A STUDY OF COMMUNICATION AND LANGUAGE SKILL PROBLEMS IN GOVERNMENT BUILDING CONSTRUCTION PROJECTS IN SRI LANKA

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DECLARATION

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ABSTRACT

A study of communication and language skill problems in government building construction projects in Sri Lanka

The international construction market faces a rapid increase. However, the glitches created regarding poor communication abilities seems to be the most significant contemporary challenge commonly faced by construction project managers. Though not recognized in the education system of Sri Lanka as vital as it is required, language skill is a principal factor that plays a critical role, particularly in the service industry. The competency in language skills in all aspects of spoken and written skills secures more employment opportunity within the work force in both private and public sectors alike. Communication and teamwork skills are basic expectations of any employer in construction world today. In Sri Lanka, not only Sinhala or Tamil but English language is also in high demand. Employees who can communicate coherently in demanded languages are able to counterpart with project team successfully that make them an asset to their employers.

This study was conducted to determine critical constrains found in construction industry, concerning government building project in present day. Specific problems regarding communication and language skills as a competency requirement for professional practice and team work are also identified in this study.

Findings from literature survey and key findings from interviews conducted which are supported by a case study on an actual government construction project were analyzed to identify problems. Survey reveals that there are numerous problems arising due to poor language skills. It also disclosed how project work suffered which resulted in cost and time overruns with poor quality deliveries leading to disappointments for all parties concerned.

Finally, suggestions were discussed to overcome such problems that arise due to language skill problems in government construction projects. These suggestions were made by professionals and stakeholders to support and standardize professional practices. Objectives of the research were achieved and concluded with relevant recommendations to improve government construction project work regarding communication aspect which will help project standardization in the future.

Thus, this research is to discuss the result of the interview with the Design Team and Construction Team of Government Building construction projects. It was carried out along with a single case study, regarding communication and language problems that occur in the construction industry in Sri Lanka today and the relevant improvement suggestions that can be implemented.

Keywords: *Communication, language skills, Building Construction, Project teams, Government building projects.*

DEDICATION

With my heart full of gratitude,

I dedicate this dissertation to

my loving Mother,

who has supported me

in every possible way to

make this a success.

ACKNOWLEDGEMENT

This dissertation would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

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LIST OF ABBREVIATIONS

CIDA	Construction Industry Development Authority (Sri Lanka)
ICTAD	Institute of Construction Training and Development (Sri Lanka)
ILO	International Labor Organization
GDP	Gross Domestic Product
GDFCF	Gross Domestic Fixed Capital Formation
UDA	Urban Development Authority
SLIA	Sri Lanka Institute of Architects
QS	Quantity Surveyor
BOQ	Bill Of Quantities
NGO	Non-Government Organizations
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organization
NHDA	National Housing Development Authority (Sri Lanka)
CEA	Central Environmental Authority (Sri Lanka)
2D	Two Dimensional
3D	Three Dimensional

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CHAPTER I

INTRODUCTION

1.1 Introduction

Construction Industry is a major contributor to the National Economy and a major driver of employment creation. The development of the Construction Industry will create a multiplier effect in the national development process, owing to its forward and backward linkages, leading to sustained National Economic Growth in both private and public sector.

The Sri Lankan construction industry is on an upward trend, due to the post-conflict scenario in the country. The end of the island's ethnic war in 2009 has revived the economic activity and resulted in an infrastructure building boom. Sri Lanka's construction industry has, historically, been supported mainly by housing, industrial and physical infrastructure. (www.foresight.lk 2017)

The partners of the construction industry consist of a range of stakeholders. There is the investor or developer who generates work. These works are formulated and designed by the specialized professional groups such as planners, architects, engineers, quantity surveyors, project managers, and financial consultants. The contractors, construction material manufacturers & suppliers and construction equipment suppliers& hirers, and the craftsmen contribute in the physical facilities. The policy makers, regulators of standards, academic, testing and training organizations, professional bodies and research organizations play their respective roles.

The Construction Industry Development Authority (CIDA) (successor to ICTAD) is an organization set up by the Government of Sri Lanka to develop and promote the domestic Construction Industry, Contractors, Professionals, Work Force, etc. CIDA has established itself as a recognized and important constituent of the Construction Industry. (www.cida.gov.lk 2017)

Most of the Government construction projects have been designed and project work consultation done by private sector consultants and contractors through pre-qualified or selected by a tender.

Consultant is involved with Client's party Government Authority at the first phases of the project including design and Tender stages whereas latter stages with contractors and suppliers. Most of the government officials use Sinhala as the main language where as private consultant parties use English language as the first language in construction work.

According to the local building standards and standards in construction industry English is the main language to be used in construction documentation to CIDA. (www.cida.gov.lk 2017). The issues and problems raised within the construction team due to incompetency in English language faced by the construction industry in Sri Lanka is nothing new. The problems raised due to language skills has existed for a long time in various sectors in the whole country. However, the workers who are fluent in languages enjoy the benefits of learning from each other on the jobsite.

In order to overcome these communication barriers strategies such as timely reports, team meetings, delegating responsibilities, clear communication channels, adjusting & adopting and problem solving are persistently used by the construction project managers.

It is indeed enlightening if the industry is planning to take necessary steps to resolve the problems related to communication skills that is currently faced. Solutions created to diminish the language barrier will enhance the work productivity and in return will definitely improve the image of the construction industry.

Language barrier is the lack of ability to communicate effectively which in return has a negative impact that is commonly faced by the construction industry.

The objectives of the research have been achieved by the researcher through both, a primary study and a questionnaire survey.

1.2 Problem Statement

Government sector construction projects mainly focus on the budgetary allocation of the current fiscal year. The main concern of many government authorities is to construct new buildings and infrastructure facilities to compete with other such government authorities to highlight their own political agenda only as a showcase of public services.

However, government authorities always follow a standard procurement process and tender procedure. Therefore, services of professional consultants and CIDA (ICTAD) registered contactors are obtained and involved to ensure proper records of their financial allocations in the relevant construction projects.

Building codes, regulations standard documents such as ICTAD documents are written in English language and it states all the construction work should be explained, published and work carry out in English language in Sri Lanka though the National language and the majority speaks and use Sinhala language.

The design team as well as the construction team along with the client involvement from inception to completion of any project is taken in to consideration in this research. In this procedure, the main responsibility of client and consultants is to minimize time and cost overrun yet ensuring the quality of work up to the expected standard.

Problems could arise when time, cost and quality measures are not addressed properly due to several reasons. Proper communication among the team is a key factor to obtain a smooth work flow and quality of work. When miscommunication arises, professionals along with the entire construction team faces problems which leads to financial losses to all parties concerned due to inability to obtain the required quality of work. In order to overcome communication issues, ensuring everyone in the team understand instructions as well as respond and participate without a doubt is essential. Therefore language skills of professionals and project team is greatly important in government building construction projects.

1.3 Aim and Objectives

Aim: Address the communication issues in Government building construction industry and come up with solutions to improve the efficiency in projects to contribute development of construction industry in Sri Lanka.

2. Identify communication and language skill problems if team members in government building projects.
3. To analyze communication and language skill problems arising from lack of professional and occupational competence along with lack of standardization and modeling in the building construction process.
4. Find most critical stages of procurement process affected by communication problems and identifying which category of the team members need improvements most, for problem resolution.
5. Discuss solutions to overcome such problems in the context of construction project culture.

1.4 Purpose of the study

This study is conducted to understand the problems that arise in a Government construction project due to lack of language skills to communicate during the procurement process from inception to completion of a construction project regarding all parties concerned namely the principal consultants, clients, site staff…etc.

The general languages uses in Government authorities are Sinhala and Tamil whereas English is the standard language to be used in Construction industry work in Sri Lanka.

There are many foreign companies, organizations and workers involved in construction work in the government construction sector. Hence the need of this type of research and study is much awaited since there are many time, cost and quality issues are involved and experienced in government construction industry from many years which are not addressed to date.

This survey was based on the problems faced due to communication issues and solutions established with reference to frequency, opinion, importance, experience and challenges that both client and management had to confront during the construction of a project. Solutions should broadly apply to the project process in future projects to overcome problems and maintain efficiency of project Quality time and economy.

Literature reviews and Interviews are elaborated to understand research methodology. Data gathering was done with person to person semi-structured interviews and by telephone interviews.

1.5 Scope and Limitations

The scope of this research is specially focused on the perspective of the project manager / Consultants and the client, in various government construction projects. Where the government body represents the client, the project manager would be the team leader of the relevant construction project.

Government 'Building' construction projects were considered among all the other Government development projects, where majority involved were Sri Lankan Sinhalese and Tamils. Whereas major developments like Road constructions, irrigation development works carrying out with the help of foreign contractors, consultants and fork force.

The projects selected were from 01 January 2013 to 01 May 2017(projects completed as well as in the under-construction stage). The data collection was focused on graded C1 and C2 contractors and developers registered in 2017 with the Institute of Construction Training and Development (ICTAD). Several non-members of ICTAD were also selected by contacting architectural firms and architects who are registered under Sri Lankan Institute of Architects (SLIA).

Other data collected are from government bodies including ministries and authorities.

