievement of the project objectives. Utilizing the existing organizational structures and resources, it seeks to manage the project by applying a collection of tools and techniques, without adversely disturbing the routine operation of the company (Kerzner, 1987). The function of project management includesdefining the requirement of work, establishing the extent of work, allocating the resources required, planning the execution of the work, monitoring the progress of the work and adjusting deviations from the plan.

Initially these two definitions may appear to overlap.Both are heavily orientated to the achievement of the project.The important distinction lies in the emphasis of bothdefinitions. The project is concerned with defining andselecting a task which will be of overall benefit to the company.This benefit may be financial, marketing or technical,but this will tend to be of a long-term nature, orientedtowards the expected total life span of the completedproject.In contrast, project management isorientated towards planning and control. It is concerned with on-time delivery, within-budget expenditures andappropriate performance standards. This is the context ofthe short-term life of the project development and delivery.Once delivery isachieved the management, as it relates toplanning and control of the development and delivery, willcease. A new, or different form of management, will thenestablish the operation and control of the project use fromthis point on.

Every project should follow some form of standardized approach.This approach views a project as a defined set of five managementgroups (PMI, 2008). These groups are briefly defined as follows:

1. *Initiating*—Tasks and activities that conceptualize and/or authorizethe project or phase.
2. *Planning*—Activities and related tasks that define and refine objectiveswithin the project.
3. *Executing*—Activities and related tasks that coordinate resources tocarry out the plan.
4. *Monitoring and controlling*—Monitoring and measuring progress regularlyto identify variances within the plan, so corrective actions canbe taken if needed.
5. *Closing*—Finalize all activities/tasks and above processes to closethe project.

2.1.2 The nine organizational knowledge management areas (PMBOK, 2012)

1. *Project integration*—These are processes (i.e., coordination of proceduresand phases) in place to develop, manage, and monitor yourproject, which includes change control.
2. *Scope*—These are processes (work included and excluded) in place todefine the project work.
3. *Time*—These are processes (i.e., estimating and scheduling) in placeto make to support schedule development and status tracking.
4. *Cost*—These are processes (i.e., costing and cost control) in place tosupport budget planning and status tracking.
5. *Quality*—These are processes in place to support meeting qualitygoals. There are three types of quality assurance (QA) projectreviews: deliverable, compliance, and health. *Deliverable* is any tangibleoutcome or item produced to complete a project; this can rangefrom a client's approval of a project plan to completion sign-off.Compliancecovers areas such as meeting the requirements of a projectand complying with established standards and processes.Healthtells how well a project is doing; if it has run off the rails, the teamcan use the review to decide which actions to take to get the projectback on track.
6. *Human resources*—These are processes (i.e., acquiring, developing,and managing) in place to make sure you have the right project teamand support people (i.e., sponsors, stakeholders, and end users).
7. *Communication*—These are processes (i.e., planning and managingteam, user expectations, and performance) in place to support meetingyour information needs.

8. *Risk*—These are processes in place (i.e., identifying, performing qualitativeanalysis, and planning responses) to support preventing a potentialevent or future situation that may adversely affect the project.
9. *Procurement*—These are processes (i.e., planning the solicitation andobtaining) in place to support the procuring of goods and services,which includes good contract management.

2.5 Cluster development for project implementation and sustainability.

Implementation and selection criteria:In general, the Government established clusters permit greater focus of public resources and allow the provision of support to enterprises more accessible and feasible. However, some problems were experienced while allocating premises to SMEs. First, the selected production locations where the buildings have been built did not take into account the overall economic environment of the locations and the availability of market-outlet that entering enterprises can use.

2.5.1 Extent of trust and collaborative networks.

The types of advantages that are commonly seen in natural clusters such as the development of trust and collaborative networks, which are essential to address common opportunities and threats, are mostly absent in many of the case studies of the Government created clusters. However, there are some instances where some enterprises, especially those that receive relatively large orders from companies and factories elsewhere are able to initiate linkages with other enterprises in the cluster by either sharing the orders or giving out a subcontract for certain parts of the product. Although such linkages are low, it could be one area of intervention in cluster development policies by either giving training on the advantages of collaboration and by appointing brokers and intermediaries to initiate and organize dialogues between enterprises in the cluster.

2.5.2 Sustaining market linkages to enterprises:

Given the limited time that enterprises are allowed to stay in Government created clusters (maximum of 5 years), the third lesson drawn from the case studies has to do with the possibility of maintaining the market linkages that enterprises have established in the Government created clusters when they move to another location such as an industrial zone. Enterprises in Government created clusters were asked how they would be able to maintain their market linkages if they move to another location. The answer to this question differs depending on the type of marketing channels used by enterprises. Those enterprises that have their own selling premises and those that sell their products through orders from other companies responded that they will be able to maintain their current customers even if they

move to another location because the marketing outlet that they are using, to begin with, is not tied to their production cite. But for those enterprises that do not have their own market outlets except for the shop owners around the clusters and in big markets responded that they may lose their market outlets unless they have their own selling premises.

2.6 Project success and/or failure

The definition of a project has suggested that there is an orientation towards higher and long-term goals. Important parameters within the goals will be return on investment, profitability, competition and market ability. A range of variables and factors will affect the ability to achieve these goals, which have been identified by various authors. The following list has been derived from the writings of Cash, Fox, Baker, Kerzner, Wit 2 and Kumar T, 1987.

1. objectives;
2. projectadministration;
3. third parties;
4. relations with client;
5. human parties;
6. contracting;
7. legal agreements;
8. politics;
9. efficiency;
10. conflicts and
11. profit.

2.6.1 What Is Project Failure?

No failure occurs in isolation. All failures are system failures in the sense that they are actually the output of a particular system. That is to say, there are features or defects in the system that produced or allowed the failure.Broadly speaking, a system fails if it meets either of two criteria:

1. It does not satisfy the requirements of those involved with the system—management,users, or other affected parties. Project failure usually implies not meeting cost, schedule, performance, quality, safety, or related objectives.
2. It produces results that are undesirable to those involved with it. A failed project does not meet user or developer expectations or leaves them worse off than before.

These two kinds of failure can be mutually exclusive: while one of the party's experiences failure, the other experiences success. These two kinds of failure are sometimes interlinked, as the project end item itself failed.

2.3.2 Conceptual framework of the project management for projectfailure.

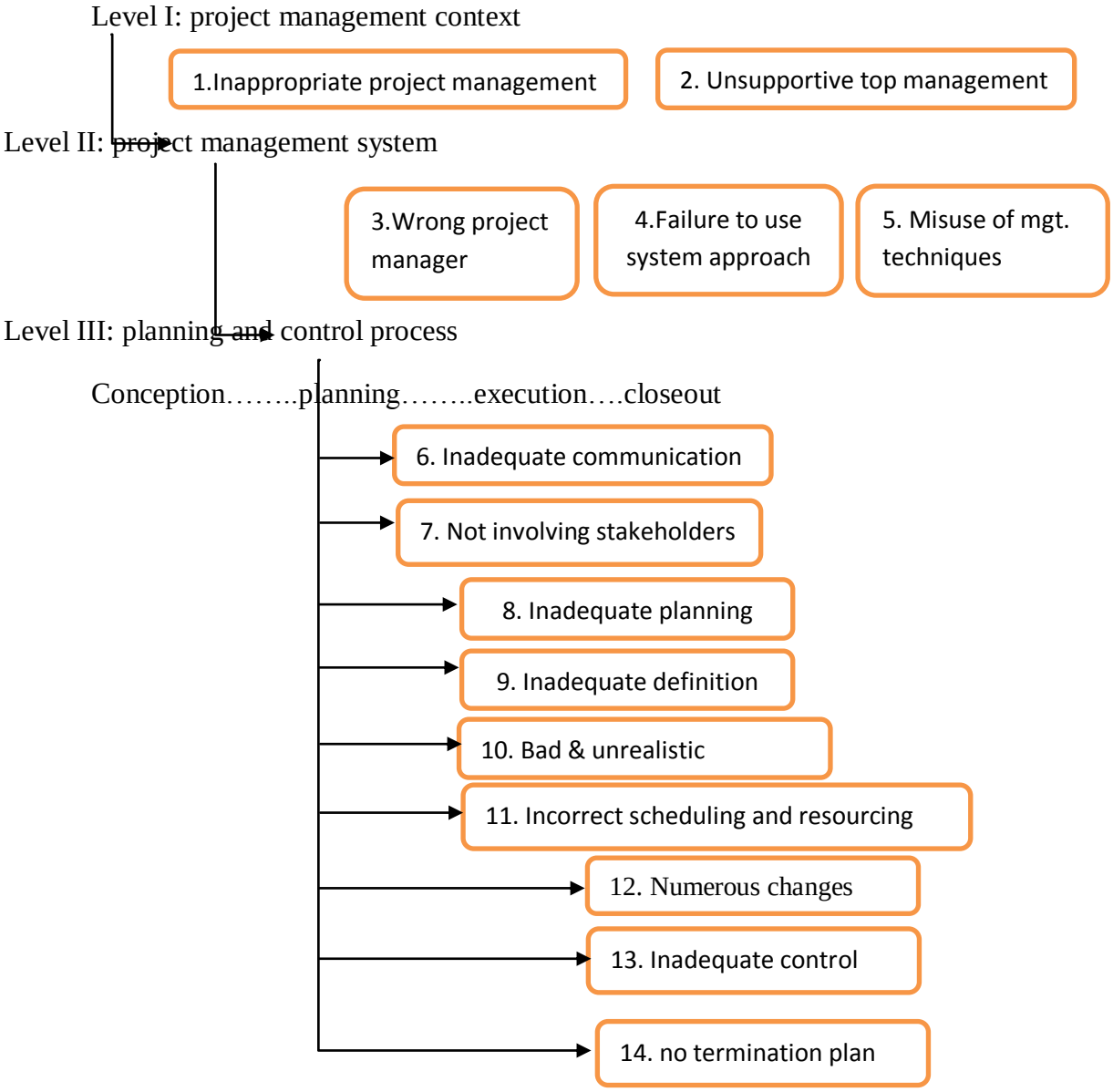


Figure 2.1 Contextual framework of project management for assessing project failure.(Nicholas, 2004).

2.7 Levels of project failure

2.4.1 Level I: Failures in the Project Management Context

These are sources of failure traceable to the inappropriate "fit" of the project organization to project objectives, project tasks, top management, and the larger environment. They include the use of a project management approach or model that is incorrect for the project objectives and environment, and lack of top management support for the project.

a) Inadequate Project Management Approach.

The project does not have the right organization structure, project manager, or team (in terms of skills, experience, authority, formality, or complexity) to "fit" the project. For example:
The project organization structure, planning, and controls are incongruent orincompatible with the project situation, the philosophy of the project manager, or corporate culture and objectives.More emphasis is placed on keeping the team busy than on results. Members of the team are assigned to the project without regard to appropriate skills and experience.Either no one is held accountable for the entire project, or the responsibility, expectations, or authority of the project manager are unclear or undefined(Nicholas, 2004).
A project team, project manager, or project structure that was successful in the past is "plugged" into a new project without considering the unique requirements of the project or distinguishing characteristics of its environment(Nicholas, 2004).

b) Unsupportive Top Management

Top management does not give the active and continued support necessary to achieve project goals. This is revealed in many ways. For example:Top management does not yield adequate responsibility or authority to the project manager, or back the project manager's decisions or actions.The company does not make policy and procedural changes (budgeting, planning, and control systems, reporting and authority relationship, etc.) needed to conduct effective project management.Top management does not participate in reviewing project plans and progress.

2.4.2 Level II: Failures in the Project Management System.

These are sources of failure traceable to project leadership, philosophy, and practice. They include the wrong project manager, neglect of the systems approach in the project life cycle, and misuse of project management techniques.

a) The Wrong Project Manager.

The person in the role of project manager does nothave the background, skills, experience, or personality to lead and manage the project.For example: firstthe project manager is unable to confront conflict and does not ask tough, probing questions, and cannot effectively argue for the best interests of the project.Secondly,the project manager cannot make the adjustment from a traditional workenvironment to the change and uncertainty of projects and lacks the ability to function effectively under short time frames and stressful situations and lastly the project manager is not well-rounded in technical and managerial skills.
Sometimes this arises from a variation of the so-called Peter Principle: putting a good technician into a managerial role about which the project manager knows nothing. In other cases, the project manager has managerial skills, but is so preoccupied with administrative

details that she ignores critical technical matters. She lacks the skills and charisma to command the respect of the project team.

b) **Ignoring the Systemic Nature of Projects.**

The project is not treated as a system.Elements and processes of the project are compartmentalized without regard to their interaction. For example:Hardware, software, resources, and facilities are viewed independently without regard to their relation to overall project objectives. Emphasis is placed on individual activities rather than on project objectives.The evolutionary process of systems development is viewed piecewise, one step at a time, without regard to subsequent or previous stages. This is evident by poor planning for future stages and inadequate evaluation of past stages. Problems are passed from one phase to the next.

c) **Inappropriate or Misuse of Management Techniques.**

Project management techniques are misunderstood or improperly employed. The problem lies with the project manager, the project team, or the techniques themselves. For example:The project manager fails to distinguish non-project techniques of planning, coordinating, and control from those necessary for project activities. The project manager or his team do not understand the need for tools such as PERT, WBS, performance analysis, conflict confrontation, and team building; these techniques are used incorrectly or not at all.The project manager does not attend to the human/behavioral side of projects; he does not build a project team, help team members understand the project goal, nor inspire them to work together toward the goal.The techniques used are too sophisticated or otherwise inappropriate for the particular project. Schedules and reports are too detailed or insufficiently detailed for project decisions. Manual techniques that are simpler, more appropriate, and better suited for small projects are bypassed in favorof sophisticated (but unwieldy or unnecessary) computerized reportingsystems.

2.4.3 Level III: Failures in Planning and Control Processes.

These sources of failure rest in the project planning and control process. As shown in Figure2.1 abovesome, like poor communication and inadequate user participation, can occur anytime in the project and require continuous attention. Others, such as inadequate definition, estimation, scheduling, or control occur primarily during certain phases of the project.

a) Inadequate Communication in the Project.

These are problems that stem from lack of information quality, accuracy, or timeliness, poor data collection and documentation, or inadequate distribution of information to those who need it. For example:Early in the project, information about objectives, responsibilities, and

acceptance criteria is not documented. No attempt is made to identify information and sources that will be needed during the project. Parties that "need to know" are not identified or kept informed.During the project there is no posting or reporting of information about project status or about changes to the plan or end-item.Insufficient meetings are convened to collect and disseminate information. Reviews do not delve deeply enough nor ask probing questions. No project log or audit trail of project development is kept.The quality and quantity of information gradually lessens as the project progresses because "there is not enough time." Communications are not documented so it is difficult to distinguish facts from assumptions.

b) Failure to Involve the User.

The user or customer does not participate in the planning/ definition/design/implementation process, and user needs are disregarded. This is one of the most frequently mentioned sources of project failure. Failure to involve the user early in the project results in lack of agreement about requirements, numerous change requests later, and conflict between the user and project team during implementation.Even when users do participate in defining requirements, without continued involvement they cannot visualize the appearance or functioning of the final end-item and are dissatisfied when they see the result. Problems are aggravated and more difficult to solve when there are multiple users. Both the user and project management are to blame:The user may feel awkward or uncomfortable and try to minimize his involvement. Some users resist participation, even when invited.The behavior of the project team discourages user involvement. Members of the project team may behave arrogantly and make the user feel ignorant or inferior.Such behavior delimits user/project team trust and strains communication.

c) Inadequate Project Planning.

Analysis and planning of project details is inadequate and sloppy; reports and recommendations from previous projects are ignored. Instead of preparing in advance, management reacts to things as they occur. Although poor project planning by itself is a major reported source of project failure, also cited are three particular features of planning, definition, estimating, and scheduling.

d) Inadequate Project Definition.

Vague, wrong, misleading, or absence of project definition is a frequently mentioned cause of failure. There is no formal definition of technical requirements, tasks, or project scope. Definition problems result from lack of, or a poorly prepared proposal, WBS, responsibility matrix, or work role definitions.Lack of user involvement in defining project scope, tasks,

and requirements. The project team never becomes familiar with the user's operation and cannot construct a design that relates to user requirements.

e) Bad Estimating of Time and Resources.

Estimates of resource requirements, activity durations, and completion dates are unrealistic. Bad estimating occurs because:Standards or files of similar projects are not used to estimate how long the project should take.

Estimates are made without regard to the experience of the workers. It is assumed that all personnel are "experts" and that they will perform the work without a hitch.Estimates are also prepared by people unfamiliar with details and problems; those responsible for the work are not involved.Not enough time is allowed for estimating.The user exerts pressures to get the project done quickly; this results in setting unrealistic deadlines and eliminating "unnecessary" tasks.

f) Incorrect Scheduling and Handling of Resources.

Scheduling and allocation of resources are incorrect; assignments are not anticipated; resource skills and capabilities are unknown; and resources for backup are unavailable. The problem begins during planning and continues throughout the project, Resource requirements are not anticipated and scheduled, and resource issues are addressed only as they occur. There is no skills inventory showing who is available for the project.Project personnel are reassigned or turned over without readjusting the schedule to allow for lost time or the learning curve.

g) Numerous Changes during the Execution Phase.

Changes are made to the original requirements without corresponding changes to the schedule, budget, or other elements of the plan. This oversight leads to inadequate project communication, poor project definition, lack of user involvement, and sloppy project control.

h) Inadequate Control.