1.6 Research Methodology

1. Literature Review

   In the literature review, the definition of Construction Industry in Sri Lanka, importance of communication in the industry, issues due to communication and language skills related to project works in local and international context, were examined through books, journals, online publications, written thesis and case studies.

2. Case study analysis

   Case study is important as any other research method. It is a way of investigating an empirical topic by following a set of pre-specified procedures. It is a single Case study research with mix of both qualitative and quantitative evidence. Case study explains real-life context where communication and language skill problems occur and how it affects to the project process related to cost quality, time, overruns and failures.

3. Interviews and Questionnaire Survey

   First step was individual telephone interviews carried out to verify the literature findings and to identify the communication issues in building construction projects and how it affects the construction procurement process. Questions to understand importance, opinion, experience and frequency. Above information were gathered through a questionnaire.

   Second step was to present, semi-structured person to person interviews to understand the respondent's ideas and solutions they suggested to overcome communication problems in the construction industry.

   Semi-structured interviews were carried out after identifying telephone survey issues and according to solutions validated and expressed by professionals.

1.7 Chapter Breakdown

Chapter 1 – Introduction

The first chapter comprises of the background of the research, problem statement, purpose of study, aim and objectives, scope and limitations of the research, methodology and chapter breakdown.

Chapter 2 – Literature Review

This chapter provides a comprehensive review on the current status on sustainable practices in the construction industry and the need for sustainability on residential projects.

Chapter 3 – Construction Project Culture

The third chapter elaborates the key issues in construction industry and project teams, with reference to government construction projects. It also discusses the role & responsibilities of the project manager in relation to the key administration and reference of communication problems in the context of construction project culture.

Chapter 4 – Research Methodology

This chapter elaborates the methods of finding relevant data to achieve research needs and objectives.

Chapter 5 – Research Findings and Analysis

In this chapter, the collected data and various interpretations and analysis about such collected data are discussed.

Chapter 6 – Conclusions and Recommendations

The closing chapter concludes the research with conclusion, recommendations and suggestions for implementations, improvements and further research.

CHAPTER 2

BACKGROUND / LITERATURE REVIEW

2.1 Introduction

This chapter provides a literature review on building construction industry in Sri Lanka where various parties and authorities involve in regulating and implementing construction. It further analyses key issues in the industry, construction project process, procurement services and professional involvement in projects. It also elaborates communication links, project team, professional engagements, group interaction in a project and issues that arises due to miscommunications. Moreover, previous studies and research outcomes based on project management as well as group communication aspects are also discussed and presented in this chapter.

2.2 Building Construction Industry in Sri Lanka

The scope of the construction industry consists of a vast range of developments, varying from personalized houses to massive infrastructure projects such as roads, power plants and petrochemical facilities.

In the recent years the construction industry of Sri Lanka has experienced a rapid growth. This construction boom is predominantly found in the property development sector. The pioneers in the local constructions businesses are even adequately competitive and capable in handling international projects with their vast experience and technological headship gained within the local construction industry with distinct skills in operations, maintenance and management.

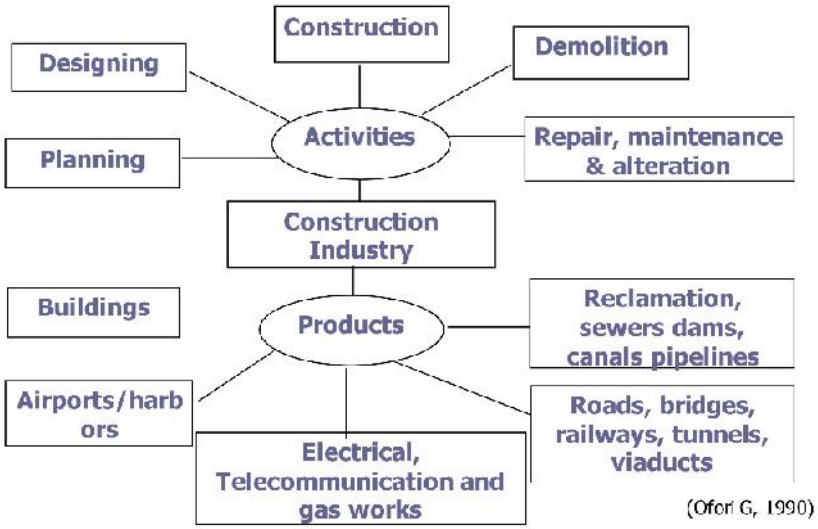


Figure 2.1 Construction industry

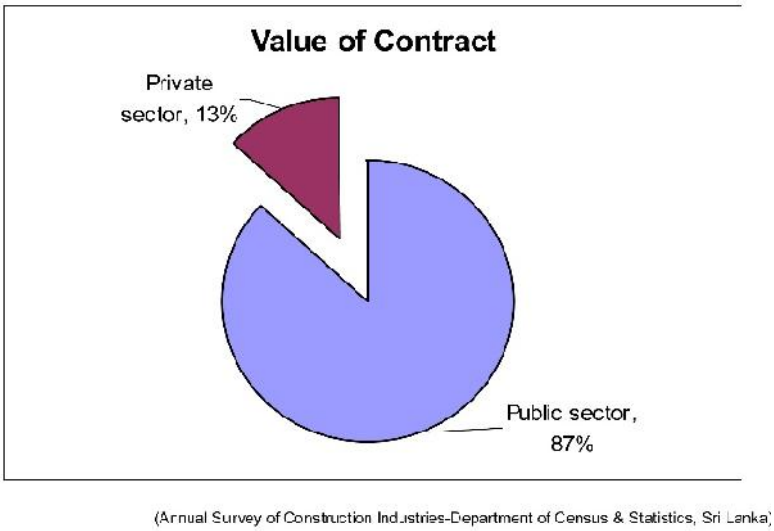


Figure 2.2 Value of contract
(www.statistics.gov.lk)

Unique characteristics of construction - "The construction industry has characteristics that separately are shared by other industries but in combination appear in construction alone." (Hillebrandt, 1984)

"Construction industry" is defined as the activity, which creates categories varying from new buildings and civil engineering projects, to maintenance and repair of existing facilities (Wells, 1984). (R. Rameezdeen.2006)

Construction industry is composed by

an integration of various STAKEHOLDERS

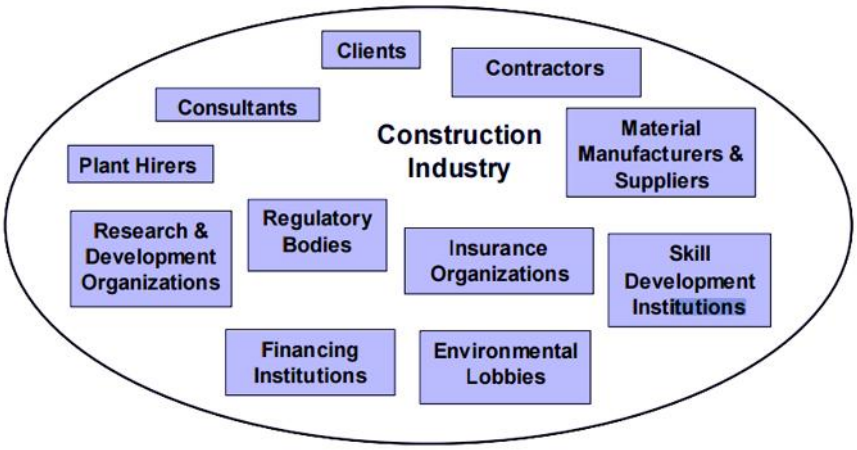


Figure 2.3 Stakeholders in the construction industry

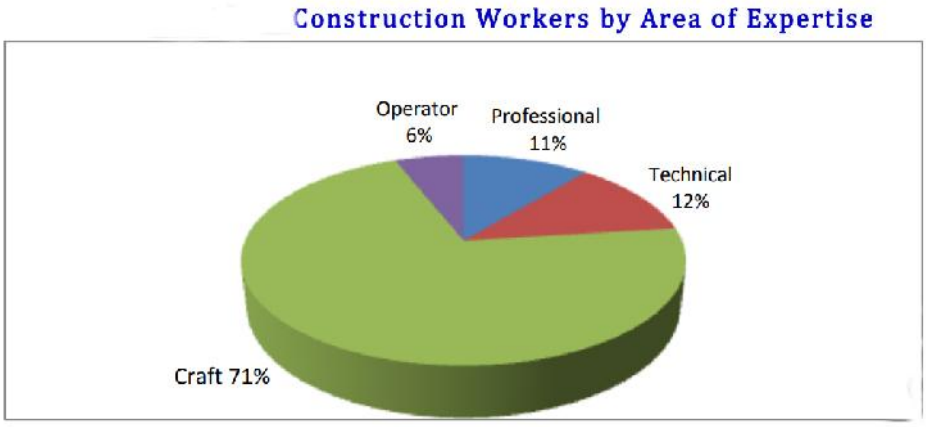


Figure 2.4 Areas of expertise (www.statistics.gov.lk)

(ILO) International Labour Organization (2003) defines the industry as, "The construction sector produces a wide range of products, from individual houses to major infrastructure such as roads, power plants and petrochemical complexes. In most countries output is roughly equally divided between housing, other buildings and civil engineering projects. Although attention is mostly focused on new construction, the renovation and maintenance of existing structures accounts for almost 50% of total construction output in some of the more developed economies and an even greater share of employment".