Project management does not anticipate problems but reacts after they arise; control is focused on daily issues without looking ahead to potential problem situations; management waits until near the completion date to see if the project is on time. Sources of control problems include:Definition of work tasks that are too large to be effectively controlled, work packages and work groups that are too large to be supervised, and milestones that are too far apart to permit stepwise monitoring of the percentage of project completed.No adherence to standards or specifications for design, documentation, testing, or evaluation. Auditors do not perform careful evaluation, and evaluation is not used to determine why problems arise.No attempt to resolve emerging problems early in the project. Instead of being prospective and

preventive, the control process is retrospective and curative. No forecasting or planning of the funds needed to guarantee completion of project objectives.The management system takes on greater importance than the people in the system or the project end-item. This exacerbates peoples' tendency to resist controls and encourages them to circumvent or sabotage control procedures.

i) Project Termination is Poorly Planned.

It is not known what constitutes project completion or the end-item, what the acceptance criteria are, or who must sign off the project; there is no formal termination procedure addressing objectives, performance, end products, and maintenance issues; the impact on users is not predicted; personnel are not evaluated for their performance; there is no post installation survey addressing system bugs, necessary or already made changes, results, or usefulness.This problem is often related to poor project definition and lack of user involvement:When project termination is not clearly defined, the project is allowed to continue even after it has long ceased to make cost-effective progress.When users are not involved in planning, there is greater chance of disagreement over final conditions acceptance. After acceptance, problems with the end-itemgo unidentified or are permitted to continue despite user dissatisfaction. Bad project termination has negative consequences beyond failure of the immediate project. When no attempt is made to review project performance, it is unlikely that any knowledge can be gained to transfer to other projects. Recommended enhancements to the system go undocumented and are lost forever. When project personnel are not evaluated at the end of the project, their work performance is forgotten and there is no accurate basis upon which to make future work assignments.

2.4.4 Interdependency of Factors

The Figure 2.1 above implies that an inadequacy at one level has negative impact on the next lower level. For example, selecting an inappropriate project management approach (Level I) may cause project systemic features to be ignored, the wrong project manager to be chosen, or project management techniques to be misused (Level II); in turn, these lead to poor communication, inadequate definition and scheduling, and other problems in planning and control (Level III). A problem at higher levels (I or II) increases the chance of project failure even when there are no inadequacies at Level III. For example, strong user involvement or good planning (Level III) alone are probably not enough to prevent failure if the project manager is unskilled or a poor leader (Level II). Similarly, even an exceptional project manager will have trouble preventing failure if top management does not support the project (Level I). Thus, there is good reason for strong emphasis on Levels I and II because,

generally, correct action at these levels helps eliminate or mitigate problems at lower levels. For example, using the appropriate project management model and having top management support tends to encourage (or mitigate the problems of) selecting the right project manager, using the structured systems approach, and using the right management techniques; these, in turn, tend to mitigate problems and reduce sources of failure further down in the planning and control process.

The caveat is that while eliminating sources of failure at higher levels tends to reduce failure at lower levels, the precaution does not guarantee success. Given the uncertainty of projects, causes for failure can develop at any level at any time. Management must continuously monitor and address all failure risks and new problem.

2.5 **Performance indicators**

The following performance indicators will give a clear idea about the programof the project.

- Time Overrun
- Cost Overrun
- Project Sickness

2.5.1 Time Overrun

The zero dates are not same and the meaning of completion may also differ from project to project. But many people would not be interested in the technicalities of a schedule. In order to get a project cleared through the approving authorities a schedule may be fixed up which can be far from realistic. The vendors and contractors would only add to the confusion by promising deliveries, which can make anything possible on paper. Besides a defective design and subsequent modification/change to suit the project's requirements also increases time and cost. How much time a project eventually takes and who contributed to overruns—these are questions that no one can answer without doing some research. In such circumstances for most projects, timeoverruns cannot be used as true indicators for project management performance.

2.5.2 Cost Overrun

The situation, however, is not so vague regarding cost. While time can be misquoted, cost cannot. Anything done to a project, including time overrun would be reflected in the cost. If a project is not managed well, its cost will go up; conversely, if a project is managed well, its costshould come down. Therefore, cost can be used as an indicator for project management performance. But cost estimates in a project, as we have discussed before, are to be revised at various stages to improve their accuracy, and they invariably increase after every revision.

Cost overrun, the expression, which is used to represent the variance between the original sanctioned cost and the final cost incurred, would then provide no indication of managerial performance.

2.6 Project stakeholder analysis

A stakeholder analysis is a technique to identify and assess the importance of key people, groups of people, or institutions that may significantly influence the success of an activity or project. The project team identifies internal and external, positive and negative, and performing and advising stakeholders in order to determine the project requirements and the expectations of all parties involved. The project manager should manage the influences of these various stakeholders in relation to the project requirements to ensure a successful outcome.

2.6.1 **Stakeholders category.**

Astakeholder is any individual, community, group, or organization with an interest in the outcome of a program or a project, either as a result of being affected by it positively or negatively, or by being able to influence the activity in a positive or negative way. They are categorized as follows.

1. Key stakeholder: Those who can significantly influence or are important to the success of an activity
2. Primary stakeholder: Those individuals and groups who are ultimately affected by an activity, either as beneficiaries (positively impacted) or those adversely impacted
3. Secondary stakeholder: All other individuals or institutions with a stake, interest or intermediary role in the activity.

2.6.2 Stakeholders Power and power sources

The aim of this building block is to identify, in relation to the issue at stake and the objective of the change process, those stakeholders who are significantlyable to influence decision-making by virtue oftheir position, capabilities, knowledge, connectionsand scope of influence. This influence may exist inrelation both, to achieving the objective and to the process of collaboration that can lead to it. Keystakeholders, for example, have considerable influenceon the participation of other role players; theyallow the participation of others along a continuumthat ranges from full inclusion to total exclusion.Key stakeholders have also powerful connections,meaning they have numerous relationships with otherrole players both institution-bound and personal.Finally, key stakeholders without whose explicitconsent the reform process cannot be initiated areverseto players. They can build the momentum and thespace to the intervention to develop, but they canalso block it.

The analysis is focused on three core functions ofkey stakeholders:

Legitimacy: Institutional position, ascribed or acquiredrights, e.g. which are formalized by law; the taskbeing undertaken or through public consent andwhich are considered to be legitimate.

Resources: Knowledge, expertise and capabilities,as well as material resources that allow the keystakeholder to exert a formative influence on theissue and the change objective or to manage andmonitor access to these resources.

Connections: The number and quality of relationships to other actors who are under obligation to or dependent on the key stakeholder.

2.7 **Project contract**

The Project contract is useful tool to properly clarify and define the project. The Project contract – sometimes also called the project brief – is one of the early descriptions of a project.The Purposeof a project contract documents the essential elements and aspects of a project in its early stage. It provides a guideline and definition of what needs to be done and achieved. A more detailed version is often called Project Definition Report.

2.8 Turn-key Contract

There is a general observation that by reducing the number of contractor better project can be ensured. In a turn-key project a single contractor has complete responsibility to supply the owner a plant which is complete and ready for the owner to operate by simply turning the key.

Since the contractor of a turnkey project is expected to do everything right from scratch, the scope of contract covers all areas of the project, viz., design, engineering, construction, structural work, supply and erection of plant and machinery, supply of spares, testing and commissioning. Since a single contractor does the entire work, turnkey contract agreements invariably have a clause on performance guarantee.This kind of project can substantially shorten project times, primarily by overlapping the design and construction phases so that concurrent activity is possible, with construction starting and ending sooner. Yet, if the schedule is not being managed properly, delay is very common in this procurement system (Posner, 1987).

Turnkey projects involve delivery of a complete system and the construction organization is typically involved in the early specification phase of the project, project negotiations, setting up the project, building strong financial and relational positions within the business milieu, and handing the finished system over to the buyer (Jafari, 1990).

In addition, turnkey projects often include a combination of the following elements (Morris PW G and Hugh, G H, 1986).Financing, Design, Construction, Manufacturing, Installation, Operation of the finished system, Training of the buyer's personnel to operate the system,warranty period and Guarantee of the whole system.Furthermore, the literature indicated that project failure brings about certain effects (Jagboro, 2002), (Pourrostam, 2011). A range of different factors need to be considered in construction project, a process that extends from basic planning through to construction and maintenance management. These include standards, regulatory consents, and environmental rules see Fig. 2.3 below.

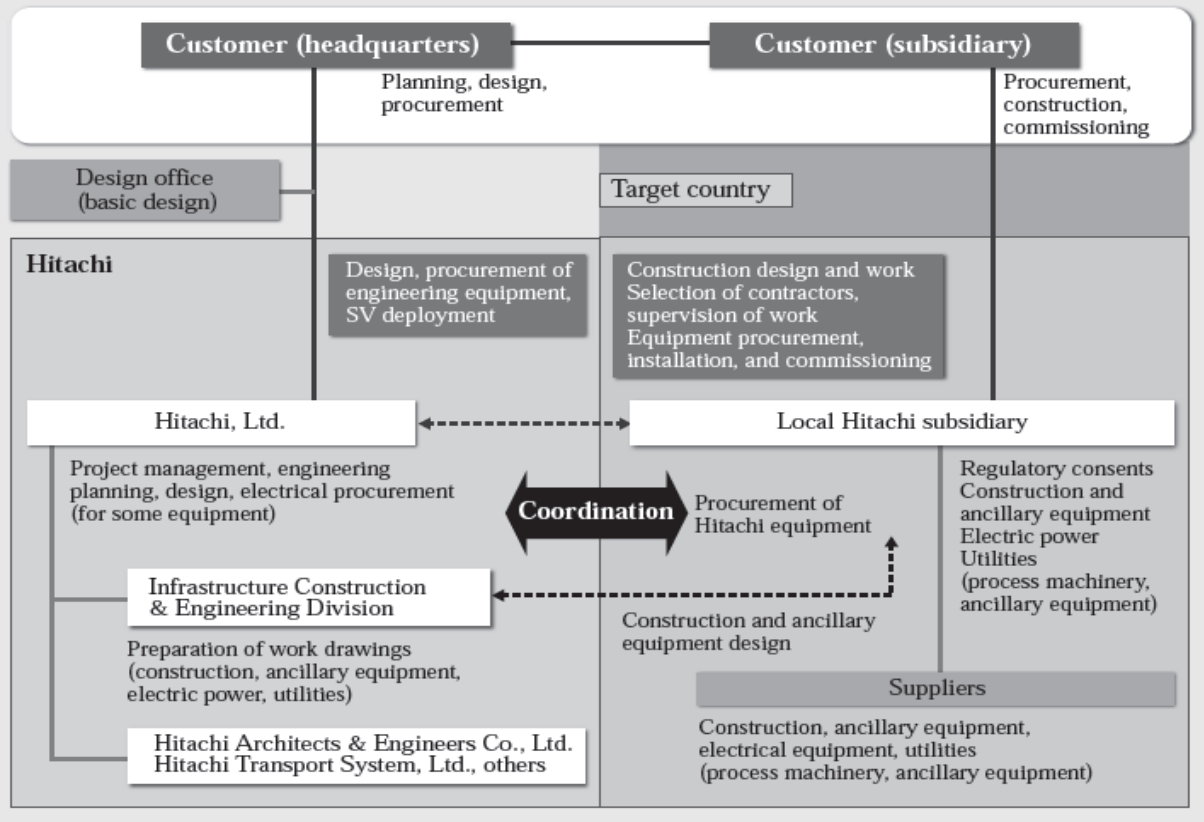


Figure 2.2Collaborative Arrangement with Parties in turnkey projects (Hitachi, 2013)

2.9 Empirical reviews

The collaboration between Japanese company Hitachi and a company considering the construction of a new plantsOrganizational structure for delivering total plant solutions (Turnkey Construction of Factories in Asia). Builds industrial plants, such as clean rooms and factories for pharmaceuticals, food, and chemicals, Based on its many years of experience, Hitachi can provide comprehensive support for construction that considers factors such as ensuring that planning takes account of local design standards, and that work conforms with the country's legal system and other practices. The company offers a total plant solution that

includes support for maintenance management as well as turnkey contracts that cover everything from earthworks to design, construction, and the delivery of plant and equipment.
A range of different factors need to be considered in an overseas construction project, a process that extends from basic planning through to construction and maintenance management.

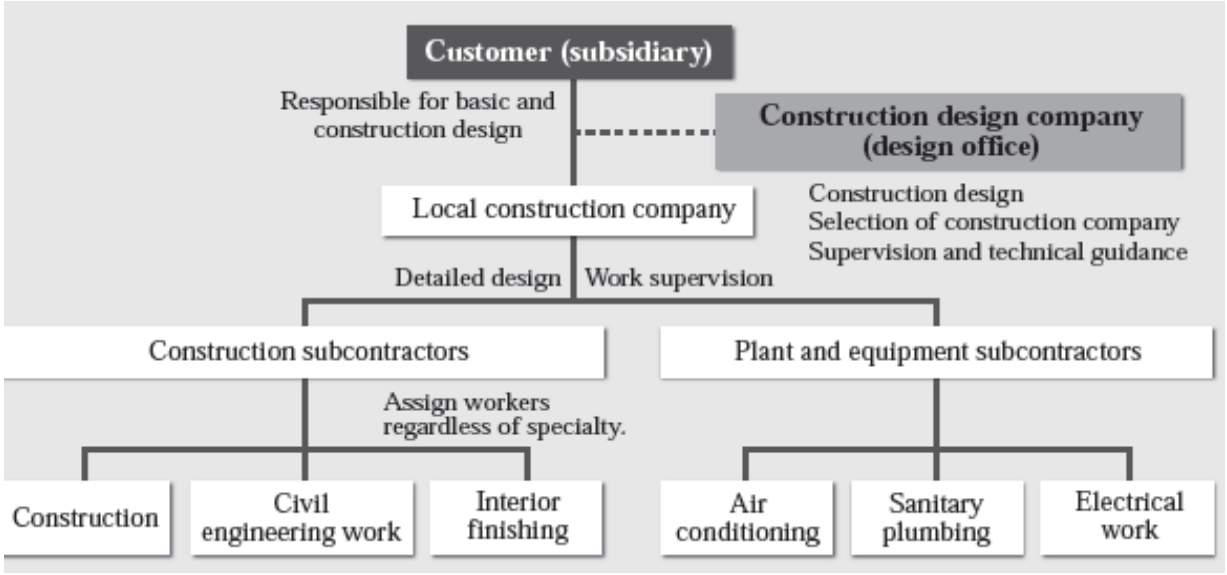


Figure 2.3Organizational Structure Based on Use of Local Companies (Hitachi, 2013)
This example is based on issuing a turnkey contract to a local construction company.These include standards, regulatory consents, and environmental rules. The customer initially considered entering into a turnkey contract with a local construction company in order to minimize construction costs. Under this model the work would be done by subcontractor companies that had a business relationship with the construction company (see Fig. 2.2). However, because of concerns such as the lack of information on quality assurance and similar, the customer decided instead to consider a collaboration with Hitachi.

2.10 **Critical review and gaps**

In the study it given emphasis on developing a well-defined project in a manner that reflects stakeholders' expectations, and accrues the benefits of their contributions, without compromising the purpose of the project. The study says that all stakeholders should have adequate opportunities to have their voice heard so that no element of the project definition is missed during all project lifecycle. Thus there is a need for a project implementation process that takes into account each stakeholder's perspectives and position if conflict is to be mitigated.. This study did not take into consideration changes of project scope during project implementation.

The research talked about project failure factor that may influence the effectiveness of project implementation emphasis on corruption, inadequate skills or lack of professionalism, inadequate planning or design and management as factors that facilitate project failure.

2.11Description of HMMBI and turnkey projects.

Metals and Engineering Corporation /METEC/ was established having its current name and with a newly added responsibilities in June 10,2010 by proclamation number 183/2010 and using six industries found under authority of ministry of defense. One spare parts factory established during Emperor H/Selassie regime and five defense industries which were established by the Derge regime for up grading, overhauling, and producing of military products and logistics to satisfy FDRE defense force. Now METEC has 13 industries and 2 service centers.

Hibret Manufacturing and Machine Building is Located in Addis Ababa, LidetaKifleKetema, Kebele 07, around Mexico Square and it covers an area of 97,025 square meters. This company was established between the agreement of our country and the Czechoslovakian government here at Addis in 1945 E.C at an estimated cost of Birr 2,000,000.00 and invested capital of Birr 2,000,000.00. It was expanded in 1977 E.C with the expense of Birr 82, 000,000.00. The main objective was to produce different types of ammunition of simple bullet, woodwork and metal work, medals and badges, and tools and spare parts.