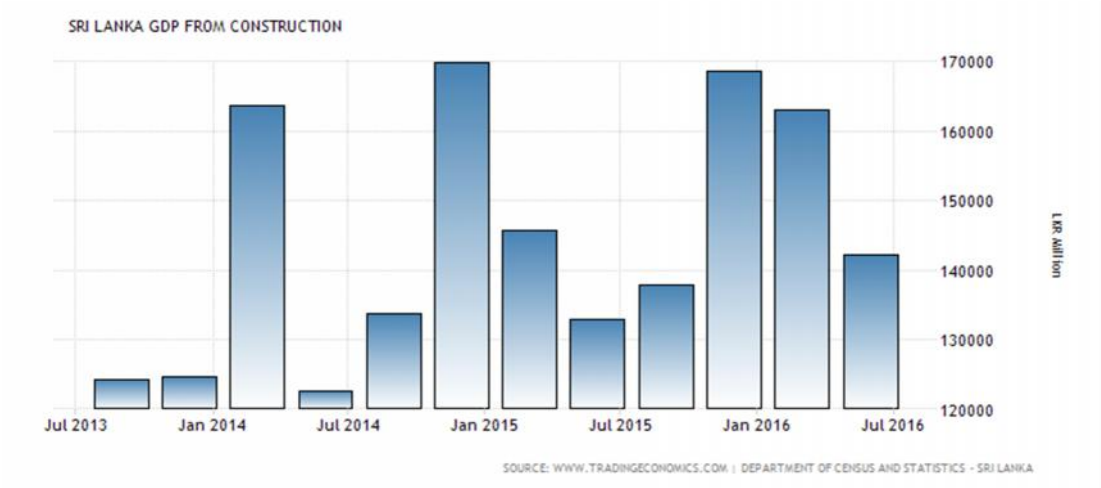


Figure 2.5 Sri Lanka GDP from construction (www.statistics.gov.lk)

The Sri Lankan construction industry is expected to grow at a rapid pace in the post-conflict scenario. The end of the island's ethnic conflict in 2009 has revived the economic activity and resulted in a strong focus on infrastructure development. Construction industry in the Sri Lankan context is the 4th largest sector that contributes 6 -7% to (GDP) Gross Domestic Product over the former decade. This sector is also responsible for more than 50% of Gross Domestic Fixed Capital Formation (GDFCF) that provides employment to 4-5% of labor force and contributes about 30% to trade balance.

GDP gained from the construction industry in Sri Lanka is averaged to a sum of LKR 127,297.62 million since 2010 up to 2016. It reached an all-time high of LKR 170,122 Million in the first quarter of 2013 and a record low of LKR 77,176 Million in the second quarter of 2010. (Department of Census & Statistics, Sri Lanka).

The Construction Industry plays a vital role in the National Economy, contributing a substantial percentage to the National Gross Domestic Product, creating major employment opportunities in the industrial sector. The National Development process is stimulated by the Construction Industry in many facets. This is by reason of the forward and backward linkage of the Industry which would lead to a sustained growth in the National Economy.

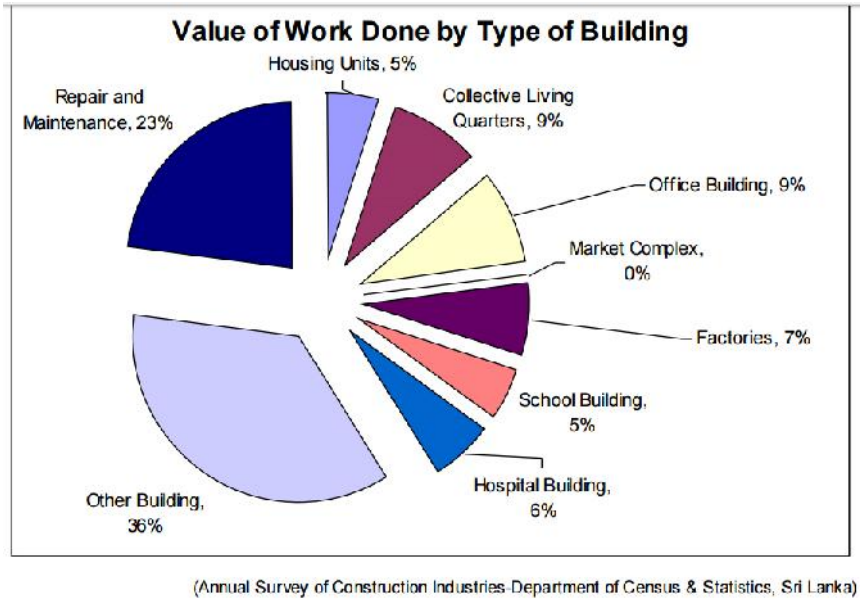


Figure 2.6 Value o9f work done by type of building
(www.statistics.gov.lk)

2.3 Sri Lanka Construction - SWOT analysis (www.icralanka.com)

Strengths

- Significant long-term government support for the industry
- Support schemes and incentives for the construction industry provided in Annual Budget
- Adequate institutional infrastructure
- Significant contribution to Gross Domestic Fixed Capital Formation, the country's GDP and employment

Weaknesses

- Excessive cost of construction materials
- Changes in regulations by UDA, Urban Development Authority during the progress of construction
- Lack of skilled workers
- High interest rates
- High rate of construction accidents

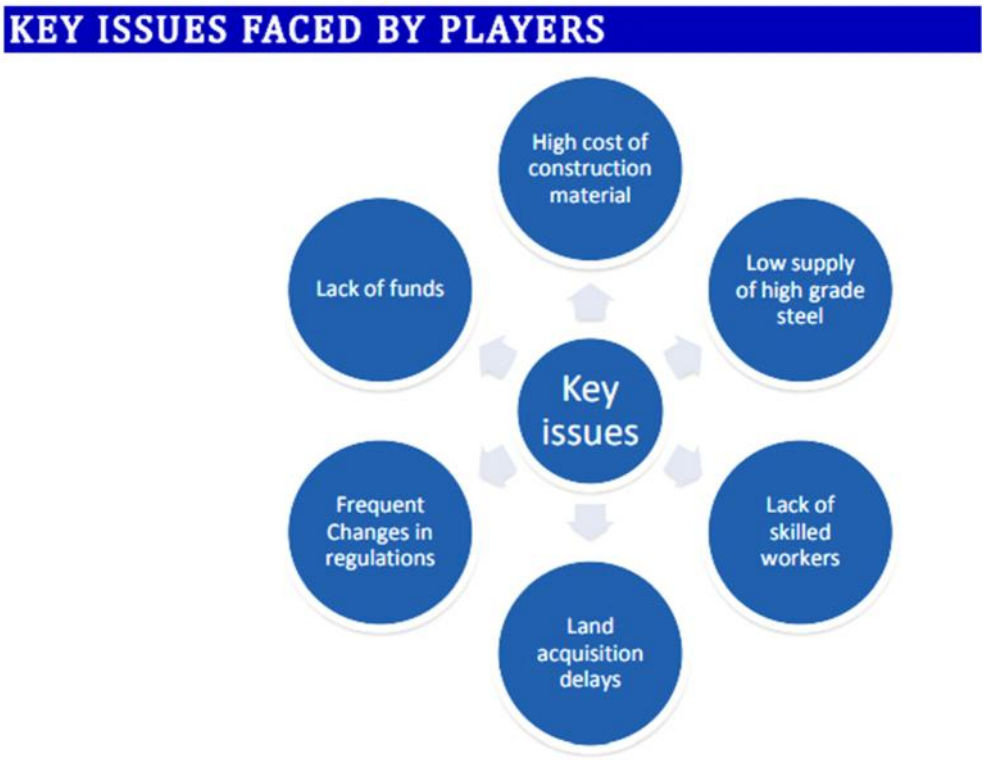


Figure 2.7. Key issues in construction projects

Opportunities

Following the end of ethnic conflict in 2009 in Sri Lanka, a prominent revival in economic activities was created that resulted with the focus on infrastructure development.

Since then foreign investments rapidly increased where over US$ 24.5 billion of projects for the next six years in many categories including expressways & highways, traffic management, rail transport, water supply, power plants, ports and housing developments. Tourism industry identified an arrival target of 2.5 million foreign tourists by the year 2016.

The demand for hotel rooms alone is to double from the current stock.

Threats

However high economical shortages may impose constrains in infrastructure spending, along with competition from other South Asian countries for foreign capital.

A shortage of skilled workers with better English language competency may be experienced with migration of Sri Lankan construction workers to neighboring countries and to the Middle East as happening for a long time. Also, if the rehabilitation of the displaced population in the North is delayed, an antagonistic international publicity may have a negative impact on the required foreign assistance.

2.4 Construction Industry Development Authority (CIDA) (successor to ICTAD)

The Construction Industry Development Authority (CIDA) is an organization set up by the Government of Sri Lanka to develop and promote the domestic Construction Industry, Contractors, Professionals, Work Force, etc.

CIDA facilitate and regulate the construction industry by setting standards, providing advisory services, facilitating alternative dispute resolution procedures, conducting technical auditing & researches on construction economics, and registration & monitoring of qualified persons & designating identified construction works.

The main areas of activities of CIDA

1. Recommend strategies for the development of the Construction Industry and assist in their implementation.
2. Regulate registration and grading of Construction Contractors.
3. Promote professionalism of consultants and coordinate activities of professional bodies and assist in the formation of similar bodies in the Construction Industry.
4. Promote /Facilitate export of construction industrial services by undertaking overseas contracts.
5. Provide advisory services to the Construction Industry.

6. Review human resource requirements of the industry and assist in the provision of training facilities.
7. Promote the advancement of the skills and expertise of personnel and professional bodies in the Construction Industry.
8. Promote /Undertake research on matters related to the Construction Industry.
9. Promote Quality Assurance and productivity in the Construction Industry.
10. Promote and grant assistance to the development of industries related to the Construction Industry.
11. Undertake or assist any other activity for the promotion of the Construction Industry.

CIDA standards and documents were written in English language stating, all the documentation and construction procurement work should conduct in English language in Sri Lanka though our National language is Sinhala and secondary language comprises Tamil.

2.5 Key issues faced by the industry

Construction industry in Sri Lanka faces many constrains such as magnified cost of construction material, low supply of high grade steel, lack of skilled workers, delays in land acquisition, frequent changes in regulations and lack of funds.

2.6 Project Team

Design Team

1. Client – Government Authority, Ministry. – The Director, Chairman, secretary, Accountants, Clarks and supportive staff
2. Consultants – Architect, QS, Engineers in different disciplines such as Electrical, plumbing, solar power, Services, Geo Engineers, Accountants, Site supervisors.

Construction Team

1. Contractor – Engineers, Clark of work, electricians, painters, bar benders, machine operators, Accountants, QS and workers.
2. Sub-Contractors - Landscape , Interior Construction, Façade installation
3. Suppliers – AC, Lift, Solar, Generators, Equipment

1. Client

1. Initiates the project
2. Finances the Project
3. Directly & indirectly monitors the progress against the facts - time, cost, and quality and acknowledge variations to the design if any during both design and construction stage. (Rameezdeen 2006)

Types of Clients

a. Private sector
   - Individuals (investors in housing, commercial and industrial)
   - Organizations (sole proprietors/partnerships/limited liability companies)

b. Public sector
   - Central government ministry (Highway, Health, Housing), Department, Authorities (UDA, NHDA, CEA) •Provincial council
   - Local government authorities (MC, UC, Pradeshiya Saba)

c. Non-Government Organizations (NGO) UN/UNESCO/SARVODAYA/WHO

2. Consultants

a. Architect: Leader of the building team. Interprets the client's project requirements into a specific design. Responsible in obtaining the planning permission for the project from relevant authorities.
b. Engineer: (Structural, Electrical, Mechanical, Geo-technical, Hydraulic)

Structural Engineer: An advisor for all structural problems and solutions, such as stability of the proposed structure, suitability of selected materials, suitability of structural components to be used in the project.

Services Engineer: Analyzes the client's requirements and advice the Architect on most suitable design solutions, prepare diagram on the building services. Assures that all required comforts are achieved by the client.

a. Quantity Surveyor: Involved in dealing with all aspects related to construction cost and advices both client and architect on cost of the proposed project. Ensures that the project is managed within the cost limit according to the requirement of the client.
b. Project Manager: Employed mostly in large projects, for overall control of the project from inception to completion for better coordination of all the stakeholders involved. Responsible for day-to-day project management. Given authority by the board to run the project within agreed constraints.
c. Other specialist consultants: Surveyors, Interior Designers, Landscape designers, Planners

3. Contractors

Contractor is identified as an individual or a firm who undertakes to complete a construction project in accord with the contract document on behalf of the employer.

a. Sub-contractors
b. Domestic sub-contractors
c. Nominated/Specialist sub-contractors

Classification of Contractors

To avoid anomalies and to maintain uniformity, the government decided to register contractors centrally. In 1989 Central Registration scheme was started by ICTAD and

it was revised in 1993, 1995 and 2008 & now the registration scheme is being continued by CIDA (Construction Industry Development Authority), (successor to ICTAD). Registration and grading is a screening process for the capabilities of prospective contractors to determine their general ability to undertake different types and sizes of projects without reference to any specific contract.

2.7 Building Construction project process

Design is a process of creating the description of a new facility, usually represented by detailed plans and specifications. Construction is a process of identifying activities and resources required to make the design a physical reality. Hence, construction is the implementation of a design envisioned by architects and engineers. In both design and construction, numerous operational tasks must be performed with a variety of precedence and other relationships among different tasks.

The following stages provide a general overview of the project process, from the conceptual stage through bidding, construction stage and completion of a project.

Concept –

The stage where the preliminary design & conceptual sketches are prepared to interpret the design requirements, the characteristics of the project are illustrated enabling to agree on spatial arrangements and the overall appearance constituted.

At this point preparation of sketch proposals are involved to determine the requirements of the client.

The project programme along with a basic cost guide (based on per square foot rate) for the project is arrived at this stage.

SWOT analysis which is a strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities and Threats involved in a project are observed and zoning plans of the project are prepared.

Development –

Develop the schematic design to a more descriptive 2D and 3D presentation finalizing the design and working cohesive with other consultants, where necessary.

All applications & drawings necessary for local authority approval are also prepared at this stage.

A preliminary cost statements prepared by the quantity surveyor will be submitted for information.

Implementation –

The most significant stage. Construction drawings are prepared obtaining necessary co-ordination with the other consultants. All architectural drawings, working drawings, schedules and specifications are prepared and updated. Following the preparation of all necessary drawings, schedules and specification details a Bill of Quantities [BOQ] is prepared. Thereafter, with the consent of the client tender drawings are prepared based on details of the previous phase. The preparation of tender and contract documents, including all survey and design work needed to prepare quantities and guideline costing.

Bidding and negotiation –

Open tenders, open calls for tenders, or advertised tenders are open to all vendors or contractors who can guarantee performance.

Restricted tenders, restricted calls for tenders, or invited tenders are only open to selected prequalified vendors or contractors.

The reasons for restricted tenders differ in scope and purpose. Restricted tenders can come about because:

- essentially only one suitable supplier of the services or product exists
- of confidentiality issues (such as in military contracts)
- of the need for expedience (as in emergency situations)

- of a need to weed out tenderers who do not have the financial or technical capabilities to fulfill the requirements

The two most commonly used methods of tendering are single-stage selective tendering or two-stage selective tendering. Both involve the invitation of tenders from firms on a pre-approved list, chosen because they meet certain minimum standards in general criteria such as financial standing, experience, capability and competence. The tenders are submitted on the basis of minimal information, and in the second stage the employer's team will develop the precise specification in conjunction with the preferred tenderer.

An evaluation report along with the recommendations is prepared next. Required assistance is provided to negotiate if necessary and select the most suited contractor. Then arrangements are made to sign the contract between the client & the selected contractor.

Award of Contract –

Bonds and securities prepared and sign contract documents.

Mobilization Advances arranged for the Contraction parties. Setting out of the building and construction work according to the programmed chart. Continues site supervision, progress review meetings, and quality checks conducted by managers. Interim payment arrangements for Consultants and contractors.

Termination/ Handing Over

Final site supervision is carried out and quality checks are conducted by project managers.

Final payment arrangements for Consultants and Contractors are also made.

Testing and commissioning work are carried out by consulting engineers.

Guarantees, warrantees and inventory lists are prepared.

Handing over of the project to the Client is carried out with keys and necessary documents.

At this stage retention amounts are set and the defects liability period is determined for the project.

2.7.1 Procurement process in a building construction project

The procurement of construction services syndicates the team with the resources required to transform the building plans into a physical reality.