Before the current name given as Hibret Manufacturing and Machine Building Industry, it was described by different names at different time frame by different groups. The names of the company were: His Majestic H/Silassie Ammunition Factory, Addis Machine Tools Factory, Addis Metal Pressing Enterprise, Tools and Spare Parts of Design and Manufacturing Center, Addis Engineering Center and Hibret Machine Tool Engineering Complex respectively. This organization passed through different situation of administration, Addis Metal Pressings Enterprise was established by the council of ministers Regulation No. 38/1990 in June 19, 1990 E.C by authorized capital of Birr 111,216,000.00 and paid capital of Birr 76,216,000.00 and administered under the development of government organization according to proclamation No. 25/1984. The council ministers of the Federal Democratic Republic of Ethiopia government 101th regular meeting held decision number 2/ms101w284/1996 the Addis Metal Pressing Enterprise completely restructured, and the rights and obligations of the organization will be shifted to Defense minister of the country. This was provoked by the federal NegaritGazeta 11th year No. 39 under the heading council of minister Regulation No. 102/1996. By using this power

Defense takes corrective measures and ordered to transfer the ammunition factory to Hormat Ammunition Engineering Factory. According to this order the main body of the factory i.e. ammunition product equipment, machines, etc were transferred to Hormat Ammunition Engineering Factory. Thus, the remaining workshops in the organization are:

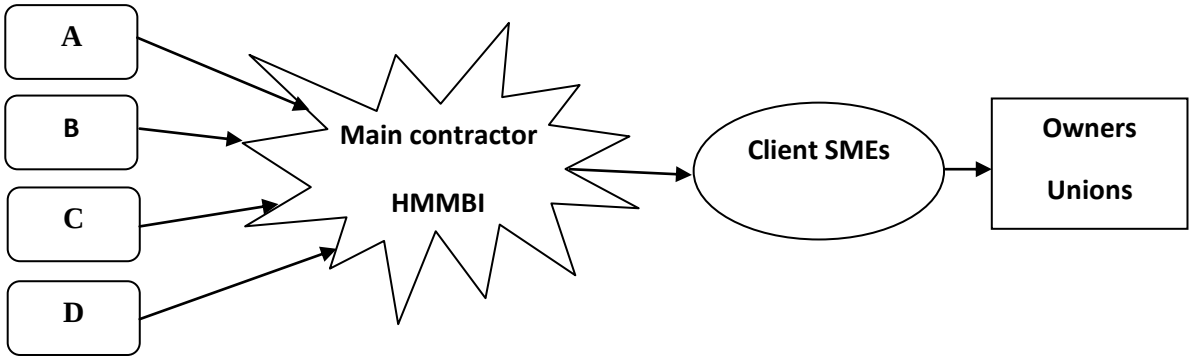
- Tools and Spare parts Workshops (Mechanical workshop)
- Medals and Badges Workshops
- Metal and Product packaging Products (wood work workshop)

The organization was working by the name of "Tools and spare parts of design and manufacturing center" under the Defense Industries Coordination Office starting from the letter written by the country Defense Minister of protocol number "m3/st2/t/1094/96 on the day of April 9, 1997 E.C. Again, the letter was written from Defense Industries Coordination Office protocol numbers "m3/st/2/t/357/97 on the day of November 23, 1997 E.C. decided the name of the organization to be called as Addis Engineering Center. Finally, the Defense Industries Coordination Office decides, since December, 2000 E.C. the company re-structured itself with a new name, Hibret Machine Tool Engineering Complex, by applying new management concepts to add some value to the countries staggering manufacturing industry.

In addition to routine spare part production, the industry is engaged with both in mega projects andestablishment of medium size manufacturing factories projects to enhance the country industry lead economic strategy.

Since, the client needs a complete plant, factory or institution turnkey project is agreed solution. Then the main contractor HMMBI is responsible for marketing, negotiation and setting up of the project plan.While,ithas sub-contractors for some parts of the project described in the following figure below. Themain contractor has to hand over the project to the client and finally to the owners fully operational and working (Cova, 2002) and need to be within the agreed specification and quality level.

Sub-contractors



Where: A for main workshop sub-contractor.

B for café, toilet, guard room and fence sub-contractor.

C for electrical lighting system sub-contractor.

D for training sub-contractor (train owners).

Figure2.4. Turnkey Project key stakeholder's relationship (Cova, 2002)

According to the Ethiopian government strategic plan of transforming the country's agricultural led economy to industry led, a lot of efforts seen to be implemented. One and the firs alternative plan is organization of micro and small (MSEs) enterprises. This industrialization process is continued further to organize medium size manufacturing factories in all regional states of the country and the two city administrations. Metals and engineering corporation (METEC) is established mainly to facilitate this objective and playing the leading role of the industrialization process (METEC yearly, 2005 E.C). This additional mandate of METEC planned to organize such workshops in two different phases, in the first phase to build medium duty and scale workshops and in its second phase heavy duty manufacturing facilities.

2.12 Theproject's facility design and manufacturing in HMMBI

HMMBI is one of the 16 industries found under METEC are established mainly to address FDRE Ministry of Defense spare parts logistics and to address the country's demand under Metals and Engineering Corporation (METEC) to design, build and manufacture industrial machine tools,manufacturing facilities, spare parts and industrial equipment. Popular products of the industry such as Pressing and engraving products, Jigs, fixtures and dies, Bolt. Hibret manufacturing and machine building industry working to achieve its mission of designing, manufacturing, installing & erecting, commissioning, training and finally transferring manufacturing facilities medium scale in the short run and heavy-duty manufacturing workshops in the long run (HMMBI feasibility report, 2014). The production work carried out in assembly shop of machine building factory of HMMBI using its other factories for spare part supply, erecting and installation department, project managers of different regional project management section,contract administration, marketing, the researcher found they have direct contact with the project.

Machineries and equipment production process

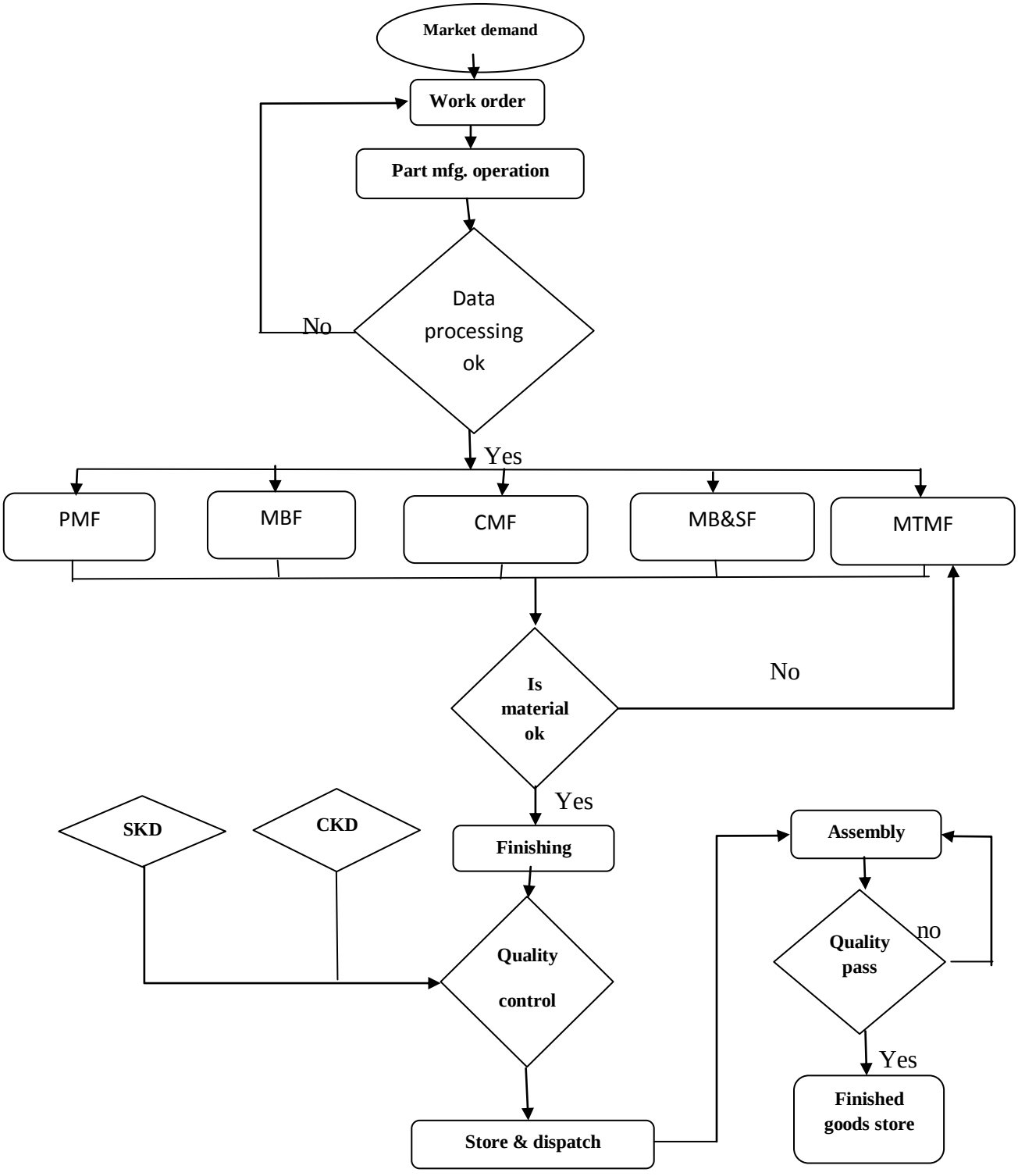


Figure 2.5 Project machineries manufacturing process flow.

HMMBI supply contribution in part manufacturing with own capacity 40%, semi-finished sub assembly(SKD) imported from China which accounts 30% and completed sub assembled parts (CKD)directly importing from China which also accounts 30% of one full machine tool of any type.

2.13 Project implementation procedure

The main objective was to transfer/expand already established its facility and capacity of industries by building other facilities with own potential and people aiming to facilitate spare part production at every region, creating job opportunity for the youth, improving skill, promoting technical capability, and ultimately reaching the market for industrial spare part demand through different phases. The project implementation procedures in HMMBI is.

1. Site leasing, preparation and master plan designing.
2. Machinery erection, installation and commissioning.
3. Production manual preparation and knowledge transfer
4. Training (three months mostly)
5. Sustained raw material supply and technical support
6. Market networking and clustering development

The undergoing results of the industry construction of medium size manufacturing facilities at different regions of the country are identified and shown in the table below.

Table 2.1: Regional flexible manufacturing workshops number and location &TVET.

Region	Towns/college						Total
Tigray	Mekele	Adigrat&Wukro	Maichew	Shere	Axum	Wukro	7
Oromia	Adama	Shashemene	Jimma	Sebeta&D/Zeit	Nekemte	Burayo	7
Amhara	Dessie	D/markos& Bahirdar	Kombolcha	D/brehan	Gondar	Woldia	5
SNNP	w/Sod	Hosahna	Arbaminch	Dilla			5
Addis Ababa	Woyra	Jemo and coca-cola	KilintoandFernsay	Entoto& a/ketema	Nifasilk & CMC	All TVET colleges	7
Dire Dawa	Dire dawa						1
Harari	Harar						1
University	Dilla	Bahirdar	D/markos	Tepi	Woldiya	M/welabo	7
Agri-processing							8
Total							**48**

Source: HMMBI report document, 2017).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1Research Design and approach

3.1.1 Research design

In this research, the overall methods the researcher desired to identify project management practices in HMMBI, factors that affect the implementation of the projects within the predefined scope baselines to the worst case of the project failureand finally to put recommendation forimprovingproject management practices in HMMBI through theoretical underpinning and data analysis of results.A survey method will be followed to explain the results and quantifying the level through descriptive statistics. i.e. the study will use both qualitative and quantitative data. The former is chosen because it is suitable to help identify the nature of the causes of the problems through questionnaire and their consequence, the later helps for quantification of the variables in the study population using percentage.

Therefore,seven sets of stakeholders were selected to participate in the collation of the data. The contractor (METEC/HMMBI), theconsultant(HTH-ENGINEERING), the sub-contractors, the clients (SMEs offices), the unions(owner) members, the financial institution and the general public especially micro and small enterprises engaged with manufacturing and fabrication. The contractor is stakeholder whichis directly involved with the implementation of the project through its project management practitioners based on the nature of the contractual agreement type ‘turnkey’. They will therefore be able to give first-hand information on why the regional flexible medium sized manufacturingworkshop turnkey projects failed.

3.2 Sample size and sampling design

Two sampling methods will be used by the researcher: stratified random sampling and purposive sampling.

1. Stratified random sampling**:** will be used to select appropriate number of respondents from various departments or units. This type of sampling is helpful to the researcher to categorize the population in to subgroups based on suitability.
2. Purposive sampling:this technique will be used by the researcher to question predefined groups which can have relevant information on the subject matter. This

group includes general manager of the industry, head of marketing and sale, operation manager and head of machine building factory, head of PPC department, SMEs office managers contract administration manager coordinators/managers of owners. These people are believed to give unbiased and relevant information on the subject matter.

The research design will be cross-sectional design in which data will be collected from respondents using: -

1. **Semi-structured interview*:*** to gather qualitative data. A purposeful selection was made. This sampling approach uses non-probability sampling techniques. As described (Patton, 2002), in this sampling approach, there is far less emphasis on generalizing from sample to population and therefore greater attention is paid to a sample 'purposely' selected for its potential to yield insight from its illuminative and rich information sources.
2. **Questionnaire:**this uses random sampling, which is a probability sampling technique. The reason for this strategy is that one of the objectives of the research is to find statistical findings to establish which of the failure factors are more important; therefore, a sample was required that could represent the sample population (Bryan, 2012).

In this study, the identified possible project failure factors will be measured and weight determined for each factor then rated to prioritize (relative strength) and answer the research questions. The analysis will be done using percentage comparison for the given factors and stakeholder's analysis methods.

A Flow Chart of Research process (Methodology).

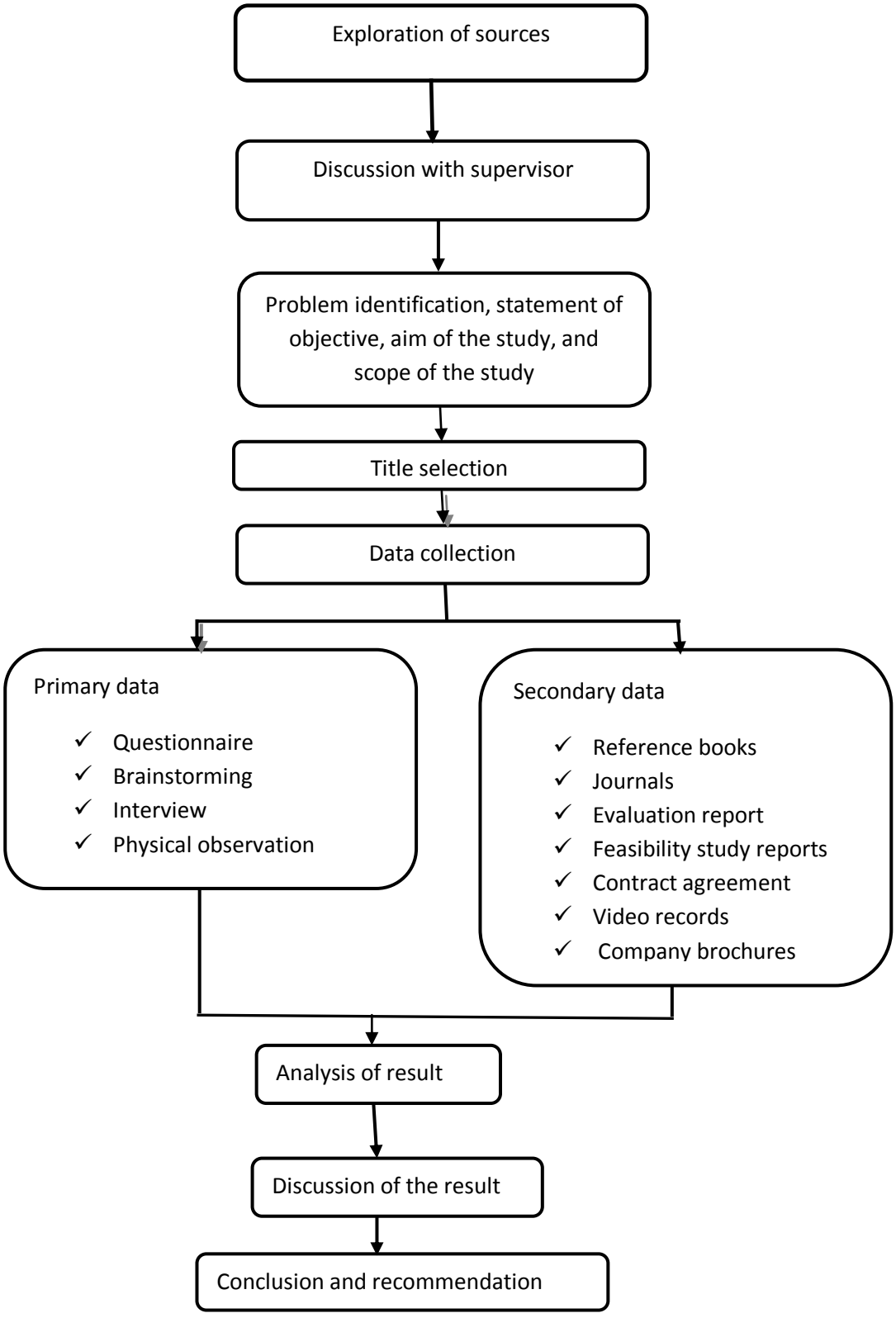


Figure 3.1 Flowchart of the research process.

3.4 Target population and sample

3.3.1 Target population

In this research, the researcher decided to take a total number of7 stakeholders, have direct and indirect influence and participate for the realization of the project. i.e. METEC as corporation contains 16 industries and HMMBI (Hibret Manufacturing and Machine Building Industry) is one which design and manufacture manufacturing machineries and facilities, therefore, this research work starting from METEC's HMMBI which is the main contractor and other stakeholder which are working mainly with HMMBI the consultant constitutes the higher number of respondents the sub-contractors for building construction work, sub-contractor for giving the training, the consultant, project practitioners andother stakeholders regional SMEs offices(client), unions/owners the second higher number of respondents, financial institutions and finally the general public which are beneficiaries of the project. Thus, the researcher has used data gathered from respondents of the mentioned stakeholders taking representative sample of the population respectively. Subsequently, sample respondents were selected using random sampling technique based on the researcher knowledge of which stakeholder more participate in the project implementation and based on the nature of the project type 'turnkey'.They will therefore be able to give first-hand information on how the project activities throughout the project lifecycle and whether or not failed.