Definition: It is a strategy to satisfy the development of the design brief of the client and/or operational needs with respect to the provision of constructed facilities for a distinct life cycle. This consists of making the contract (type of contract, conditions, terms), selecting the contractor, establishing the contract price and economic considerations (Labour, materials, plants, capital)

Type of procurement systems:

1. Separated system
2. Co-operative system
3. Integrated procurement system
4. Management-oriented procurement system

For the client to obtain competent construction services assistance of construction procurement activities are essential. The consultant architect prepares bid packages or requests for proposal or qualifications as well as supports the selection, negotiation and processes of the award of contract. (Charvat 2000)

Government construction project categories:

Table 2.1. Government construction projects (www.buildings.gov.lk)

GOVERNMENT CONSTRUCTION PROJECTS

Community Buildings
Auditoriums
Clubs
Community Centers
Convention Centers
Libraries
Museums

Educational
Boarding Schools
Cafeterias
Classrooms
Colleges & Universities
Community Colleges
Day Care Centers
Dormitories
Gymnasiums
Junior High Schools

Electrical & Mechanical
Data Centers
Electrical Work

Entertainment
Aquarium
Broadcast Studios
Casinos
Concert Halls
Entertainment Complex
Movie Theaters
Playhouses
Television Production Studios
Zoos

Government
Courthouses
Fire Stations
Governmental Offices
Miscellaneous Government Buildings
Park Buildings
Police Stations
Post Offices
Prisons

Industrial
Hatcheries
Industrial Laboratories
Laboratories
Manufacturing Facilities
Oil Refineries

Military
Dormitories
Military Housing
Military Offices
Miscellaneous Military Schools

Offices & Warehouses
Offices
Offices & Warehouses
Rental Warehouses
Warehouses

Religious
Chapels
Churches
Religious Auditoriums
Religious Classrooms

Residential
Apartments
Condominiums
Single Family Homes
Single Family Tract Homes
Townhomes

Sports
Arenas
Athletic Courts
Bowling Alleys
Recreation Centers
Skating Rinks
Swimming Pools

Transportation
Air Traffic Control Towers
Aircraft Hangars
Airport Terminals
Bus Stations
Parking Garages
Rail Stations
Transportation Terminals

Medical
Assisted Living Facilities

CIVIL, INFRASTRUCTURE & LANDSCAPING

Civil
Airport Runways
Bridges & Culverts
Canals
Cemeteries
Dams
Demolition
Flood Control
Pavement Markers
Railroads
Reservoirs
Roads

Site Work & Landscaping
Athletic Fields
Excavating & Grading
Fencing
Parks & Landscaping
Sitework

Water & Sewer
Municipal Water and Wastewater Facilities
Sidewalks, Curbs & Gutters
Water and Sewage Piping

2.8 Communication in Construction Industry

2.8.1 Defining Communication

Communication can be viewed as a metaphorical ‘pipeline’ along which information is transferred from one person to another (Axley, 1984). It is the life blood of any system of human interaction as without it, no meaningful or coherent activity can take place (Thomason, 1988:400). Nonetheless, defining ‘communication’ is difficult as it is such a multidimensional and nebulous concept. It can have a variety of different meanings, contexts, forms and impacts and so will mean different things to dissimilar people in different situations.

2.8.2 Interactions during Construction

Communication and information management is a prime activity in construction. The entire construction process relies on vast quantities of communication being generated, transmitted and interpreted to enable a project to be built, maintained, reuse and eventually recycled. More specially, construction industry participants are concerned with information exchange, dealing with drawings, specifications, cost data, programs plus other design and management information required for the successful completion of a building. Successful knowledge-based organizations have been shown to rely on the effective transfer of information (Winch & Schneider 193, Boisot 1998), and similarly good relations within a team or group are dependent upon effective communication. (Emmitt and Gorse 2003).

Communication within project-based environments presents special challenges within the construction industry, where unfamiliar groups of people coming together for short periods before disbanding to work on other endeavors. (Dainty, Moore, Murray.2007)

Construction teams are loose grouping of interested parties brought together for a specific construction project. The team is composed of specialist operating ina disaggregated sector, each carrying different values and intentions to other team members. (Emmitt and Gorse 2007).

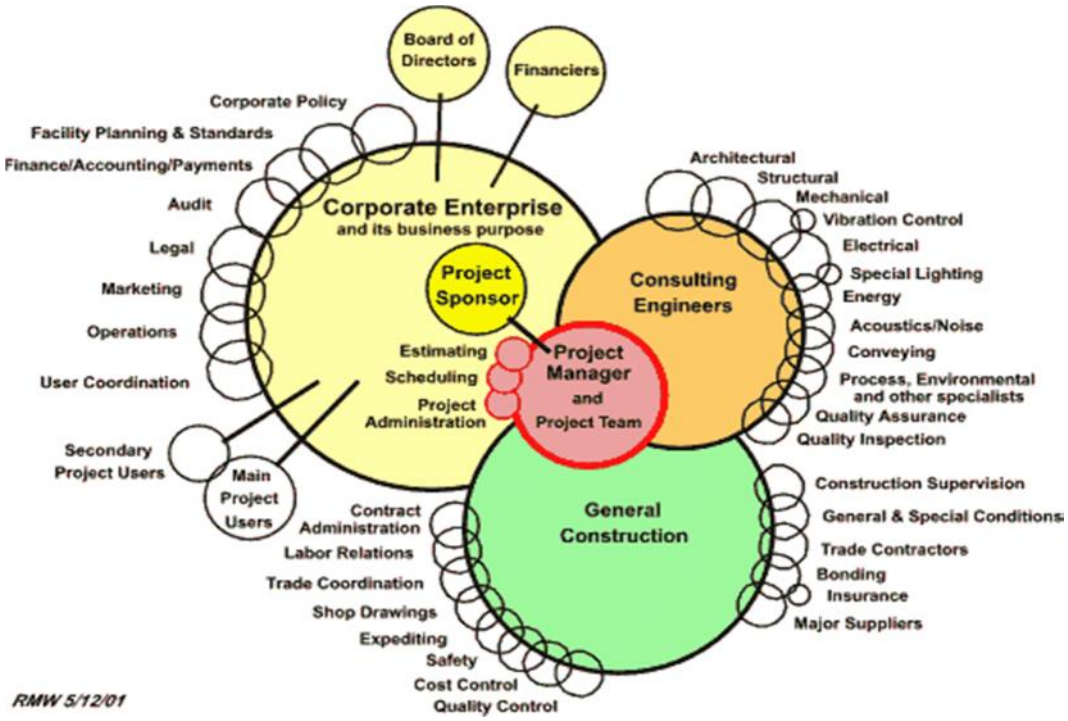


Figure 2.8 Construction team and duties (http://librarily.com)

2.8.3 Group Development within the temporary project team

Thus, the construction team is in effect a loosely coupled arrangement of interdependent teams, groups and individuals all contributing in different ways and at different times to the realization of specific tasks. In the vast majority of construction projects the participants are brought together to work on one project only. On completion of the project, or more accurately on completion of a participant's particular work package, the relationship between the individual and the project stops. (Emmitt and Gorse 2007).

The small teams and, groups and individuals that constitute the construction team are dominant at different stages in the project. Thus, although interdependent upon the work of others, may of the participants will not meet other participants during their period of involvement with the project. Relationship form, evolve and disband throughout the lifecycle of the project. (Emmitt and Gorse 2007).

2.8.4 Communicating to achieve project objectives

All actors need to collaborate, share, collect and integrate significant amount of information and knowledge to realize project objectives. (Pietroforte 1992: Oxman 1995)

To do this well requires a combination of good management, committed people, supporting ICT network and the opportunity to regularly communicate on face-to-face basis. (Emmitt and Gorse 2007).

A considerable amount of information can be processed at remote locations, for example in the office where all the tools, equipment and information are handled, and information produced can be easily sent via email or web-based technology.

When the information is simple, easy to understand and non-contentious, face to-face meetings may be unnecessary and wasteful. (Emmitt and Gorse 2007).

2.8.5 Communication research during the construction phase

Loosemore (1996a) investigated the patterns of communication and social structure that develop as a response to a crisis of communication phase. The actors observed included clients, estates department representatives, project managers, Architects, client's quantity surveyors, contractor's project managers and quantity surveyors. The research examined integration that developed following a crisis and used social network analysis to examine data gathered through participants' reports. Loosemore found certain patterns in communication behavior and interaction. Communication networks emerged out of a need for information to overcome a crisis. Construction crisis results in conflict that discouraged collective responsibility and reduced the effectiveness of the communication network. (Emmitt and Gorse 2007).

2.8.6. The importance of effective communication

There is a wide spread of stakeholders involved in conceiving a building project through typical stages such as design, finance, build, manage, upgrade and, ultimately, replacement and a corresponding need for communication and cooperation.

The construction industry provides a typical example of an environment in which communication plays a significant role and, moreover, is considered to be an invaluable requirement in order for businesses and professionals to function properly. The key reason that communication is pivotal in the construction industry is because the industry is dependent upon large amounts of information being transmitted, especially at a rate of intensity and efficiency to meet the demands that many construction businesses require in a highly competitive market (Tam, 1999; Chen and Kamara, 2008).

Communication on a construction project would require contractors, employees, colleagues and clients to consistently communicate in order to work towards achieving the objectives of the project (Sommerville et al. 2004; Heyecan and Sima, 2010). More specifically, this would include a range of professionals from project inception, right through to completion, which may include designers, planners, architects, builders, engineers and various others (Heyecan and Sima, 2010; Aladeloba et al. 2010). Considering this vast range of professionals, the need for good and timely communication becomes yet more important, as different professions, each dealing with certain aspects of a project, overlap in terms of understanding and levels of competence. Professionals been interviewed to get feedback about problems and solutions in language skills for different disciplines in the construction field.

There are generally three forms of communication that take effect during, for instance, a project. These include:

Oral communication – spoken messages (face-to-face, telephone, presentations, meetings)

Written Communication – (emails, letters, fax, memos, plans, legal documents, reports, manuals)

Nonverbal Communication (Heyecan and Sima, 2010, p.12)

Burke (2003), the forms of communication, refers to non-verbal communication as

"… the conveyance of powerful messages in the business world by means of gestures, appearance or attitudes" (p.5). Furthermore, an additional category 'Electronic Communication' is added as another form of communication. Many companies based in the construction industry have adopted the use of more technological methods such as electronic communication and Information Technology (IT) (Sommerville et al., 2004). The introduction of technology is seen as a tool which can improve the efficiency and effectiveness of communication and the rates at which it can be stored and transmitted (Mohamed and Stewart, 2003). This discuss in case study Stage B.