3.3.2 **Categories of respondents engaged**

In this study, the study design will adopt data collection by distributing of questionnaires for all participant stakeholders of the project i.e. project contractor, the owner's members of unions, SMEs offices, financial institutions and relevant regional government officials. And interviewing of all responsible authorities from all stakeholders' managers of higher position who are believed to give right answer for the questions.

Below the categories of personnel from different stakeholders engaged in the data collection. Number of respondents in each category, type(s) of engagement and rate of the returns. Out of the 100 questionnaires, 87 were filled and returned. This means 87 % respondent rate.

Table 3.1: Respondent Categories.

Respondent category		Type of engagement	Number	Returned	
Work company	Roles			freq.	percent
Contractor (METEC/HMMBI)	Managers and assigned project managers	Interview	4		
	PM team members	Semi-structured questionnaire	20	18	90%
	Production workers	Semi-structured questionnaire	40	34	85%
Consultant	Designing & monitoring civil work	Interview	1		
Client (SMEs offices)	Office head	Interview	2		
Client (SMEs offices) Managers of the unions	Coordinator of unions	Interview	2		
External evaluators committee	Final evaluation	interview	1		
Members (unions)	Owner	Semi-structured questionnaire	20 (10 each)	19	95%
Public & local businesses	Beneficiaries (workshop owners &	Semi-structured questionnaire	20	16	80%
Financial sources	Micro finances &…	Interview	1 (Harar only)		
Total		Questionnaire	100 from both	87 from all	87%
		Interview	9	8	

Source: - primary data, 2018

3.4 Sample size determination:

Yamane's 1967 formula was adapted to determine the representative sample size for the PMPs and Contractors. The researcher assumed a normal distribution in the responses of all stakeholders in relation to all operational activities throughout the project. Based on the formula, there were 335 registered personnel from all involved parties (N = 335). At an

acceptable 95% level of confidence, there is a statistical z value of 2 (z = 2) and with an error limit of 10%. Adapting Yamane's formula, the required sample for the contractors and concerned stakeholders is determined as:

$$n = \frac{N}{1+N.e^2} = \frac{335}{1+335(0.1)^2} = \frac{335}{1+3.35} = \frac{335}{4.35} = 77$$

Where,

n = required response

e^2 = limit of error

N = sample size

This means that the lowest acceptable number of responses must be 77 at a 95% level of confidence with level of error at 10%. However, to strengthen the validity, the researcher distributed 100 questionnaires to the relevant stakeholders.

3.5 Sample selection procedure

The questionnaire consists ofmore than 60questions. It was distributed to respondents from HMMBI, consultant, sub-contractors for civil work and training, client SMEs officers, owner union members, general public, and financial institutions. In HMMBI the questionnaires distribute specifically for the members of machine building factory Production Planning and Control (PPC), machine assembly line, quality control teams,erection and installation department, contract administration office and marketing departments and to regional project management officers. All the respondents, who are representative of each stakeholder of different departments believe to have knowhow on the issues raised with the researcher asShown in table 4-1 above.

3.6 Data collection methods and tools

The research is conducted mainly on both primary and secondary data. A Structured Questionnaire addresses the respondents from all stakeholders, project management questions of the project life cycle to assess different failure factors in perspective of participants, beneficiaries and managers of different stakeholders.Multiple data gathering techniques used

to collect data from the study area. Thus, Brainstorming, document analysis, questionnaires, structured and unstructured interviews physical observations.

3.7 Data types and sources

3.7.1 Data Type

Using a combination of qualitative and quantitative data can improve an evaluation by ensuring that the limitations of one type of data are balanced by the strengths of another. Thus, mixture of both qualitative and quantitative data will be used to present a more complete and synergistic research analysis.

3.7.2 Data sources

3.7.2.1 Primary data sources

The primary data will be collected randomly from sort of all stake holders using survey questionnaire to assess the level and strengths of the factors. And managers from all parties at different levels will be interviewed to make satisfactory the information required. But initially brainstorming session made to identify probable failure factors conceived with purposely identified group.

3.7.2.2 Secondary data sources

To strengthen the reliability of research data and supplement the information missing in the questioner survey, information will be collected from other related researches, project manager's reports, project self-evaluation reports, external committee reports, contractual agreement documents, feasibility study reports, letters concerning the project, Journals, the company procedure and policy and relevant corporate information videos and brochures.

Brainstorming: Brainstorming session held for problem and possible causes of the problem's identification in the factory. Eight people for the brainstorming session are selected from machine building factory which include head of quality control department,

head of PPC department, head of engineering department, head of assembly workshop, and two senior machine operators.

Document analysis: maintenance and service manuals of different machines and measuring equipment, data record sheets of the rejected and reworked products from the quality control departments are analyzed.

Observations: This type of data collection is anticipated to help the researcher to gather a lot of information through visual judgment like the present conditions of machines, measuring equipment, cutting tools, gigs and fixtures.

Interview: The interviews used to strengthen the ideas collected through questionnaires and observations. The researcher will ask management bodies and respondents who are directly involved with the subject matter.

Questionnaires: Questions will be prepared in dichotomous response format that ask for a Agree/ disagree rating response. In addition to this the questionnaires include an option for the respondent to clarify his/her responses

3.8Data analysis and presentation

3.8.1 Data analysis

In order to achieve its objectives, this study has applied the descriptive research design as it has collected data with a view to describe and analyze the effect of factors in project management for project success (Kothari 2004). A descriptive research is concerned with conditions, practices, structures, differences or relationships that exist, opinions held, processes that are going on or trends that are evident. After collection of data, data was processed to meaningful results. Data processing refers to the transformation of respondent's view into meaning form. Both quantitative and qualitative techniques were used to process and analyze the collected data. Using these techniques, the presentation and organization of findings made it very easy to comprehend and draw conclusions based on findings. The qualitative data was analyzed by setting responses for respondents based of which response that was repeated several times.

3.8.2Data presentation

The research mainly focuses on assessing project implementation practices and factors that hinders the success of regional projects.Which have been implemented during execution on the other hand to suggest system through which these projects are integrated for completion

to give their intended benefits.Once the required data are collected, the major findings will be summarized in their percentage and put in to tables so as to make the analysis easy.

3.9 Ethical Standards and Procedures

In research there are some ethical principles that should be taken into consideration, the principles can be broken down into four major categories according to (Bryman and Bell,2011) as following:

Harm to participants: Any form of harm to participants is unacceptable, whether it is physical, psychological and can affects the participants future career or/and development.

Lack of informed contest: Whether participants in a study knows that they are studied and could thereby refuse to participate. Covert observations usually involve this ethical dilemma.

Invasion of privacy: The right to privacy should not be interfered even though a participant is given informed contest. Whereas certain things can be considered sensitive to the participants and should be respected.

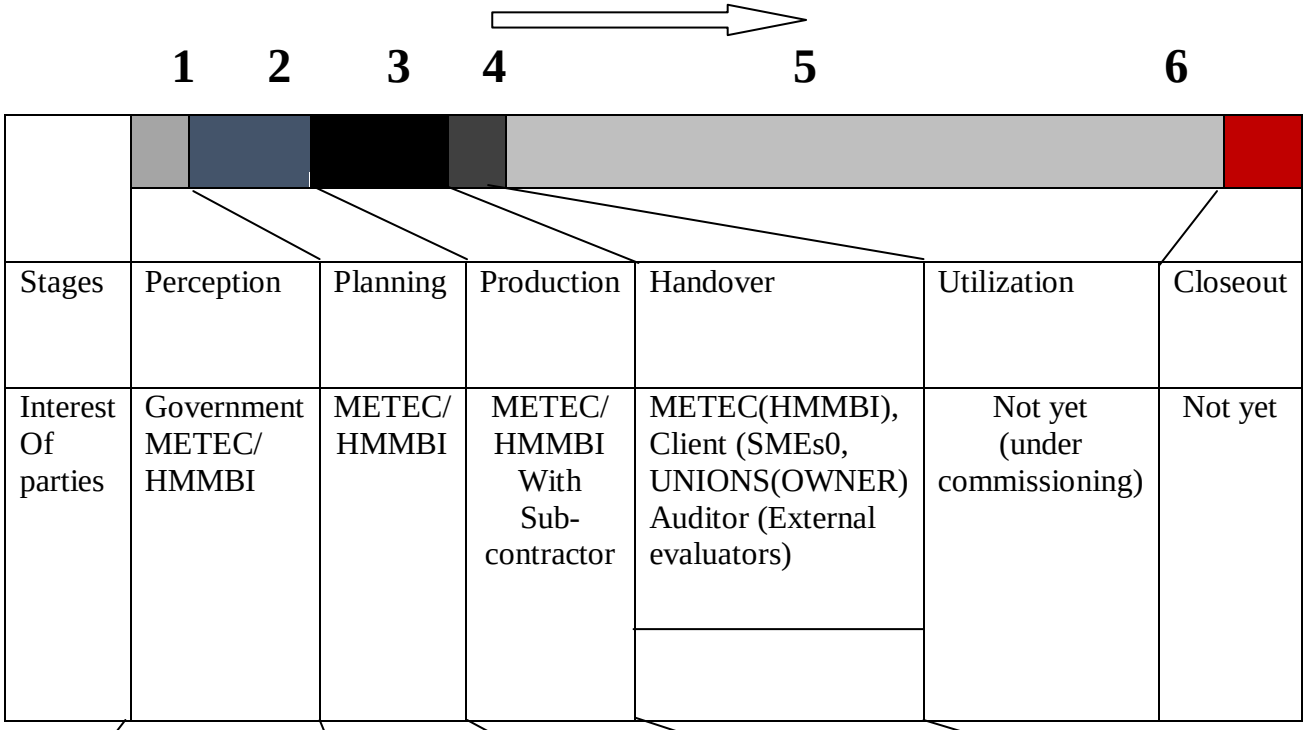
Deception: Whether the researcher represent their research as something other than it is. Some research might want to limit participants understanding in order to get more naturally responds.

CHAPTER FOUR

RESULTS AND DISCUSION

4.1 Project Implementation Progress in HMMBI

Time series of 127 days for planning and production of facilities to termination (March, 2014) started.



(March, 2014)	**(Sept. 2019)**		
Need identification	Conduct analysis	Sub-contracting civil work	Commissioning
Feasibility study	Stakeholders discussion and presentation	Construction	Evaluation
Machinery specification,	Obtain approval for contract	Material procurement preparation	Fulfilling missed accessories
Prepare proposal	Design the facility	Equipment transportation	Request for hand over
Basic Schedule and budget	Site selection	-Installation -Erection	Conflict solving on -cost, quality -specification
Project team	Start training personnel	On process training	Negotiation for the hand overring

Table 4.1 Interest of project parties and their influential participation in the project lifecycle.(Bjeirmi, 1996)

The result shown in the table above found from analysis of responses of interview and secondary data. Since the type of the contract turnkey, most of the responsibility of the project is relied on contractor HMMBI, but most respondents suggest that whatever the type of contract, the project conception and need assessment should have been done with the regional clients SMEs along with the owners and/or the general public interest.

4.2 Performance status of the project

From the secondary data sources, documents and physical observation, it is found that a number of problems on delivered machineries, civil work, electrical installations, and implementation time observed look at in the appendix. Some of the problems shown in the table below

Table 4.2 summary spec. and functionality of deliverables

S.No	Name of departments	No. of required m/c and	Under specification	Non-functional	Accessories notdelivered
1	Part mfg. shop	33	5	7	51
2	Fabrication shop	31	4	5	22
3	Production shop	15	3	5	16
Total		79	12	17	89

Source: Evaluation committee report, 2018.

From the above table one can understand that the external committee identify and reported 15.2% of machineries and equipment found to be under specification, some of 21.5% are not functional and 89 different types of basic accessories did not delivered and the contractor Hibret is not agree on these accessories. The report also shows most of the machineries misses operational and maintenance manuals and most respondents 62 from the questionnaire agreed that the training given was irrelevant and unsatisfactory. Need assessment was not addressed during feasibility study and even though the project started in 2014 E.C to be completed within 6 months, it lags 5 years behind the schedule to cover all its costs according to 4 years of payback period time. The loan interest with 12.5% rate is increasing without production started to generate income and most importantly the disagreement between the two parties, the contractor HMMBI and client SMEs bureau for competing the handover paying the remaining 20% or more than 9,000,000.00 birr. And due to these and unforeseen factors (problems) along with literary definition the researcher found that the project is failed. Any project which is unable to meet its time, cost, and performance and quality levels is said to be failed project

4.3Problem identification and analysis

First to identify and analyze weather the projects are failed or not, then the level of each stakeholder power of influence and authorityover the project, how far the trust and cooperative relationships in between them and then the major factors contributing for the failure, the researcher uses stakeholder's analysis technique. The tool consists of brain storming, data collection, stakeholders power influence andSWOT analysis and Pareto diagrams.

4.3.1Identify the problem

The researcher identifies the major problems through brainstorming. There were three groups used on the same projects. The group used six simple rules for brainstorming: establish relaxed atmosphere, ensure participation by all members, do not criticize ideas, welcome suitable and non-suitable ideas, combine ideas, and recall all ideas. In the first session sevenpeople from HMMBI which include head of regional turnkey projects department, head of PPC department, head of engineering department, head of erection and installation department, supervisor of machine building factory assembly shops and two senior technicians,one general mechanic and one electrician.In the second session there are also two groups of people participates from both Dire-Dawa and Harar tows SMEs officesandusers,two from each group discuss on the major factors which hinders project implementation to be completed within predetermined baselines.

The first group then identifies the following problems.

- Almost all except few assembled with our capacity most of the machineries directly imported from china due to contractor called TEAMS ENGINEERING and attaching our logo, repacking and dispatched to the project sites.
- Fail to meet due date according to the time baseline
- During commissioning most machines especially lathes and millings are broken and arises quality problems
- Some machineries don't have standard accessories
- A significant number of machineries are out of specification
- Incompetent project managers, team, and sob contractors participate in the implementation and unable to coordinate the people withactivities.
- Dishonesty was the major problem among all individuals in the contractor side.

The second two groups also identify the following problems

- There are building design discrepancies the same workshop building designs for all projects throughout all regions with the same bill of quantity, without considering weatherconditions of project sites.
- There are building quality problems heavy cracks both on flor and wall, poor electric line installation, broken pipes, poorly build foundations
- Some machineries are seen old and getting broken during training frequently
- The training given with inexperienced trainers the hinders the technology transfer
- The number of members of the unions decreased and found incompetent with the technology requirements due to poor selection and training.

4.3.2Brain storming for possible failure factors identification

Once the project implementation process problems are known that it is out of control or incapable for success, the next step is to determine the assignable factors for the project failure and their consequences. Then the major assignable failure factors identified during the brainstorming session is held and they are listed as follow.

- Political/governmental interference
- Poor planning and monitoring of activities
- Project funding
- Poor Feasibility study
- Poor time and cost estimation practices
- Emotional contractual agreement
- Change of leadership within all stake holders
- Cultural and ethnical differences seen as recurring problem.
- The training given was not relevant and satisfactory
- Inexperienced trainer and non-inclusive training
- Fair gender distribution among members of the unions
- Wrong selection of owner members
- Trust and cooperative feelings between members of the unions.
- Lack of teamwork (involvement) among stakeholders
- Inexperience of contractor (METEC) for such projects
- Lack of Management support
- Inadequate communication in process tracking.
- Frequent Change in project managers and team.
- Change in government and leadership.

- Improper sub-constructor selection
- Luck of implementation continuity
- Denial of source of equipment.
- Most installed machineries unable to meet quality standard
- Machineries are not within the specification
- Building design discrepancies
- Project Managers/team lack of competence
- Fraud on cost of machineries and.
- Lack of identification of relevant rules and legislation
- Contractual fidelity
- Fear of relationship sustainability
- Conflict resolution gap
- Absence of Trust and cooperative feelings between stakeholders.
- Poor risk management
- Poor quality of briefing process
- Inadequate or misused methods
- Failure to manage expectations
- Poor motivation among staff

4.3.3Problem Selection

After detail discussion with each group, majority of the participants agreed and conclude that, if there were no problems on project management practices among all involving stake holders at all project lifecycle, the project may be completed within the scope and provide the envisaged objectives. In addition,this the group point out that identifying key stake holders with their roles and their power over resources, influence, finally the relationship and trust in between them. To strengthen the information gathered from the brain storming session, the researcher assesses the past data records of the project from the conception stage to the current status of negotiation for closeout.

4.4 Demographic characteristics of the respondence

This section sought to determine the demographic variables of the respondents of all participated stakeholders. The findings are shown as in table.

Table 4.3: demographics characteristics of the respondence.

Sex			Age			Education			Work position			Work place		
Sex category	frequency	percentage	Age category	frequency	percentage	Educational category	frequency	percentage	Position category	frequency	percentage	category	frequency	percentage
Male	68	78.2	<18	-	0	H.School	17	19.5	manager	12	13.7	A/A	37	42.5
			19-34	60	68.9	TVET	52	59.8	Team leader	14	16.3	D/D	27	31
			35-44	5	5.7									
			>45	3	3.4									
Female	19	21.8	<18	-	0	Degree	14	16.1	Technician	35	40.2	Harar	23	26.4
			19-34	17	19.3	Masters	4	4.6	Member, staff	26	29.8	other	-	0
			35-44	2	2.3									
			>45	-	0									
Total	87	100		87	100		87	100		87	100		87	100

Source: - own survey, 2018

From respondent's gender data collected to show the gender disparity of the respondents. The study sought to determine the gender distribution of the respondents in order to establish if there is gender disproportion. From the findings it is indicated that 78.2% were male and 21.8% were female.

From the findings, it was noted that most respondents were between the ages of 19-34 years old, this age bracket was noted to have the highest percentage of 68.9% respondents. From the findings, it can be inferred that some respondents were neutral especially the owners, and

to some extent the client and evaluator committee to know the real production capacity of the contractor toprovide reliable insights relevant to the study.

The study sought to seek the level of education of the respondents. From the responses in the questionnaires it was noted that majority of the respondents 59.8% were TVET diploma level. Even though the number of respondent degree and MSc holders small, they are management personnel, could technically educated and knowledgeable and would therefore provide relevant information on the area of researcher study.

4.5Discussion of results.

4.5.1Analysis of stake holder's authority.

In practice, legitimate power is expressed in a range of types of authority that may vary considerably. This studyconfined here to seven key types of authority in the table below.

Table 4.4: stakeholders' authority over given objectives.

Types of authority	OQ	RS	TR	SP	CI	RSS	CM	TOTAL
METEC/HMMBI	3	3	3	3	3	3	3	21
SMEs office	3	1	3	3	2	3	3	18
Unions	1	1	1	1	2	1	3	10
Consultant	2	1	3	2	3	2	2	15
Sub-contractor	1	3	1	1	1	1	1	9
Financial institution	1	3	2	2	3	2	3	16

Source: -(GTZ format, 2018).

Score 3 denotes strong, score 2 intermediate and score 1 weakauthority.

Where: - OQ- Setting objectives, norms and quality control,

RS - Allocating or denying resources

TR - Defining roles, tasks and responsibilities

SP - Structuring the participation in decision-making processes

CI- Controlling access to information and knowledge

RSS - Allocating rewards, recognition and sanctions

CM- Channeling messages to superiors and external bodies

The result from the interviewers to fill the questionnaire table5.2.it is found that the response showed in the above table that METEC/HMMBI has ranked the first position of authority over the projects by scoring 21 overall points, the second position is hold with SMEs offices scoring 18 point. The result shows that they have right to participate in controlling and monitoring at every stage of the project lifecycle. The third authorized stakeholder is found to be financial institution scoring 16 points, which are participate with suppling 100% loan, for

the sake of their financial health they have also right for monitoring of the project progress. The fourth one,the consultant with 15 points is directly responsible for monitoring and controlling of proper implementation of the project activities with predetermined plan and progressed within the scope. The owner of the project ranked fifth but with a significant authority over the project.

4.5.2Key stakeholder identification

The process of identifying key stakeholders analyzed through interviewing relevant higher-level personnel, who are familiar withthe managerial issue. The interview from different stakeholders' responses collected and analyzed for their position and core functionare then analyzed. These conversations may focuson the following questions: how much is the roles and legitimacy power, resource and responsibility, communication and their involvement.

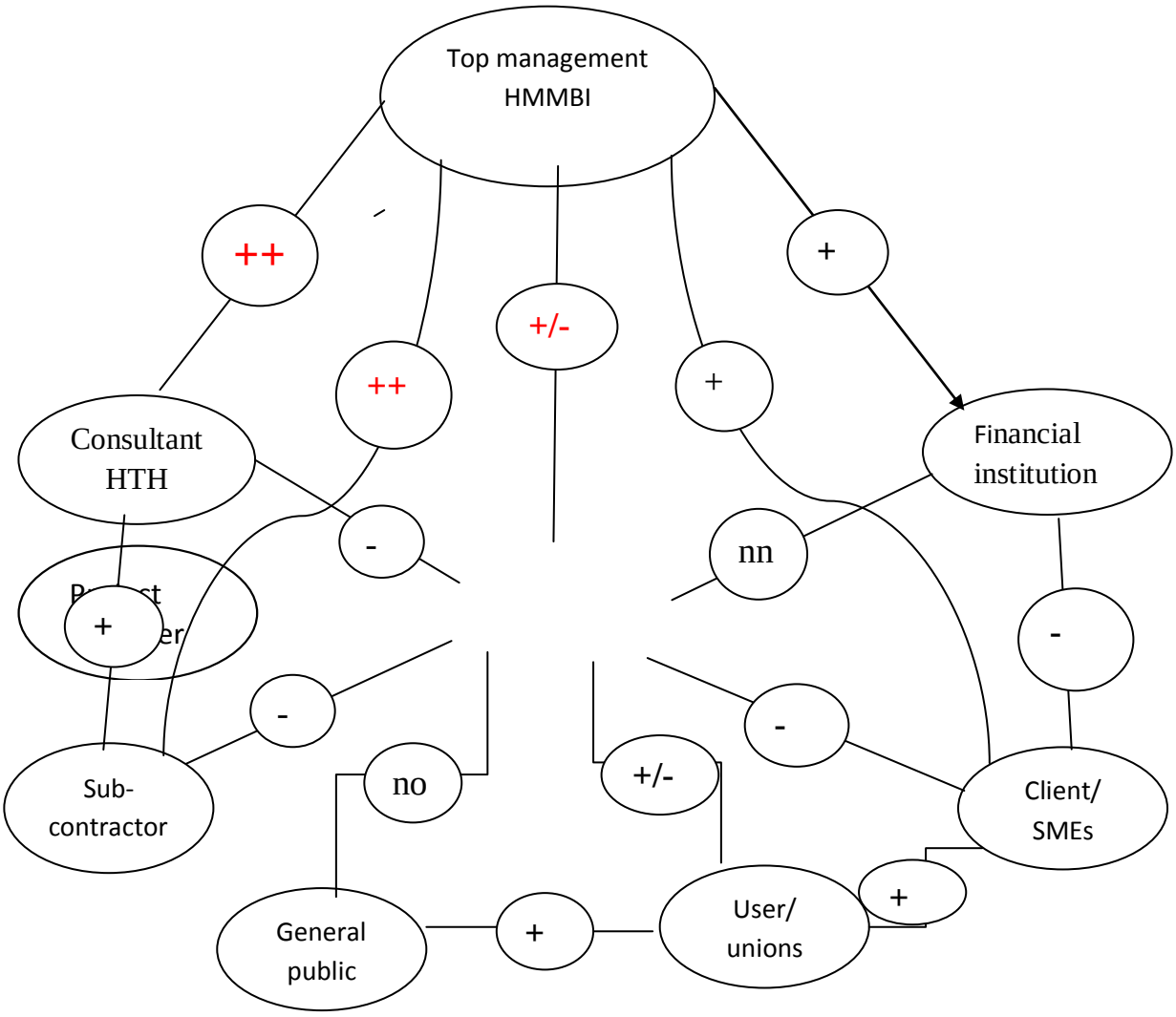
Table 4.5: Identifying key stakeholdersputting the interview results into the matrix.

Potential key stakeholders in relation to the project	Position and core functions of the Stakeholder			Forms of key stakeholder involvement
	Roles and legitimacy	Resources and responsibility	Communication	
METEC	Strong	strong	Strong	contractor
SMEs offices	Strong	Medium	strong	client
Unions	Medium	Weak	Weak	Owners
Consultant	Medium	Medium	Strong	Design and monitoring
Sub-contractors	Weak	Medium	Weak	construction
Financial institutions	Medium	Strong	medium	Source of fund

Source: - (GTZ format, 2017)

Through the process of identification of the key stakeholders, the result of interview presented as shown in the table above and the result shows that the contractor METEC/HMMBI is the first most key stakeholder in its role, responsibility and communication of all parties for the success and failure of the project due the type of contract similarly every resource is under its control. The second key stakeholder is the SMEs offices due to their authority and responsibility to control and evaluate the project at every stage communicating with all contractors. The role of unions with their members for the completeness of the project with acquiring the necessary skills from the training intern capable of utilizing of all the facilities of their factory to produce different products.

4.5.3Project manager influence map.



Where: + (strong), ++ (very strong), - (weak), n (no influence), +- (one directional).
Figure 4.1 Influence a project manager possesseswith different stakeholders.

The Figure5.1 above shows, a simpler version of a power gram, depicting influences personshave on each other as the result of the response of the interviewers on the how power full the project managers over other stakeholder peoples and vice versa to create influence based on their given authority for the successful implementation of the project. This kind of diagram may be well suited to display the interrelationsin a project.

4.5.4 Opinions of respondents

The questionnaire consists of10 Components which further consist of 60 questions to assessfactors which have potentially contribute for the manufacturing workshop project failure. Each question has six alternatives that aid in the improvement of project execution practices, which are put in such a manner that the first alternative shows project management

context within the stakeholders especially the contractor company METEC/HMMBI least project accomplishment performance. For each element described in the questionnaire the respondent was requested to select for the statement that he/she assumes best suitable cause or factor for the failure considering its current status and past conditions of the project.

Each alternatives of the elements of the questionnaire were designed in such a way that it tends to match with the terms: strongly agree,agree, neutral,disagree and strongly disagreebased on the basis of the level to which the element was practiced during the project lifecycle

a) Failures in the Project Management Context

These are sources of failure traceable to the inappropriate "fit" of the project organization to project objectives, project tasks, top management, and the larger environment. They include the use of a project management approach or model that is incorrect for the project objectives and environment, and lack of top management support for the project.

Table 4.6 Failure factors of project management context

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Over estimation of one party and its inappropriate fit for such projects with no past experience		54	26	4	3	-
2	Luck of Governmental involvement in facilitating resources and monitoring the progress.		62	20	5	-	-
3	Unsatisfactory feasibility study		58	22	4	3	
4	Incompatible philosophy and organizational culture of the contractor with project situation.		61	17	9		
5	Poor integration management system with the project environment.		41	13	12	6	15
6	The company does not make policy and procedural changes (budgeting, planning, and control systems, reporting and authority relationship, etc.) needed to conduct effective project management.		34	19	10	11	13
Total		Freq.	310	117	44	23	28
		Percentage	59.4	22.4	8.4	4.4	5.4
		Cum.%	59.4	81.8	90.22	94.62	100

Source: Own survey, January-March, 2019.

In the first section of the questionnaire the respondents were asked whether there is inappropriateness of involved parties in to project management context of the project objective, required agreed tasks, inclusiveness at every stage, considering the larger project environment and whether PM approaches or models correctly used to manage the factors that caused project failure.In this regard, overestimation of one party, the contractor and giving all authority and responsibility without involving other stakeholders to work as a team, the

project performance was rated 61.6% to the largest extent. The rest industry's performance was rated as "No" to a large extent (i.e.70.93%). Similarly, the next largest group of respondents agree that the mentioned factors are reasonably causes for the failure is 21.7%.

The results of interview and other qualitative data also indicated that even there exists a chance of success for the project with a little scope creep, the contractor company METEC has significant problem of capacity, system and manpower utilization in project management context.

Therefore, the project objective mostly seen as political objective then assigning political people to lead the activity using a command type order system due to the nature of the key stakeholder/contractor/ military originated industry. Which leads to misuse of the generated ideas, resources and favorable condition for sustaining the political interests instead of working with other stakeholders for the success of the project.

b) Failures in the Project Management System

These are sources of failure traceable to project leadership, philosophy, and practice. They include the wrong project manager, neglect of the systems approach in the project life cycle, and misuse of project management techniques.

Table 4.7: Factors related to poor project management system

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Luck of team work and communication among operational stakeholders.		55	24	4	4	-
2	Inability of top management yielding adequate responsibility or authority to the project managers, or back the project manager's decisions or actions.		65	9	8	4	1
3	Frequent change of project managers and team		44	21	13	9	
4	Poor conflict resolution system (one directional command way)		36	31	-	12	8
5	Inadequately and misuse of PM tools and techniques		51	26	7	2	1
6	Poorly motivating project staff		49	30	7	-	1
Total		Freq.	300	141	39	31	11
		Percentage	57.47	27	7.47	5.9	2.12
		Cum.%	57.47	84.48	91.95	97.88	100

Source: - Own survey, January-March, 2019.

Participated respondents recommended the following: 57.6% said there was a problem of involving of operational stakeholders the project manager, team and supportive staff and also there were no top management support and motivating of the project staff members, similarly a number of factors which hinders the success of the project within the scope. The next major

percent of respondents about 24.2% also agreed that there is poor project management systems mentioned above. Less significant number of respondents 6.1% and 3.25% of them don't agree that the mentioned factors were not causes for the project failure. Some of 8.83% of the respondent found in between or neutral this result may show that secrecy of the project from the conception to the recent status in that, participant people from all side may not understand which stakeholder took a key role. Even many respondents do not understand the real capacity and experience of the contractor HMMBI but only by overestimating it.

The respondents for interview from the higher-level management said that it is not only the problem of implementing of proper project management system but also the root cause is all participant in the project negotiation for contractual agreement are higher officials who did not familiar with project management and such manufacturing establishment and production systems, so that results shows that the project idea, cost and future benefits are from only METEC side and they accepted as a command.

As this study intended to analyze the contribution of failure factorswhich hinders thesuccess of project, the above discussion shows the better way is to apply proper project management systems in order to achieve the intended success.

c) The project failure due to poorly contract/procurement management system.

The Project contract is useful tool to properly clarify and define the project. The Project contract – sometimes also called the project brief – is one of the early descriptions of a project.The Purposeof a project contract documents the essential elements and aspects of a project in its early stage. It provides a guideline and definition of what needs to be done and achieved. A more detailed version is often called Project Definition Report.

A Procurement specialist (or specialists) is assigned as part of each project team to ensure value improvement from the start of the project life cycle. At every stage specifications and scope of work documents will be reviewed by procurement to maximize market participation, ensuring the clients receive the most cost-effective rates possible.

The time spent in establishingall aspects of the projectdirectly impacts on how welltheproject will be executed.Confirming scope and havingaccurate sign off with theclient is critical in ensuring theproject expectations will bedelivered.

Table 4.8 Failure due to factors of poor project contract management systems.

S.No	Questionnaires	Summarized responses				
		1	2	3	4	5
		Freq.	Freq.	Freq.	Freq.	Freq.
1	Political interference on contract engagement	67	13	-	5	2
2	Emotional contractual agreement	49	22	6	10	-

3	Selection of inexperienced contractor		54	15	11	4	3
4	Shift of Adherence to agreements and contracts		58	29			
5	Luck of identification of relevant contract rules and regulation		38	16	27	4	2
6	Lack of identification of relevant rules and legislation for shifts of original contract entities.		10	15	24	17	21
Total		Freq.	276	110	68	40	28
		Percentage	52.87	21.07	13.1	7.66	5.38
		Cum.%	52.87	73.94	86.96	94.62	100

Source: - Own survey, January-March, 2019.

According to the respondent response, most respondents 52.87% strongly agreed that the contractor company does not implement good project management system, that is one of the factors for the project failure with its political influence to take package of project with higher rate 67 respondents. The second higher number is 21.07% which support the project is failure factor is poor project management system. Some 13.1% found to be neutral because of the nature of the contractor company METEC as a military institution close to public.

d) **The project failures due to bad ethical conditions.**

There will always be ethical issues that arise during the course of a project. Some of these issues may have a bearing on the project, and some will be of little consequence.Issues can arise from within the Project organization and from the environment that impacts the project. Any ethical issues that arise should be evaluated and dealt with as efficiently and effectively as possible.An issue can often linger on, even after it has supposedly been resolved, so it is important to track issues to complete resolution.

Table 4.9 Failures factors of ethical conditions

S.No	Questionnaires	Summarized responses				
		Freq.	Freq.	Freq.	Freq.	Freq.
1	Wrong selection of members of end users	35	19	11	13	9
2	Dishonesty of project team members	25	13	17	29	3
3	Cultural and ethnical differences seen as recurring problems	62	11	8	4	2
4	Top managements lack of commitment to project.	43	27	9	6	2
5	Installed machineries were not designed and manufactured with METEC as popularized	33	16	22	11	5
6	Fraud on procurement process for machineries and accessories on cost, quality& performance	51	17	2	6	11
Total	Freq.	249	103	69	69	32
	Percentage	47.7	19.73	13.22	13.22	6.13
	Cum.%	47.7	67.43	80.64	93.86	100

Source: -Own survey, January-March, 2019.

According to the majority respondents 56.9% it is difficult to avoid the failure due to in-depth of ethical issues at all levels because of there are

High secrecy and lie of the contractor industry METEC/HMMBI to design, produce, and commission all production machineries and equipment make 13.9% of the respondents don't clear for the information but according to responses 56.9% almost all machineries are old, low quality and imported from china and attaching the company logo/trade mark then dispatched to the client's site as if they are designed and produced with METEC/HMMBI consequently significant number of despondences believed that there is fraud on the cost of machineries.

During organizing of the owners, members selection was mainly based on political participation of individuals for their privilege, this in turn creates skill gap and the training more difficult in addition to the trainer being inexperienced and luck of competency.The cadres tried to select members from the major ethnical groups (i.e. in DireDawa city administration mainly from Oromo and Somali including some minority groups and also in Harar from Oromo and Harari youth. Which later creates cultural and ethical problems of luck of trust and cooperative feelings in between for the success and sustainability of the project.