Another way in which construction professionals are able to more easily communicate with each other is through the practice of standardization as discuss in objective 02 of this survey. This refers to the process of applying uniformity through a number of areas of practice in order to achieve a level playing field in terms of interpretation and understanding (Burke, 2003; Harris and McAffer, 2006). This can be implemented through certain guidelines of practice, for instance, British Standards/International Standards and Codes of Practice or the use of dimensional scales; for example, the consistent use of metric or imperial scales for the interpretation of construction drawings, highlighted in objective 02 of this study. Such uniformity can improve the communication of information and can minimize misinterpretation. Burke (2003) lists some further benefits:

Less variation in documents, the easier handling of records, Simpler training, Easier communication planning and control, Better utilization of documents (Burke, 2003, p.2).

It is clear that construction professionals must organize their businesses with significant attention and consideration to the methods they adopt to communicate with others. There are numerous methods available, both traditional and the more modern innovative forms. However; it is imperative that communication is of a high quality because the information conveyed needs to be transmitted to a large audience. Different professionals from various areas of construction often need to combine their skills and knowledge when working together on projects. It is also important that such

information is carefully communicated, to potential clients, partners or other contractors, because it could make the difference between the success and failure of a project or business venture.

Meetings are a very powerful aid to effective communications and managed professionally they are key to the effective transfer of information between project participant while also providing mechanism through which relationships are formed and socialized. (Emmitt and Gorse 2003). But meetings consumes a vast amount of time and resources. Because the importance of meetings, they need to be managed professionally. Organizations use meetings to exchange information, discuss challenges and opportunities, and generate ideas and make informed decisions. Meetings can be classified as one of two types, either 'internal' or 'External' to the organization.

2.8.7 Causes of ineffective communication

Ineffective communication has been identified as a problem that can lead to conflict and subsequent litigation. Analysis of legal cases has shown that building failures can be traced back to a mismatch of knowledge and expectations (Lavers 1992).

Poor communication may result in a quality of service delivery being below the specified standard and may also result in buildings that fail to meet the specified performance requirements. (Emmitt and Gorse 2003).

1. Poor pictorial representation

Projects are often depicted by sketchy, incomplete, inaccurate and un-correlated drawings and charts making it difficult to be priced let alone be constructed. This issue discuss with the questionnaire survey in question no.02 schematic level.

2. Poor written media

Reports, letters, specification, schedules and bill of quantities when badly written, create difficulty for projects, faced with disputes and impossible to complete on schedule. This issue discuss with the questionnaire survey in question no.06 in tender stage.

3. Inadequate communication equipment

This problem may vary from bad telecommunication networks to ineffective postal service. Also, ineffective and frequent interruptions in power supply may generate further issues when messages cannot be communicated via e-mails or fax during a power outage. Most of the telecommunication networks lack clarity where messages received via telephone are frequently misconceived. This issue discuss with the questionnaire survey in question no.08 and case study in construction stage.

4. Education and training

Many site operatives cannot speak or understand English language. Hence in such situations their mother tongue should be used to work with them and to give information. Some workers may not possess required literacy levels or not trained adequately to read drawings and written information where verbal explanations may be the only mode of communication. This issue discuss with the questionnaire survey in question no.10 as solutions to the problem.

5. Incompatibility

Since individuals have diverse cultures and varied groups may assimilate and interpret differently.

6. Failure to discuss

This is an adverse effect of pointing up imaginary words of silence that prevents healthy dialogues and problem solving among groups. This issue discuss in case study stage C.

7. Jargon

Different people in different departments or sections of the same organization may speak in different languages, preferably the mother tongue of the majority although all of them can communicate in English effectively.

2.9 Professional Engagement and Procurement

A number of procurement systems have been developed. The four main forms include traditional, design and build, design and manage and management contracts (NEDO

198). Although traditional contracts are still the most popular procurement method, there has been a reduction in the number of traditional contracts and growth in design and build procurement methods (Gameson 1992: Langford et al. 1995)

Research on professional interaction in live that communication does not always follow formal channels (Pietroforte 1992: Hill 1995; Loosemore 1996a). Formal communication channel may be found to be ineffective, and the procedures and contract that govern and determine their structure and inefficient to deal with all circumstances (Hill 1995). Professionals use informal communication routes to achieve their objectives. (Emmitt and Gorse 2007).

2.9.1 Construction Progress Review meetings

The purpose of the Construction Progress Meeting is to discuss/review all pertinent project information with the client. The client, client representative or project manager, team members from the general contractor, the design firm and Consultants will attend these meetings. Construction progress meetings may require decisions to be made and so it is important that they are attended by sufficiently senior individuals if delays are to be avoided.

(Gameson 1992) noted that different emerged in the content interaction when actors were engaged in discussions with the clients: the professionals concentrated on issues more related to their profession. Not unexpectedly, each professionals concentrates on their own area of subject specialism and seems to devote little attention to understand other aspects of work.

The construction meetings' interaction is compared to previous research undertaken in other contexts. Differences were found between the interaction patterns of work, social and academic groups. Typical of the interaction previously observed in work groups, the participants in construction meetings use high levels of task-based interaction and low levels of socio-emotional interaction. The adversarial environment often associated with construction was not found, indeed the level of

negative emotion and critical discussion was so low that it could be suggested that problems may pass unchallenged. (S. Emmitt and C. Gorse Nov.2007).

Verbal interaction, while at the same time recognizing that body language and facial expressions provides important information in helping to understand the meaning of the verbal message. The physical observation of group interaction is considered important: it assists the researcher's interpretation of messages and their meaning. (S. Emmitt and C.Gorse Nov.2007).

2.9.2 Misunderstandings and conflicts within the team

Essentially, conflict arises when parties consider two or more competing options, responses, or courses of action to satisfy a particular event or situation or when the involved parties perceive a threat to their needs, interests, or concerns. The construction process is rife with uncertainty, and uncertainty creates fertile ground for conflict. One's ability to effectively deal with people, elicit their cooperation, and resolve conflict can be critical to the construction project's success, refer to objective 01.

In many construction situations, production may trump protection. In other words, safety takes the backseat when production is in jeopardy. This can create a situation where the person who tries to ensure safe operation may be faced with people responsible for production taking risks, which increase the possibility of injuries while performing the work. Conflict has both positive and negative consequences. This could very well have its roots in knowledge as well as situations. Having a good understanding of the other person's basis for their position, their needs, and their past experience may go a long way in finding a means to approach and resolve the issues in an amicable way.

A construction crisis stimulates a network of communications within its host organization, the structure of which influences crisis management efficiency. It does so by determining the effectiveness of information transfer between project participants, and thereby the level of uncertainty, misunderstanding and ultimately conflict which materializes (Loosemore 1998)

2.9.3 Crisis management within a team

The elemental approach is one that will foster resolution, address the issues symbiotically, and combine honesty with empathy, reason with intuition, and emotion with logic, as well as a willingness to align goals with the intent to have them work synergistically. This is also a learning process, and those open to flexibility and willingness to collaborate will gain trust, increase goodwill, build relationships, and solve problems effectively. (Gary 2000)

Efficient information flow is important to the reduction of uncertainty which, in run, is important to the reduction of misunderstanding, disjointedness, disagreement, frustration, tension and ultimately conflict. Efficient information flow is important to the speed and appropriateness of response to a crisis. (Loosemore 1998)

2.10 Group Interaction

2.10.1 Multidisciplinary groups and organizational communication

Multi-disciplinary groups are useful in addressing the increasing complexities of construction projects. Such teams must be carefully chosen and coordinated to maximize value and minimize problems. This is specially so in Public Private Partnership (PPP) projects, since there are more stakeholders, multiple success criteria, longer time horizons, and greater risks in procurement and delivery. Multiple functions must be addressed by disciplinary specialists from the same PPP consortium, e.g. in financing, in operations, as well as the design and construction functions.

Multidisciplinary groups are groups of professionals from diverse disciplines who come together to provide comprehensive assessment and consultation in problems. While their primary purpose is typically to help team members resolve difficult cases, teams may fulfill a variety of additional functions. They also enhance the professional skills and knowledge of individual team members by providing a forum for learning more about the strategies, resources, and approaches used by various disciplines.

Teams are also likely to identify systemic problems that can be addressed through training or coordination.

Bell's (2001) work on multi-disciplinary team discussions found that high levels of task interaction, ranging from 83-93%, typified the discussions. when the proportions of giving information, opinions and suggestions was compared with asking for information , opinions , suggestions, all of the professionals except one gave, rather than asked for information. Such observations are consistent with studies by Gameson (1992) and Gorse (2002).

When individuals work in groups to solve problems they need to use their individual knowledge to inform the group decision-making process. The group must access and discuss all relevant knowledge possessed by the group and use their combined skills to evaluate the information and arrive at the best decision. (S. Emmitt and C. Gorse Nov.2003) Language skill is essential in group communication.