During interview respondents show fear of ethical problem of fraud on cost because Installed machineries are not designed and manufactured by METEC as popularized. Instead purchased and imported using tax exemption process from china. Since the quality of some machineries low and they are second hand, it is important to revise the machinery cost.

Also, during physical observation, the researcher observes that some of the machineries and equipment burnt and broken to damage due to political some says ethnical crises.

e) **Failure factor of incompetency.**

Table 4.10 Failure factors of competencies of all involved among all stakeholders

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Inexperienced of the contractor for such projects		69	13	1	2	3
2	Luck of competency of top managers for project		48	15	15	3	6
3	Luck of competencies of project staff members		41	12	6	9	19
4	Inexperienced of project sub-contractors		39	19	20	3	6
5	Project team luck technical competencies (due to frequent turnover)		44	25	8	7	3
6	Luck of competency of project owner members		29	31	11	9	7
Total		Freq.	270	115	61	33	44
		Percentage	51.72	22.03	11.68	6.32	8.4
		Cum.%	51.72	73.75	85.43	91.75	100

Source: - Own survey, January-March, 2019.

most of 51.72% and 22.03% of the respondents believed that there is a mutual linkage between the project failure and competency of people from all sides of the stakeholders. First of all, the contractor did not been selected with a proper bidding system. As a consequence, incompetent employee of top management got the second higher number of respondents, project managers, project team member and all the factors comprise around75% are probable causes of the project failure. The researcher found, some people are neutral because interviewers answered METEC, the contractor corporation was not understood by citizens. Its promotion was more than its efficiency of actual productive performance.

f) **Failure factors of inadequate communication management.**

Project communication management is the process by which formal communications messages are identified, created, reviewed and communicated within a project that are put during Communications Planning i.e.the process of identifying the type and regularity of information to be provided to all project stakeholders to keep them informed of the progress of the project

Table 4.11 Failure factors of project communication management.

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Frequent change of leaders among stakeholders creates information gap.		59	13	4	11	
2	Inadequate communication in process tracking and reporting of all the major project activities.		31	36	8	9	3
3	Conflict resolution gap during absence of Trust and cooperative feelings between stakeholders for the project requirements of cost, quality, spec. and performance of equipment and quality of training.		32	26	5	7	17
4	Fear of agreed clustering relationship sustainability due to contractor's inability of confronting the ideas raised many times.		33	28	4	10	12
5	Luck of thrust and cooperative feeling on contractor with most of the stakeholders.		61	19	1	2	4
6	Only one directional information & order flow.		39	24	14	3	7
Total		Freq.	255	146	36	43	43
		Percentage	48.85	27.96	6.8	8.23	8.2
		Cum.%	48.85	76.82	83.71	91.8	100

Source: - Own survey, January-March, 2019.

Most respondents 48.85% notice that, one of the project failure factors was poor communication among project practitioners and between project stakeholders with the higher rate of frequent changing of leaders of different direct concerned stakeholders. The next higher percentage is 27.96% agreed that there were no good project communication management practices. During interview most of the respondents from other than the

contractor industry there were information gap during all project implementation periods and this make difficult to owner union members to stay as membership and take required training.

g) Failure factor of project initiation.

At the start of any project, there will be a variety of ideas and opinions about the purpose and scope of the project, what the final product of the project will be, and how the project will be carried out. The Project Initiation Stage is concerned with taking these ideas and intentions and developing them into a formal, planned, resourced and funded project.

In order to define a project in this way, it is first necessary to clearly and explicitly define what the project is intended to achieve and what its scope of interest will be. By defining this first, a benchmark is created for assessing the quality of what is actually produced at the end of the project.

Finally, in order to establish a resourced and funded project, it is necessary to establish a clear and convincing business case for the project. This business case should be reviewed, and hopefully accepted by management of all sides. The business case will identify the projected benefits of meeting the objectives of the project, and balance these against the costs and risks associated with realizing these benefits. The business case can also be used as a benchmark to compare against actual results, costs and benefits in order to assess the ultimate success of the project.

Table 4.12 Failure factors of poor initiation process.

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	All stakeholders did not equally conceptualize the project idea		69	13	1	1	3
2	Poor quality of need assessment and briefing process only at strategic level.		19	31	18	13	6
3	Command type project acceptance for client		27	19	13	22	6
4	Poor feasibility study conducted without prefeasibility study		42	14	8	12	11
5	Project cost over estimation (on all cost entity)		31	24	2	18	12
6	Conducting the feasibility study without client involvement		43	35	6	3	
Total		Freq.	231	136	48	69	38
		Percentage	44.25	26.05	9.19	13.21	7.27
		Cum.%	44.25	70.3	79.49	92.72	100

Source: - Own survey, January-March, 2019.

In the section of the questionnaire respondents, a fair higher number of responses showed that there were problem of project initiation 44.25% without and significant number of respondents 26.05% also agreed that there were problem of consensus on conceptualizing theproject idea besides of its importance with all stakeholders specially the client and due to

poorly pre-feasibility study, the project cost become over estimated. second hand machineries are found

According to response of most interview Top managers from the clients' side complaining that they did have industrial knowhow to negotiate on project cost, number & type of machineries, type of contractual agreement. Since all activities had political intention, there were no way to resist and negotiate. Majority of respondents from the table above agreed strongly that the contractor is incompatible for such project regarding to its being inexperienced and incompetency of its staff members.

According to the response from the interview, this project started without conducting need assessment. Which left a number of issues to be raised like redundancy of machineries especially lathe and milling machines, some machines under specification relative to the market demanded works for example shearing and bending machines limited to work only up to 6 mm thickness but the market demands more, and the type of machineries need to include special machines for auto spare parts maintenance e.g. crank shaft lathe which is important both to solve the societal problem and also best source of income for the enterprises.

h) **Failure factors for poor planning.**

Planning of project details preparing in advance, management reacts to things as they occur. Although poor project planning by itself is a major reported source of project failure, also cited are three particular features of planning—definition, estimating, and scheduling.

An important step in this planning is to identify the required roles and responsibilities of each stakeholder involved.

Table 4.13 Failure factors of poor planning.

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Poor planning of resources		43	28	8	5	3
2	Unrealistic time and cost estimation		55	23	1	5	3
3	Multi-disciplinary technical competency of trainee not considered well during selection.		31	24	4	17	11
4	Failure to manage expectations (risk)		34	32	12	3	6
5	Installed machineries were not designed and manufactured with METEC as popularized		32	20	29	2	4
6	Building design and wire installation are not planned sufficiently (the same design for all climatic areas)		57	17	13		
Total		Freq.	252	144	67	32	27
		Percentage	48.27	27.58	12.83	6.13	5.18
		Cum.%	48.27	75.85	88.68	94.81	100

Source: - Own survey, January-March, 2019.

In this section of the questionnaire the respondents asked whether poor planning of the project was one factor for the failure, majority of the respondents i.e. 48.27% strongly agreed followed by 27.58% rate shows that failure occurred due poorly planning of resources, unrealistic time and cost and unable to state the project plan associated risks, properly like economic depression, change in government, political shift and missing of logistics during transportation as a result some interviewer respond different stakeholders started rising a lot of issues on the drawback of the projects and ask for revision on cost, quality and specification of tools machineries and equipment.

According to interview results there are design discrepancies observed, the same design and building costs set at different regions of different environmental climatic conditions, as a result the actual design difficult for hot environment to operate and become source of conflict for hand overring.Also, according to the evaluation committee report they insultingly told that there is negligence of installation of underground wiring that connects machineries with high voltage is poorly buried, exposed for breakdown and difficult for maintenance even the cable trench did not show on the master drawing. This shows negligence of top management people from all involved stakeholders and mainly the consultant.

The researcher observed that there was gap to support the planning process with professional project managers, engineers and technicians as a result of poor planning the factors mentioned in the above table become cause for the failure.

i) Failure factors for project implementation.

From initial concept and design engineering to production of full working drawings, workshop manufacturing, site installation and finally to start up commissioning, this process is an integrated and complete activity. Throughout the project team need to be experienced and committed and provides full project management system and also apply best-practice of total quality control at all stages. A Procurement specialist (or specialists) is assigned as part of each project team to ensure value improvement from the start of the project life cycle. At every stage specifications and scope of work documents will be reviewed by procurement to maximize market participation, ensuring the clients receive the most cost-effective rates possible.

Table 4.14 Failure factors of implementation process.

S.No	Questionnaires	Summarized responses				
		1	2	3	4	5
		Freq.	Freq.	Freq.	Freq.	Freq.
1	Frequent change of leadership among all stakeholders	42	40	2	3	

2	Irrelevant and unsatisfactory training given with inexperienced trainer		37	25	20	1	4
3	Frequent machine breakdown at commissioning		41	19	23	1	3
4	Luck of implementation continuity due to improperly managing the projectmachinery procurement		65	12	8	2	
5	Inability of stakeholders monitoring, control the progress, inspect delivered materials and reviewing the project plan		41	33	10	2	1
6	Poorly motivating of project staff		46	18	15	7	1
Total		Freq.	272	147	78	16	9
		Percentage	52.1	28.16	14.94	3.1	1.73
		Cum.%	52.1	80.26	95.2	98.26	100

Source; -Own survey, January-March, 2019.

The result presented in the above table shows that all the factors mentioned for the project failure contribution have strongly agreed with most of the respondence. The majority of the respondents answered that listed out factor's constituents the higher percentage of 52.1% followed by 28.16% to confirm the problem. There was also poor training with in operation stakeholders, which almost agreed with the greatest number of respondents 37. The frequency of change of leadership on project managers favors the failure along with project activity and supply continuity problem. Few respondents about 4.83% collectively found disagreed with the factors that to be reason for the project failure that is because they understand the contractor METEC having better production facility regardless of its past experience.

Most interviewers answered that the training given mainly with inexperienced and irrelevant sub-contractor at both Dire-dawa and Harar project sites. This creates poor confidence on the trainee. Due to problem of transparent procurement process of machineries and equipment the continuity of project implementation highly affected. During installation and commissioning the a significant number of machineries found with functionality problem also during physical observation the researcher found that some of the machineries are second hand and with broken or missed internal parts, the project staff poorly motivated due to lowest wage rate of the corporation and they did not work in a coordinated manner with their central command.

j) The failure factor of poor project closeout/ termination process.

Properly planed project closeout process valuably used to support professional engineers, project managers and project teams by employingspecialist commissioning engineers and technicians. Theexperience in trouble shooting of faults and dealing with the complex issues of mechanical, electrical and control interfaces along with proper contract rules and

regulation and lesson learned for future project initiation will be used for terminating projects safely.

Table 4.15 failure factors of project closeout process

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Project contracts and liabilities are not properly closed out		10	21	31	16	9
2	Project terminal report preparation not started and communicated to stakeholders to be used as future project initiation		27	45	6	7	2
3	Appropriate terminal evaluation is not made sufficiently to measure the deliverables against the plan failure of machineries during commissioning.		14	17	3	37	16
4	Fear of existence of the contractor METEC in the market by the client for the sustainability of relation		66	12	3	6	
5	Inadequate communication in process of conflict resolution due to deviation of deliverables from planned quality, specification and completeness of machineries and equipment.		45	34	3	4	1
6	Full of secrecy and poorly motivating of involving stakeholders for proper performance evaluation and project closeout process		51	25	4	2	5
Total		Freq.	213	154	50	72	33
		Percentage	40.8	29.5	9.57	13.79	6.33
		Cum.%	40.8	70.3	79.87	93.66	100

Source: -Own survey, January-March, 2019.

A large number of despondences answered that there are contractors' secrets of fraud on machineries quality and spec. in turn to cost and most valuably denial of producing all machineries and equipment with own capacity and man power40.8% and 29.5%. This results in METEC/HMMBI negotiated to close the project in rush promising to solve raised issues in the future without appropriate terminal evaluation plan and report.

According to the responses from interviewers there was no jointly performed monitoring activity with the two highly concerned parties due to the type of contract turnkey, the client abstains from monitoring the progress and evaluate problem signals at early stage to amend the contract or negotiate on deviated issues from the initial agreed quality and specification of building, machineries, machine accessories, equipment and given training finally sustainability of market and raw material supply. Due to the shift of power of authority and political interferences make other stakeholder to terminate the project closing out process and negotiate for unmet issues.

During observation the researcher identifies a number of performance gaps due to the mentioned factors in the table above, which are causes for the failure of the project.

4.6Evaluation of the factors of failures by using Pareto Analysis

To analyze and point out the major factors which account for the delay and failures on the flexible work shop establishment project, the researcher has taken the average of the ratings of "strongly agreed" and "agreed "of the assessed factors. In this regard it is assumed and the researcher believed that these areas need more attention and focus and correction action need to be taken in order to enhance the project activities. every process from the very beginning of the pre planning stage to the end control and evaluationfor closing out stage.

Based on this the results of the summarized responses which show the rating ratings **"strongly agreed"** and **"agreed "**and the cumulative percentage displayed below**.**

Table 4.16Summarized responses which show the ratings "strongly agreed" and"agreed "and their cumulative percentage.

S/No	Factors	Rating		Average rating	Percentage of overall total	Cumulative percentage
		Strongly agreed	Agreed			
1	Project management context	310	117	213.5	10.9	10.9
2	Project management system	300	141	220.5	11.27	22.17
3	Project contract management	276	110	193	9.86	32.03
4	Project ethical condition	249	103	176	8.99	41.03
5	Luck of project competency	270	115	192.5	9.84	50.87
6	Poor communication	255	146	200.5	10.25	61.12
7	Project initiation process	231	136	183.5	9.38	70.5
8	Project planning process	252	144	183.5	9.38	79.88
9	Project implementation process	272	147	209.5	10.71	90.59
10	Project closeout process	213	154	183.5	9.38	**100**
Total				**1,956**	**100**	

Source: - Own survey, January-March, 2019.

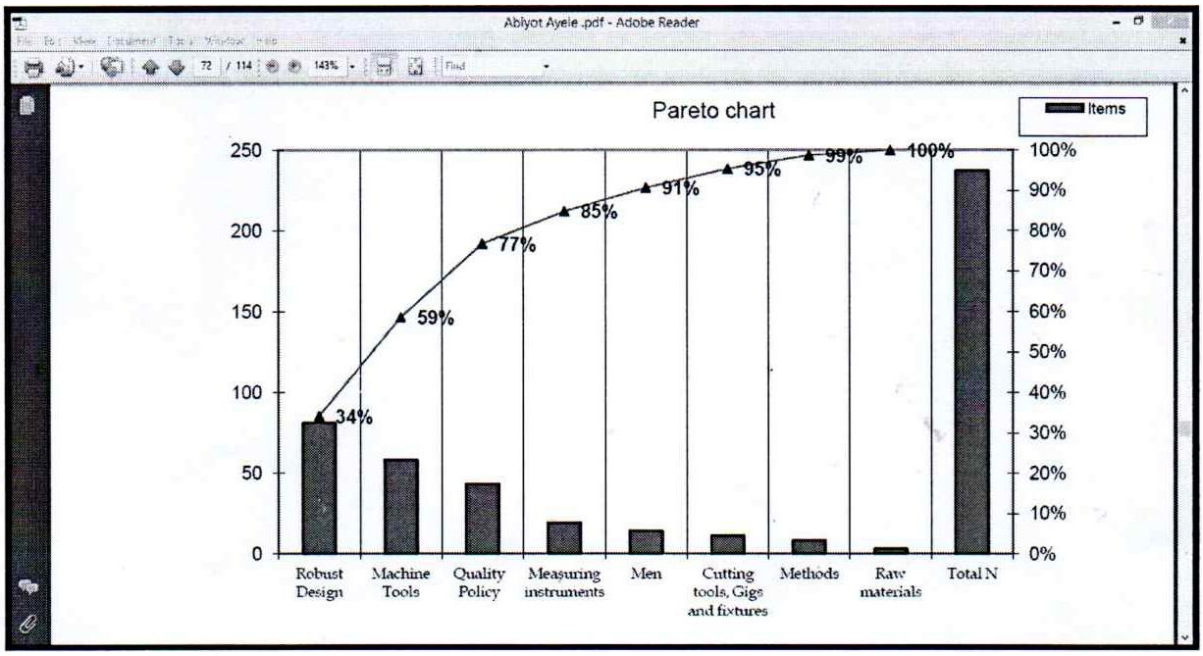


Figure 4.2 Pareto chart from own survey, January-March, 2019.

The above Pareto diagram shows different factors that are potentially promote the project failure. But many the factors that contribute for the failure are poor project management system the contractor industry uses (11.27%) and the contractor's project management rules and procedures, which is rated 10.9%. project planning process also has rated to 9.38%.similar to seen from the interview responses,these questionnaire result shows that all described major factors are almost equally affect the project chance of success. And as the result the problem of the project is definitely relied on that the contractor company did not know about project management philosophy, misunderstanding of project management as a discipline to facilitates positively accomplishing different types of project and unable to use project management tools and technics for the success of completion instead of military command system.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This research revealed that even though the project idea at a conception stage generated with METEC, interviewers agreed that the idea was very relevant and timely with the countries industry led strategic plan to promote industrialization to create job opportunity for the citizens and to minimize import of industrial spare parts instead to generate foreign currency from the sector by exporting different types of products in the near future and to the ultimate goal of establishing the same medium scale and heavy duty manufacturing workshops phase by phase. METEC/HMMBI hugely involved in the sector in addition to its ceased mega projects involvement with under average overall performance of project management practices and no past experience. There are a number of internal practices which are inherited from its background military origin, one-way information flow i.e.commands type leadership which dominates the industrial culture and behaviors, which paralyzes medium and lower level technical managers to criticize unrealistic plans and poor performances of facilities. There are also external factors such as highly governmental support with political intentions, is the reason of over domination of the public media and seizing almost all industrial projects without any convincing experience,from R&D projects, regional medium sizes flexiblemanufacturing turnkey projects to mega projects to be failed. The main factors that contribute for the failure of these projects are identified to be first, the type of the contract "turnkey", which gives almost the whole project activities to the contractor METEC's HMMBI,without proper bidding system and evaluation of its past experience/capability. Secondly, an inappropriate project management approach of the contractor due to the nature of the management which is military personnel led corporation and industries that may cause project systemic features to be ignored, the wrong project manager to be chosen based on their military rank and to the worst ethnical relations to keep economic privileges, instead of their competencies to apply basicproject management practices. Misuse of project management tools and techniques, in turn, lead to poor communication, inadequate definition and scheduling of the project activities and similarly other problems in planning and controlling of project activities. The research result shows that a problem at higher levels to be unsupportive top management and poor communication with all relevant stakeholders increases the chance of project failure, even when there are no problems of production facility and finance.For example, strong user involvement or good planning alone are

probably not enough to prevent failure, if the project manager is unskilled or academically poor leader,the failure may be inevitable. Similarly, even an exceptional project manager will have trouble preventing failure, if top management does not support the project staff. Thus, there is good reason for strong emphasis to be given, generally, correct action at the higher(management) level helps eliminate or mitigate problems at lower levels. For example, using the appropriate project management model and having top management support tends to encourage (or mitigate) the problems of selecting the right project manager, using the structured systems approach, and using the right management tools and techniques; these, in turn, tend to mitigate problems and reduce sources of failure further down in the planning and control process. There is dominant problem of the industry, frequently changing of project staff due to higher rate of employee turnover for the sake of better wage, which makes difficult retaining of experienced technical staffs. As a result, project team exposed to commit a number of ethical faults, such as detaching of necessary machinery assembly manuals pages wishing to be expert for that particular work, to elongate his/her field work time earning more money,

The caveat is that while eliminating sources of failure at higher levels tends to reduce failure at lower levels, the precaution does not guarantee success. Given the uncertainty of projects, causes for failure can develop at any level at any time. Management must continuously monitor and address all failure risks and new problem andneed to be found with this orientation.

The project implementation for the formal and proper closeout process should be on time. If the process takes too long, opportunities are missed and current problems continued.

The findings of this research also revealed that the country has industrial facilityhugely possessed with METEC, without strong organizational structure and organizational behavior that enables successful implementation of very large number of projects even though there are suitable industrial facilities.

Avoiding misuse of systematic procedures for the regular monitoring & evaluation of programs & projects along with commitmentwill lead as encouraging performance. This allows the organization to learn from its experience and maintain the learning for future improved performance of project management practices.

The organization has a very strong financial and infrastructural base that allows to realize the objective of establishing envisaged manufacturing workshops.

The finding of this research has revealed that an observable weakness, many of the points raised. However, the following points are seen as a major weakness on the project.
There are a very weak organizational systems and procedures that enable successful management of its numerous projects.

The organization's effort to retain and motivate its project staff is considerably lowmuch which results a higher rate of staff turnover this intern exposed the project activities delay and poorly performed.

The top management is unsupportive and does not involve other project staff such as project managers, project staff and line managers in the project's conception, feasibility studying activities, planning for technological sourcing and ultimately decision-making during all project lifecycle activities. This results in higher corruption, fraud for cost and pretended as if the contractor design and produces all machineries and equipment but the reality from interviewer reviled that METEC import it and label its logo plate to cheat the client but the machineries found to be second hand, low quality and cheap in price. All the project coordinators were forced to convince the client, evaluation committee and any academical visitors, that everything produced with own capacity and facility locally.

Lack of appropriate tracking system for the price of project resource and service requirements among all stakeholders. The lack of this practice has resulted a significant cost variation of goods and services procured for the project implementation.

Lack of participatory project planning process in the organization. This has been evidenced in the research that there is a clear difference of assumptions of the planning team and the actions by theimplementing team. This also could be the result of lack of accountability between the two team for the discrepancies that are observed after implementation of the project which needs to be further studied.
There is no highly skilled manpower in the organization due to higher rate of turnover and without experience of designing, planning, implementing and closing various types of projects in different environmental, political, financial situations. This enables the organization to have knowledge of different project situations for future success.

5.2 Recommendation

The following recommendations are made based on the findings and conclusions of the study.

Decreased staff recognition and engagement – contractor needs to develop a staff engagement and recognition policies and procedures to timely build the capacity of its project staff and leadership, acknowledge best performance, and develop accountability for possible deviations or poor performance that accounts to the poor performance of the project.

Management Support- Successful project management requires the buy in from top management. There should be in intentional effort and readiness from the leadership both at top organizational level and at every steps of the project management hierarchy so that decision and support can easily be accessible for project staff at any stage of the project life cycle management.

Intentionality and inclusion during the planning process- successful project planning and implementation requires every member of the project stakeholder to intentionally contribute towards to the success of the project. This also requires active engagement of members in terms of sharing of knowledge and acting on possible risks and challenges. Therefore, it is important that there should be a culture of engaging staff with different experience and skills of both from the planning and implementing side of the organization.

Improve the cost tracking system of materials and services – effective cost tracking of materials and services based on trend analysis, market survey and projections greatly increase the performance of the organization in terms of managing projects within their planned budget.Cost estimation of resources and services need to be checked from time to time and such information should be readily available for both the project designing/planning as well as implementing team.

Benchmarking similar agencies-HMMBI of METC local corporation of Ethiopia, it should make assessment of similar organizations from internal and foreign countries and learn from their best project management practices against its observed weaknesses.

The industry needs to support its professionalengineers and project teams,sometimesit should employspecialistcommissioning engineers andtechnicians for experience sharing. Asa result, its engineers and technicians becomeexperienced in trouble shootingfaults and dealing with thecomplex issues of mechanical,electrical and control interfacesencountered on the medium-scaleindustrial projectsundertake.The research has revealed that there are opportunities of using its internal resources and skill to further study its strength and weakness for better management of future projects.

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APPENDES

Appendix-A: Research Schedule

Phase I

S/N	Activity	September				October				November				December				January				February			
		weeks				weeks				weeks				weeks											
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Project title selection																								
2	Title submission for approval																								
3	Presentation of the Proposal orientation for thesis I registered students																								
4	Submission of final Proposal for advisor and student support office																								
5	Literature survey																								
6	Submission data collection instruments																								
7	Refining the instrument based on feedback																								
8	Draft report preparation																								
9	Draft report submission																								

Phase II

S/N	Activity	Duration	February				March				April				May				June			
			Weeks				weeks				weeks				weeks				weeks			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Data collection																					
	Wiring analysis and interpretation of results																					
2	Submission of Draft report to advisor																					
3	Writing of final report version of the research repot																					
4	Submitting Final research paper signed by advisor																					
5	Thesis defense																					

Appendix-B: Research Budget

In order to conduct this research,work it is important to design resource requirements in terms of time spent and financial resource that are committed in monetary value. In the process of data collection and preparation of the paper, there are costs related to transportation, information gathering, stationery materials, questionnaire administration and field works. Therefore, detailed list of budget cost is presented in the table below:

No	**Item**	**Unit of Measurement**	**Qty.**	**Unit Price (Birr)**	**Total Cost (Birr)**
1	Stationary for Questionnaires	Pad/piece	2		1,200.00
2	Stationary for the thesis	Pad/Piece	12		700.00
3	Transportation & Travel cost	Trip/km	3	500	1500.00
4	Training and entertainment costs	-	2	500	1,000.00
5	Payment for data collection	-	-		800.00
6	Miscellaneous Expense	-	-	-	1,500.00
7	Refreshment for questionnaire respondents	-	-		1,000.00
Total Cost					**7700.00**

APPENDIX -C: Demographics information

Date: -…….

Please tick (√) as appropriate

1. Age:<18 ☐ , 19-34 ☐, 35-44 ☐, >45 ☐
2. Sex: Male, ☐Female ☐
3. Region(place) where you live(tick the corresponding)

   Addis Ababa, ☐DireDawa, ☐Harar ☐
4. What is your highest educational qualification or nearest equivalent?

   (a) High school (b) ☐VET(10^{+})☐(c) Bachelordegree ☐(d)Master's degree ☐(e) Professional qualification ☐

   (f) PhD ☐(g) Others ☐
5. What is your level of position at work?

   (a)Manager ☐ (b) Team leader ☐ (c) Technician ☐

   (d) quality officer ☐
6. Which of these categories best describe you? (Please circle only 1)

   (i) Contractor (ii) PM practitioner (iii) General public(V) production worker (vi) owner (vii) external evaluator
7. How many years of work experience do you have? .....
8. Which field of study/ies you are completed/trained/professional? ……

   (i) business (ii) Manufacturing (iii) Construction (iv) Service (v) Agriculture (vi) Mining (vii) Others (Please specify)……

Appendix -D: Questionnaire

St. Mary's university school of graduate studies

Department of Project Management

Introduction

Thank you in advance for your voluntary participation in completion of this questionnaire.

I am doing thesis on "assessment on of factors contributing for the failure of regional turn-key flexible manufacturing projects: THE CASE OF METEC/HMMBI, HARAR AND DIRE-DAWA CITIES SMEs OFFICESS".

The purpose of this questionnaire is to gather information about the REGIONAL MEDIUMSIZE FLEXIBLE MANUFACTURING WORKSHOPS PROJECTS IMPLEMENTATION AND REASONS FOR ITS FAILUREand to recommend for the successful project close out.

Your contribution and honest responses are very important in the study and will help gain better understanding on how to improve PROJECT IMPLEMENTATION CAPABILITIES OF PROJECTS. Your response will only be used for research purpose.

Section I:Questionnaire

Factors of that potentially contribute for project failure on the Harar and Dire-Dawa flexible turnkey manufacturing workshop building projects.

The question

To what extent do you agree that the following statements of factors contribute for the failure of the projects (Please tick (√).

(Numbers denote that: 1= strongly agree, 2= agree, 3= neutral, 4= disagree, 5= strongly disagree)

1. Failures factors due to Project Management Context.

S.No	Questionnaires	Summarized responses				
		1	2	3	4	5
		Freq.	Freq.	Freq.	Freq.	Freq.
1	Over estimation of one party and its inappropriate fit for such projects.					
2	Luck of Governmental involvement in facilitating resources and monitoring the progress.					
3	Unsatisfactory feasibility study					
4	Incompatible philosophy and organizational culture of the contractor with project situation.					
5	Poor integration management system with the project environment.					
6	The company does not make policy and procedural					

	changes (budgeting, planning, and control systems, reporting and authority relationship, etc.) needed to conduct effective project management.						
Total		Freq.					
		Percentage					
		Cum.%					

2. Failures factors due to Project Management System

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Luck of team work and communication among operational stakeholders.						
2	Inability of top management yielding adequate responsibility or authority to the project managers, or back the project manager's decisions or actions.						
3	Frequent change of project managers and team						
4	Poor conflict resolution system (command way)						
5	Inadequately and misuse of PM tools and techniques						
6	Poorly motivating project staff						
Total		Freq.					
		Percentage					
		Cum.%					

3. Failure factorsdue to poor contract management.

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Political interference contract engagement						
2	Emotional contractual agreement						
3	Selection of inexperienced contractor						
4	Shift of Adherence to agreements and contracts						
5	Luck of identification of relevant contract rules and regulation						
6	Lack of identification of relevant rules and legislation for shifts of original contract entities.						
Total		Freq.					
		Percentage					
		Cum.%					

4. Failure factors due to ethical condition.

S.No	Questionnaires	Summarized responses				
		Freq.	Freq.	Freq.	Freq.	Freq.
1	Wrong selection of members of end users					
2	Dishonesty of project team members					
3	Cultural and ethnical differences seen as recurring problems					
4	Top management lack of commitment to project.					

5	Installed machineries were not designed and manufactured with METEC as popularized						
6	Fraud on procurement process for machineries and accessories						
Total		Freq.					
		Percentage					
		Cum.%					

1. Failure factor of luck of Competence among all parties.

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Inexperienced of the contractor for such projects						
2	Luck of competency of top managers for project						
3	Luck of competencies of project staff members						
4	Inexperienced of project sub-contractors						
5	Project team luck technical competencies (due to frequent turnover)						
6	Luck of competency of project owner members						
Total		Freq.					
		Percentage					
		Cum.%					

6. Failure factors of poorcommunication

S.No	Questionnaires	Summarized responses				
		1	2	3	4	5
		Freq.	Freq.	Freq.	Freq.	Freq.
1	Frequent change of leaders among stakeholders restrain regular meetings and creates information gap.					
2	Inadequate communication in process tracking and reporting of all the major project activities.					
3	Conflict resolution gap during absence of Trust and cooperative feelings between stakeholders for the project requirements of cost, quality, spec. and performance of equipment and quality of training.					
4	Fear of agreed clustering relationship sustainability due to contractor's inability of confronting the ideas raised many times.					
5	Luck of thrust and cooperative feeling on contractor with most of the stakeholders.					
6	Only one directional information & order flow.					
Total	Freq.					
	Percentage					
	Cum.%					

7. Failure factors of poor initiation process

S.No	Questionnaires	Summarized responses				
		1	2	3	4	5

			Freq.	Freq.	Freq.	Freq.	Freq.
1	All stakeholders did not equally conceptualize the project idea						
2	Poor quality of need assessment and briefing process only at strategic level.						
3	Command type project acceptance for client						
4	Poor feasibility study conducted without prefeasibility study						
5	Project cost over estimation (on all cost entity)						
6	Conducting the feasibility study without the need assessments and client involvement						
Total		Freq.					
		Percentage					
		Cum.%					

8. Failure in the project planning process

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Poor planning of resources						
2	Unrealistic time and cost estimation						
3	Multi-disciplinary technical competency of trainee not considered well during selection.						
4	Failure to manage expectations (risk)						
5	Installed machineries were not designed and manufactured with METEC as popularized						
6	Building design and wire installation are not planned sufficiently (the same design for all climatic areas)						
Total		Freq.					
		Percentage					
		Cum.%					

Failure in the project implementation process

S.No	Questionnaires		Summarized responses				
			1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Frequent change of leadership among all stakeholders						
2	Irrelevant and unsatisfactory training given with inexperienced trainer						
3	Frequent machine breakdown at commissioning						
4	Luck of implementation continuity due to improperly managing the project procurement						
5	Inability of stakeholders monitoring, control the progress, inspect delivered materials and reviewing the project plan						
6	Poorly motivating of project staff						
Total		Freq.					
		Percentage					
		Cum.%					

9. Failure in the project close out process

		Summarized responses

S.No	Questionnaires		1	2	3	4	5
			Freq.	Freq.	Freq.	Freq.	Freq.
1	Project contracts and liabilities are not properly closed out						
2	Project terminal report is unable to prepared and communicated to stakeholders to be used as future project initiation						
3	Appropriate terminal evaluation is not made sufficiently to measure the deliverables against the plan failure of machineries during commissioning.						
4	Fear of existence of the contractor METEC in the market by the client for the sustainability of relation						
5	Inadequate communication in process of conflict resolution due to deviation of deliverables from planned quality, specification and completeness of machineries and equipment.						
6	Full of secrecy and poorly motivating of involving stakeholders for proper performance evaluation and project closeout process						
Total		Freq.					
		Percentage					
		Cum.%					

Section-II: -Put the following stakeholders in sequential manner based on their contribution for the failure of the projectfor the given characteristic you think.

No.	Name of stakeholders	Put them in priority cause for failure	Influence	Basic competencies	Control over resources	Ability of formulating his/her own interests and
1	METEC/HMMBI					
2	Consultant (HTH)					
3	Sub- contractors					
4	Clients (SMEs offices)					
5	Financial institutions					
6	Owners (Unions)					
7	Public & local businesses					

Source: (GTZ block, 2018).

Appendix -E: Interview questions

SECTION-I:

Thank you in advance for your voluntary participation in conducting of this interview.

I am doing thesis on "**assessment of factors contributing for the failure of regionalflexible manufacturing workshop turnkey projects"**: the case of METEC/HMMBI, Harar and Dire-dawa city SMEs offices".

The purpose of this interview is to gather information about the **regional flexible manufacturing workshops projects** facility preparation (capability of equipment production),implementation and reasons for itsfailure and to recommend for the successful project close out.

Your contribution and honest responses are very important in the study and will help gain better understanding on how to improve **project implementation capabilities**.

Your response will only be used for research purpose.

1. Do you think there is capability of the machinery production facilities, implementation of the project and sustainable technology transfer?
2. How was the participation of stakeholders in each project lifecycle of the project (their role)?
3. Do you think the project is failed? What are your criteria to say so?
4. Which factors do you think highly contribute for the project failure? Prioritize them with respect to the responsible stakeholder.
5. Do you believe that the project contractual agreement well done? is within the scope? If not, what do you think major sources of changes and their effect at the present status?
6. What factors do you think will hinder the future sustainability of the project? how to cope up with the problem with respect to each party?

SECTION-II: For the interviewers rank the stakeholders from 1 to 3 scores to their legitimate power on the project based on the given ranges of types of authority.

Table 1: stakeholders power source analysis.