The way a group develops interaction will affects the group's ability successfully to discuss tasks, evaluate proposals and maintain relationships. Recognizing group dynamics, building and maintaining groups, facilitating intergroup and inter organizational communication, encouraging and incorporating feedback from groups consider in group communication networks. (S. Emmitt and C. Gorse Nov.2003). This discuss about the objective 04, solutions to language skill problems by communicating with experienced team members and work under experts.

2.10.2 Group Development and group norms

Group norms develop through explicit statements by supervisors or co-workers, critical events in the group's history, primacy, or carry-over behaviors from past situations. (Feldman1984)

The importance of group and team development is well documented in management literature and new developments in team work strategies have become an important theme in management literature. (eg. Druker 1995, Hartley 1997). Construction relies

heavily on the co-ordination of many different specialist and this is usually referred to as a team effort, with the project being the focus.

Communication between the management and design during the construction process is, for the most part, a function of a group interaction, individual's work, within small groups in their own organization and with other, complimentary groups in different organizations, combining their skills and knowledge to achieve the project outcome through coordinated activities. (S. Emmitt and C. Gorse Nov. 2003).

Dimbleby and Burton (1992) simply states that group communication occurs within groups of people and by groups of people to others. Other researchers suggested that individuals forming the group need to share common attributes, goals and / or interest (or at least have common value of norms of behavior) for communication to be effective.

Getting a proper individual training to gain technical and occupational competency by working under experts in the field by group interaction which discuss in objective 02.

Construction projects are multi-disciplinary, in that they bring together professionals with different specialist knowledge from different organizations to ensure the various aspects of a project are achieved within the project parameters. (S. Emmitt and C. Gorse Nov.2003). This is related to the Objective 04, solution to language skill problems and objective 02, solution to lack of occupational competency.

Norms are often the least visible yet most powerful form of social control that can be exerted on a group.

It is essential for new comers to observe the communication behaviors and practices of other members, so that they can understand the group culture and participation in it. This is a period of socialization and acceptance. When new group form they establish beliefs, values norms, roles and assumptions that are specific to the group.an individual actions and behaviors are also influenced by his or her motives for membership, positions and role (Zahrly & Tosi 1989).

2.10.3 Group participation and interaction

When the groups or individuals meets at the first time, they arrive with certain assumptions about the roles of the various participants, which will vary according to why the group has formulated (Bentley 1994).

Wallace (1987) found that different communication tactics were used in in order to control specialist contributions. His observations of construction design team interaction found that participation is a function of the group's characteristics, with participation varying in relation to the way the group develops.

Group members must undertake roles to ensure that task and maintenance goal are maintained. A study of interaction leadership traits by Heinicke and Bales (1953), found that individual who held high status would participate and contribute the most during early meetings, with their contribution reducing in subsequent meetings.

Expert knowledge, experience could help to maintain efficiency in project work, referring

Clampitt and Downs (1983, 1993) note that intuitive links between communication and productivity make sense. Organizations require different approaches to their employee communication which are contingent upon their size, culture, management style, resources, staff and market conditions (Kitchen 1997).

The most popular theory on group interaction is Tuckman's model f group development. Tuckman (1965) suggested that there were four stages of group development, being: Forming, Storming, Norming and Performing.

2.11 Summary

The literature review reveals background study to the construction industry in Sri Lanka. It also discloses the importance of the growth of the industry which is eminent as it contributes to the national GDP and provides employment. It also confers strengths, weaknesses, opportunities and threats in the sector which directly has an impact on the economy of the country. The Construction Industry Development Authority (CIDA) and its activities towards construction in the country and the issues faced by the industry are also briefly discussed in this chapter. Furthermore, project team, classifications and building construction project process are too discussed in detail in this chapter to clarify procurement process in building construction.

Communication in construction industry is broadly discussed including group development, group interaction, team building and communication channels in a project that is required to create effective communication within a team.

CHAPTER 3

CONSTRUCTION PROJECT CULTURE

3.1 Introduction

Project culture is very important for the processing of construction projects. It improves behavior/attitude of the project participants to create a positive project flow. Similarly, the value of the client/project also will be improved. Project administration, project management and organization of the project work and team with effective communication channels will influence the successful completion of a project.

Characteristics of a project manager in line with coordination, monitoring and controlling skills of work, resources and human resources are explained under this topic in detailed.

Building a project team and organizing the structure of the team which strengthen the effective delivery of a given task is described under sub topics in this chapter. Relative issues from other countries are also discussed to help arrive with suggestions to enable effective communication within the team.

3.2 Management of a construction Project

A unique set of activities must take place to create a unique product as in construction projects where an exquisite creation is represented by the building itself. Several criterions must be met to determine the success of a project namely cost, time, safety, resource allocation and quality which are determined by the building owner. The sole purpose of Project Management is to achieve these goals and objectives through the strategic expenditure of resources that can satisfy that meet the project's quality, cost, time, scope, and safety requirements of the project. The Project Manager should be capable of controlling, deflecting, or mitigating the effects of any prevalence and conditions that may have a negative impact on the success of the project.

3.2.1 Project Administration Issues - Government Client

a. Economic issues

Funds for developments of different government institutions are given by government agencies which are generally funded by the central budgetary allocations on an annual basis. Since these budgetary allocations are constrained problems surface frequently hence construction projects tend to take an approach inclined on cost instead of the design to complete the projects.

b. Time Constraints

Time has a monetary value to all stakeholders - owners, builders, and users of the constructed project - alike. The perception of the Government Institutions is mainly focused on lost revenue due to not receiving return on investment, cash flow crisis, legal issues due to delays as well as negative social impacts.

Prolonged overhead costs and critical cash flow in auditing are resulted due to delays in completion. Furthermore, extended project durations will impose a negative impact on the bonding capacity and ability to bid more work resulting in an opportunity cost to the contractor. Inefficient time management also leads to higher labour and equipment costs. Specifically, in negotiated work a reputation for late completions is bad for securing future work.

c. Environmental Issues

In the world, today issues related to impact on environment is at a steady rise due to construction industry. Both, owners and constructors are liable to clearly define duties and liabilities regarding minimum impact on the environment. Almost all segments and sectors of the industry are found fault with one or more environmental issues such as creating mosquito breeding spots in water stagnating areas which is a cause for a major health hazard at present, ground covers and plants getting affected in construction sites due to long term exposure to dust and material storage, irrigation and water drainage problems…etc.

d. Governmental Regulations

Recurrent and persistent change in government regulation is a core challenges faced by project administration today.

Imposing of more environmental and safety laws, the construction industry is faced with superior regulations with the imposing of construction codes and licensing requirements. Hence, permitting requirements, contractor licensing laws and the costs associated with them are also escalating. Since project delays are unavoidable due to waiting for inspection to be in par with quality of code administration is also a major concern.

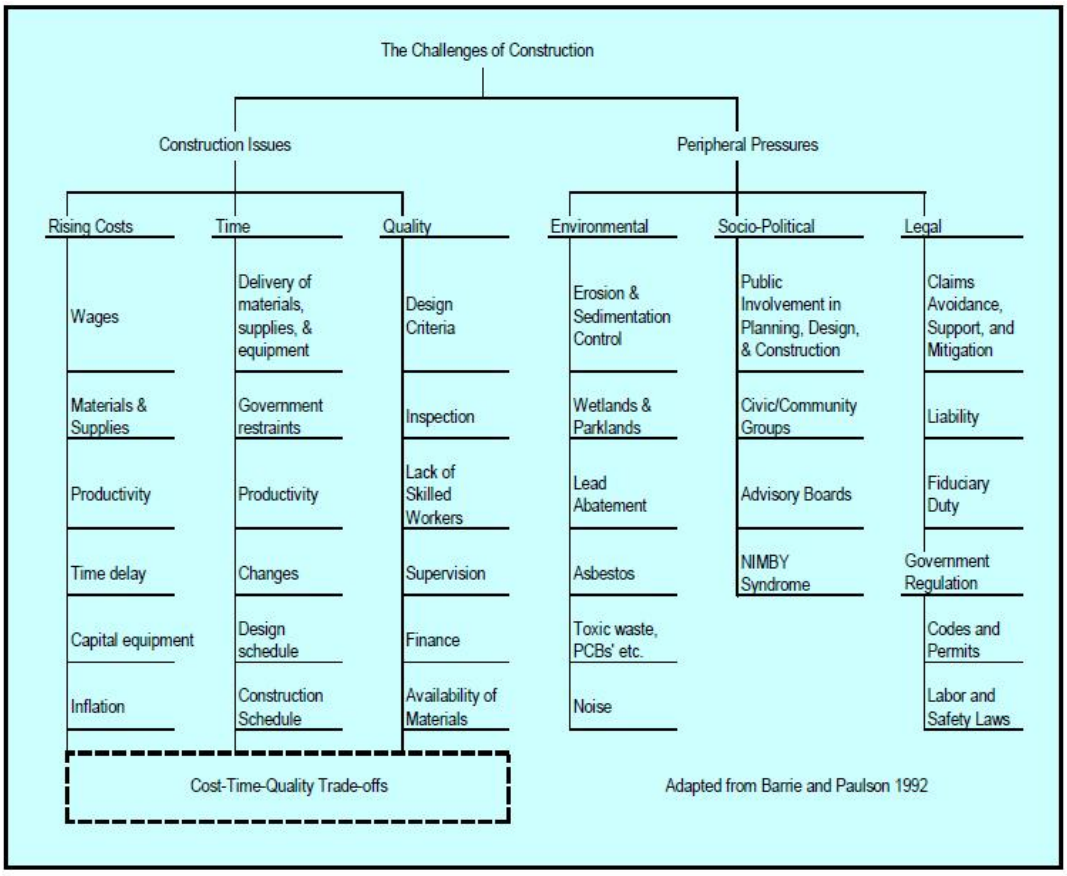


Figure 3.1 The Challenges of construction.