(score 3 denotes strong, score 2 denotes intermediate, and score 1 denotes weak authority

Types ofauthority	Setting objectives, norms and quality control	Allocating or denying resources	Defining roles, tasks and responsibilities	Structuring the participation in decision-making processes	Controlling access to information and knowledge	Channeling messages to superiors and external bodies	Total
METEC							
SMEs							
Unions							
Consultant							
Sub-contractor							
Financial institutions							
General public							

Source: (GTZ block, 2018).

APPENDIX F:

The project SWOT analysis

Strength

- ✓ The project acceptance
- ✓ Competitive advantage
- ✓ Fully funded project
- ✓ Convincing ability of contractor
- ✓ Owners organization man power
- ✓ Start up speed
- ✓ Availability of production facility of equipment
- ✓ Reaches different regions
- ✓ Market clustering
- ✓ Collaboration of all stakeholders

Weakness

- ✓ Project leadership
- ✓ Gaps in capabilities
- ✓ Outdated technology
- ✓ continuity of supply & activity
- ✓ organizational culture and philosophy
- ✓ management competencies
- ✓ project staff competencies
- ✓ supplies procurement system
- ✓ weak market image
- ✓ Gap of need assessment
- ✓ Communication
- ✓ commitment

Opportunity

- ✓ Political effects
- ✓ Government strategic plan coincidence
- ✓ Industry or lifestyle trends up
- ✓ Technology development and innovation increase
- ✓ Lack of competitive strength
- ✓ Partnerships agencies& distribution
- ✓ Tax exemption policy
- ✓ Project fund availability
- ✓ Economic boom
- ✓ Expansion of higher education
- ✓ Promising government infrastructure development effort and programs

Threat

- ✓ Government deregulation
- ✓ High team turnover
- ✓ Contractor's sustainability
- ✓ Bankruptcy
- ✓ Reliability of data, plan predictability
- ✓ Effects on core activities, distraction
- ✓ Cultural, attitudinal, behavioral issues of contractor
- ✓ Quality and performance
- ✓ Political shift
- ✓ Full of secrecy of contractor
- ✓ Ethnical conflict

APPENDIX G:

Lessons learnt from HMMBI Project.

1. **During phase one (conception).**

- ✓ Starting any project without need assessments leads to market failure and owner's poor motivation
- ✓ Conducting unrealistic feasibility study to set the scope (time, cost and quality) of the project resources leading to failure.
- ✓ Put any other alternative projects assessing the need.
- ✓ Constructing proper project manager and team facilitate the project success.
- ✓ Proper communication with relevant stakeholder helps to reduce chance of failure.

Therefore, ambitious and unrealistically stated project initiation procedure always affect the normal project implementation process. Before offering such full package project, better to study the real capability and experience of the contractor to protect resources loose.

2. **During second phase (planning).**

- ✓ Every schedule, cost and required performance level need to be designed and analyzed seriously before coming to contractual agreement with all stakeholders.
- ✓ Selection of the consultant company for designing and monitoring should be open for competitors to find the right one.
- ✓ Building and testing of prototype must be done to confirm capability and need to obtain approval for equipment production and to construct the project.

Therefore, during planning the project, the production facility of the contractor company needs to be evaluated for the sake of consistent implementation and quality procurement processes.

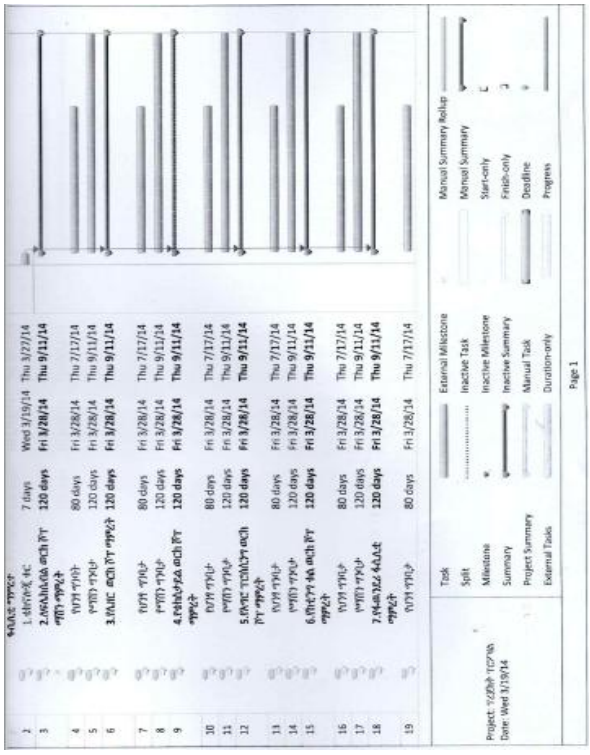
3. **During third phase (execution).**

- ✓ Building of transparency for procurement of materials and produced equipment.
- ✓ Selection of experienced sub-contractors using clear and legal bidding system enable to reduce chance of project failure.
- ✓ Proper communication, monitoring and implementing workable project management system favors the project success.
- ✓ All stakeholders need to participate in the monitoring process to verify the performance and modify the agreement if required for the sake of increasing flexibility and success.

4. **During fourth phase (termination)**
   - ✓ Train owner personnel with formal training with approved trainer, which help ease the training and make owners energetic for their work and sustainability.
   - ✓ Transfer facility, responsibility and resources. Finally transfer the package to new team for sustainability.
   - ✓ Required documentations should be prepared and project lessons learnt should also identified for future projects.

Appendix -H

Secondary documents from the feasibility report.



የብድር አከፋፈል የጊዜ ሰሌዳ(Loan Repayment Schedule Table)

S/N	Year	Principal	Interest	Annual Payment
	Date borrowed			
1	End of year 1	10,678,775.00	4,057,934.50	14,736,709.50
2	End of year 2	10,678,775.00	3,043,450.875	13,722,225.88
3	End of year 3	10,678,775.00	2,028,967.25	12,707,742.25
4	End of year 4	10,678,775.00	1,014,483.625	11,693,258.63

Average interest = Birr 2,536,209.063

4. የአጥሮነት መነሻ ሀሳቦች

4.1 ኢንቨስትመንት መጠን

No.	Description	Cost In Birr Value
1	Fixed Investment	33,715,100.00
1.1	Building & Civil Works	10,000,000.00
1.2	Machinery	23,545,000.00
1.3	Other Specialized Equipment	370,100.00
2	Working capital	9,000,000.00
2.1	For Erection & Commissioning	2,500,000.00
2.2	For Documentation, Training &Familiarization	2,000,000.00
2.3	For Cutting Tools	1,000,000.00
2.4	For Raw Material	2,500,000.00
2.5	For Transportation Cost	1,000,000.00
	Total	42,915,100.00

የማምረቻ ዋጋ(Production Cost)Table

No	Description	Value in Birr
1	Depreciation of Buildings (5%)	500,000.00
2	Depreciation of Machinery (20%)	4,709,000.00
3	Depreciation of Other Specialized Equipment (20%)	34,020.00
4	Interest Payment (Average)	2,434,760.70
5	Raw Materials	21,803,040.00
6	Utilities	748,595.00
7	Wages & Salaries	1,426,025.38
8	Contingency & Miscellaneous	771,658.76
	Total	32,427,099.84

Source: - Feasibility report of HMMBI, 2014)

APPENDIX -I:

Secondary data sources evaluation committee assessment report

Past evaluation committee report during trial for hand overring process initiated with METEC/HMMBI. The committee members from different technical institutes did not agree on different issues to be resolved first before dealing the hand overring. They are show in the following tables as follow only for DireDawa workshop.

Table 1. Part manufacturing shop facilities

S/no	**Machine type**	**Quantity**	**Installation**	**Problem found**	**Required maintenance (remark)**
1	Conventional Lathe	10	Installed	Electricalconnection, lead screw bend, gear box and oil indictor broken, gear box broken, wear gears 03 ok	04 need heavy maintenance, training
2	CNC Lathe	2	Installed	Tool post not function, manual, handle and switchesbroken	Need manual, Training, maintenance 01 ok
3	Conventional milling	5	Installed	Broken handle, switch, gear, lighting, display board, coolant,	Heavy maintenance need for some
4	CNC Milling	2	Installed	Manual, training,	Simple maintenance
5	Universal Grinding	2	Installed		Simple
6	Surface grinding	2	Installed	Electrical line	Simple
7	Radial Drilling	2	Installed	ok	
8	Pedestal drill	2	Installed	ok	Simple
9	Tool sharpener	2	Installed	01 not functional	heavy maintenance
10	Electrical Chamber furnace	2	Installed	Thermostat	Part change
11	Power hack saw	2	Installed	One is not functional	Medium maintenance

Source: -(Secondary document from evaluation committee report, 2018)

Table 2. Fabrication manufacturing shop machineries

S/no	Machine type	Quantity	Installation	Problem found	Required maintenance (remark)
1	Sharing Machine	2	Installed	Anchor bolt loose Leveling,	Rework
2	Combination shearing	2	Installed	Pedal damage Cable broken(both)	One need heavy maintenance
3	Rolling	2	Installed	Control box button & pedal broken, alignment	Simple maintenance
4	Hydraulic press brake	1	Installed	Oil gauge broken, leveling problem, oil leackage.	Given
5	Hydraulic pipe bender	2	Installed	Guide rod missed Display board, pedal & switch damage, motor cover bend	Given
6	Circular power hack saw	2	Installed	ok	Given
7	Pedestal drill	2	Installed	Chip cover missed	Given
8	Arc welding machine	5	Delivered	ok	Given
9	TIG AND MIG (welding machine)	2	Delivered	Body	Given
10	Portable drilling	5	Delivered	ok	Given
11	Portable grinding	5	Delivered	ok	Given
12	oxy-acetylene welding	1	Delivered	ok	Given

Source: - (Secondary document from evaluation committee report, 2018)

Table 3. Production manufacturing shop machineries

S/no	Type of machine	Quantity	Installation	Problem found	Training
1	Pedestal drill	1	Delivered	ok	Given
2	Hydraulic press	2	Delivered	Oil gauge broken	Given

3	Rivet gun	4	Delivered	Ready for use	Given
4	Trolley	2	Delivered	Ready for use	Given
5	Spray type testing machine	1	Delivered	Ready for use	Given
6	Surfaces plate	2	Delivered	Ready for use	Given
7	workbench	3	Not delivered		

Source: - (Secondary document from evaluation committee report, 2018)

Table 1. external evaluation committee summarized report on the civil work.

S/no	Civil work type	Problem found	Remark
1	Main work shop	Floor not in factory standard Cable trench shallow Roof problem(leakage) Poor ventilation (Dire-dawa)	Floor need rework, concrete Cable trench need redesign (form work and plate cover) Ventilation system need redesign No industrial ventilation installed
2	Cafeteria hall	Big cracks Broken windows Drainage flow	Need retention work
3	Toilet and shower	Cracks Broken taps Plumbing problem Low quality equipment	Needs a lot of retention work
4	Guard house	ok	
5	Fence	ok	

Source: - (Secondary document from evaluation committee report, 2018)

ጉዳዩ፡- <u>የግንባታ ኢንስፔክሽን ሥራን ይመለከታል።</u>

በድሬዳዋ ከተማ አስተዳደር ተገነባው የፍሌክሲብል ወርክ ሾፕ ዋና ሾፕ ፣ የምግብ ቤት፣ ሽንት ቤት፣ መጋዘን፣ የጥበቃ ቤትና አጥር አካቶ ተጠናቋል። በመሆኑም ሥራውን ለሚመለከተው አካል ለማስረከብ ከታች የተዘረዘሩትን የኮሚቴ አባላት በማዋቀር የኢንስፔክሽን ሥራው የነበሩትን ጉድለቶች እንደሚከተለው ዘርዝረናል።

1. በዋና ወርክ ሾፕ የታዩ ችግሮች
   - 1.1. Cable trench reinforced concrete cover ያስፈልገዋል
   - 1.2. Minor cracks half ditch ዙሪያ
   - 1.3. አንድ አንድ መስኮቶች አይከፈቱም
   - 1.4. ዋናው የኤሌክትሪክ ማስተላለፊያ በሽቦ ነው (cable tie ይሁን)
   - 1.5. የውጭ የግድግዳ ፍሎረሰንት መብራቶች ተሰቅሏል
   - 1.6. Industrial ventilator የለም
2. በኮፍቴሪያ ሽንት ቤት እና ስቶር የታዩ ችግሮች
   - 2.1. የመመገቢያ አዳራሹ ወለል ተሰንጣጥቋል ተቆፍሮ ይጠገን
   - 2.2. የመስኮት ድጋፍ (Support) አብዛኛው ተሰባብሯል ጥንካሬ የለውም በታውም ይቀየር እና ይበየድ
   - 2.3. የተሰባበሩ የመስኮት መስታወቶች አሉ ይቀየሩ
   - 2.4. የኤሌክትሪክ መስመር ወደ ጥበቃ ቤት፣ ሽንት ቤት አልተዘረጋም (አልተገናኘም) ተስተካክሎ መስራቱ ይሞከር
   - 2.5. የውጭ የእጅ መታጠቢያ ገንዳዎች Flexible hose ይቀየርላቸው
   - 2.6. ሙሉ የጠርዝ ቀለም ለቋል (ይቀባ)
   - 2.7. በስተውጭ ያለው Grid beam ተሰንጥቋል ይጠገን
   - 2.8. የውሃ መስመር ወደ ሽንት ቤት ሮቶ አልተገናኘም ታፑም አይሰራም (መዝጊያና መክፈቻውም)
   - 2.9. Half ditch ፋሳሽ በአግባቡ አያስተላልፍም ደለል ሞልቶታል
   - 2.10. ኮርኒስ ጠርዝ ተሠንጥቋል በሠፊው ከፍቷል ታኮ ይደረግ
   - 2.11. ሽንት ቤቶች አንድ አንድ የቧንቧ መዝጊያ መክፈቻው(tape) ተሰብሯል ይቀየር
   - 2.12. መብራት ለኮፍቴሪያውና ለሽንት ቤቱ አልደረሰም

ከላይ የተዘረዘሩት ችግሮች ግንባታውን ያከናወኑት ተቋራጮች ባሉት ያዩትና ያመኑበት ነው በመሆኑም ጥገናው በአጭር ጊዜ ውስጥ አከናውነው ለማስረከብ የኢንስፔክሽን ኮሚቴው አባልም ሆነው በዚህ ቃለ-ጉባኤ በፊርማቸው አረጋግጠዋል።

Summary of Machineries and Accessories Demanded and Supplied

No.	Name of Department	Name of machine	Quantity		Functionality (yes/No)	Specification (yes/No)	Basic Accessories	
			Qty dd	Qty sd			Qty dd for each machine	Qty sd
1.	**Part Manufacturing Machineries**	Conventional Lathe machine	10	10	Only 1 is not Function	yes	12	5
		CNC Lathe machine	2	2	Only 1 is not Function	yes	12	4
		Conventional Milling machine	5	5	Only 1 is not Function	Only 1 is below the Specification	11	5
		CNC Milling machine	2	2	No	yes	11	1
		Cylindrical Universal grinding machine	2	2	yes	No	5	4
		Surface grinding machine	2	2	yes	No	5	2
		Radial drilling machine	2	2	yes	yes	5	0
		Pedestal drilling machine	2	2	yes	yes	5	1
		Tool sharpeners	2	2	yes	yes	1	0
		$9000\ ^{0}c$ Heat Treatment capacity of Electrical chamber furnace with quenching bath	2	2	No	yes	2	0
		Power hacksaw	2	2	yes	yes	4	0
		Total	33	33				

FILXABLE WORK SHOP FACILITIY MACHINERY TECHNICAL SPECIFICATION REPORT

Summary of Machineries and Accessories Demanded and Supplied

No.	Name of Department	Name of machine	Quantity		Functionality (yes/No)	Specification (yes/No)	Accessories	
			Qty dd	Qty sd			Qty dd for each machine	Qty sd
2.	**Fabrication machineries**	Shearing machine (200mmx6mm)	02	02	yes	yes	2	0
		Combination shearing machine	02	02	yes	yes	3	0
		Rolling machine (1000mmx2mm,2000mmx4mm)	02	02	yes	yes	1	0
		Hydraulic press brake Bending machine	01	01	yes	yes	3	1
		Circular power hacksaw	02	02	yes	No	2	0
		Pipe Bending machine	02	02	No	yes	3	0
		Electrical Arc welding	05	05	yes	yes	2	1
		Oxyacetylene welding	01	01	No	yes	4	3
		TIG & MIG welding	02	02	No	No	6	4
		Portable drilling	05	05	yes	yes	2	2
		Portable Grinding	05	05	yes	yes	2	2
		Pedestal drilling machine	02	02	yes	yes	5	0
	Total		**31**	**31**				

FILXABLE WORK SHOP FACILITIY MACHINERY TECHNICAL SPECIFICATION REPORT

Summary of Machineries and Accessories Demanded and Supplied

No.	Name of Department	Name of machine	Quantity		Functionality (yes/No)	Specification (yes/No)	Accessories	
			Qty dd	Qty sd			Qty dd for each machine	Qty sd
3.	Production machine & facility	Hydraulic pressing machine / 15 Ton/	02	02	yes	yes	1	0
		Riveting gun	04	04	No	yes	1	0
		Trolley	02	02	yes	yes	0	0
		Spray gun	01	01	No	yes	1	0
		Surface plate	02	02	yes	yes	2	0
		Work bench	03	0	No	No	6	0
		Pedestal drilling machine	01	01	yes	yes	5	0
		Total	15	12				

Picture of the internal view of the worrkshop.

Some products

outside view