(Muir, B. 2015, http://www.constructionforum-myanmar.com)

3.2.2 Project organization and project team

The structure of a project team changes throughout the extent of a project and may also comprise of many different members.

Since the nature of the project team change over time, it is essential to conduct several start-up meetings as and when new team members join the project. It is important to establish correct roles for each team member since they have direct impact on the project which can be either constructive or destructive. It is obvious that constructive roles advance the team and the project towards accomplishments and positive results, whereas destructive roles deter achieving the set-out goals.

The following is merely an indicative, outline structure for a traditional project.

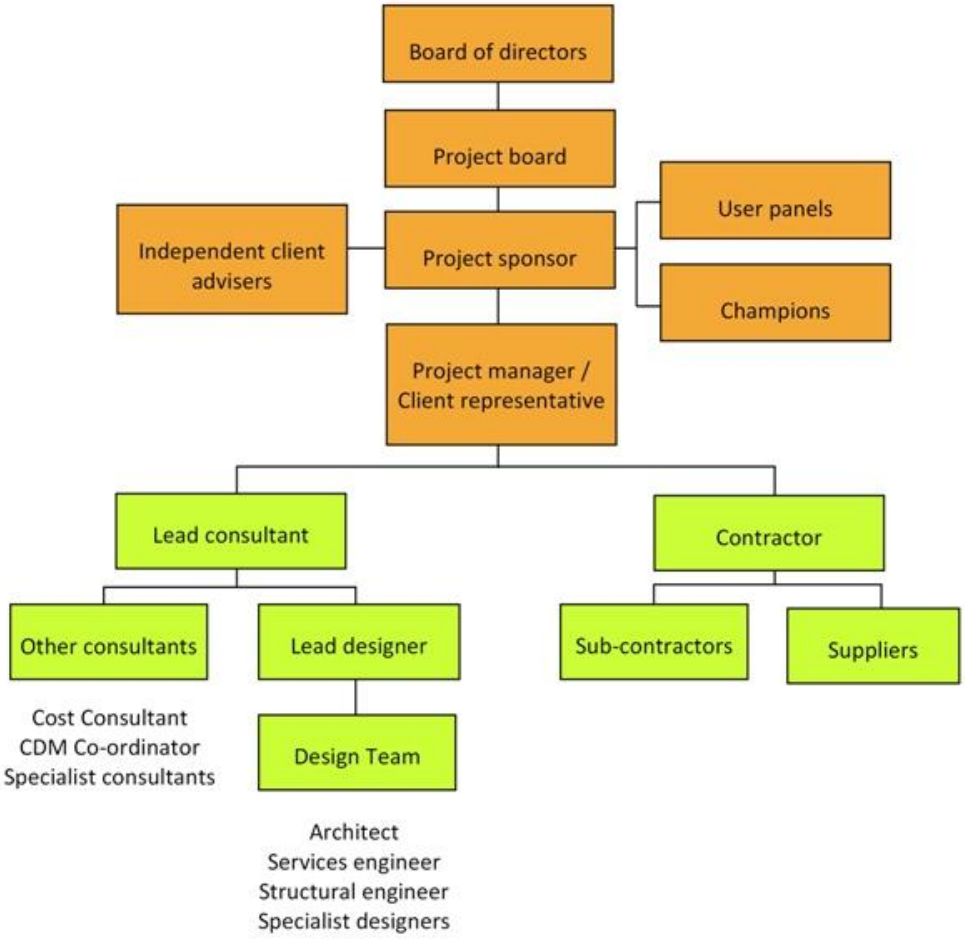


Figure 3.2 Traditional – project structure
(https://www.slideshare.net)

3.2.3 Line of communication

Effective communication is a vital factor to create any fruitful project and similarly essential to achieve the completion of any successful construction project. Competent communication skills can enhance teamwork that can lead to better project alliance. Misinterpretations, delays and complications are unavoidable due to poor communication throughout the project.

On any construction project establishment of clear and precise communication routes are necessary to determine a chain of command. Such details are clearly indicated in the contract documents and generally entail both the owner and general contractor to maintain communication between each other through the architect. It is the responsibility of the architect to communicate with other consultants. The general contractor is responsible for communicating the necessary information to the suppliers and subcontractors. The site supervisor / Clark of works on each project is the general and main basis of contact for the general contractor.

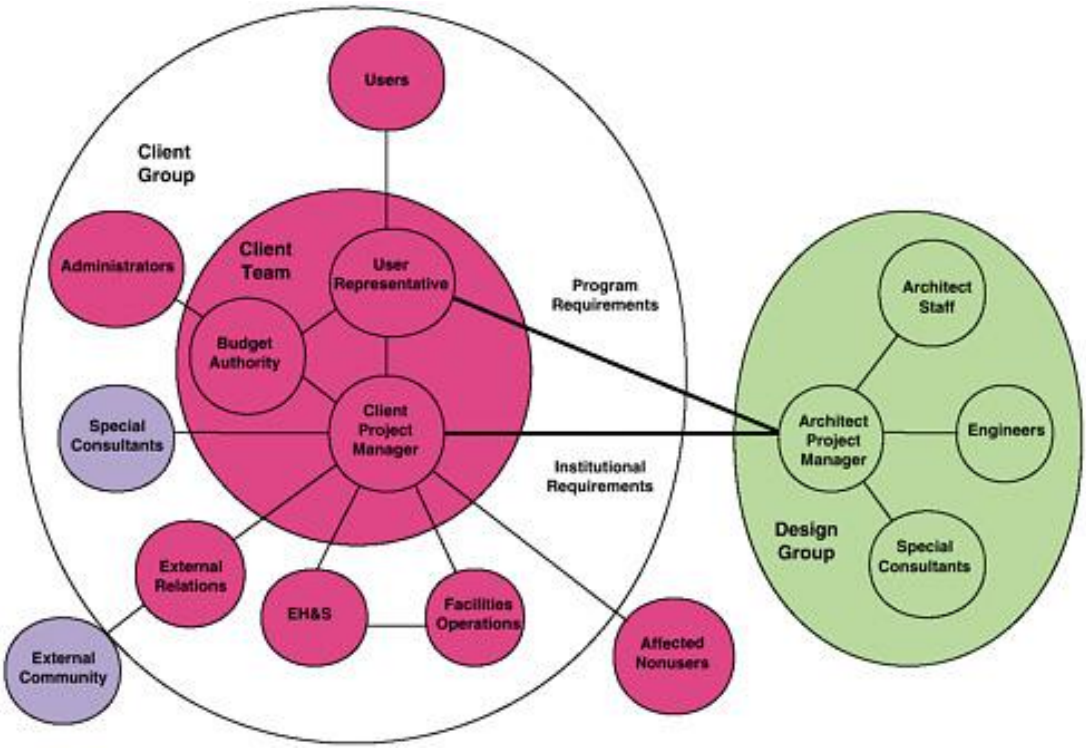


Figure 3.3 Project communication channels (www.smartsheet.com)

The modes of communication for any construction consist of contract documents along with drawings, specifications, change order forms and requests for information. It is vital that any direct communication which is not delineated in the contract documents receives suitable authorization prior to commencement. It is also necessary that changes to the scope or schedule required are documented and reported through proper channels.

Skilled communication brings out proper results. A project team being more communicative and transparent more effective the team leading to better results. Elevated levels of communication in projects teams are capable of delivering projects on time or even ahead of schedule, within or under the stipulated budget and with extraordinary safety records. Such results are not random but are the outcome of clear, concise and transparent communication.

3.2.4 Characteristics of project Managers / Leaders

The role of a project manager consists of many characteristics such as exceptional leadership quality, sharp listening ability, integrity, ethical behavior, consistent, strong at building trust, effective verbal communication, strong at building teams, impartial conflict resolution & conflict management, critical thinking, problem solving, proper understanding and balancing of priorities.

a. Excellent communication skills.

It is essential for a project manager to possess clear and concise communication which will improve management of the team. Effective managers are capable of clearly articulating a vision and the intent of a project. They also excel at lending ideas and discovering potential solutions that help clear off challenges faced by the construction team. Effective communication of project managers is recognized and learnt by his team members. The proper tenor required for effective communication is instilled by appropriate project management which is responsible for diverse set of positive results.

Communication allows feedback circles among all team members. The high-performing leaders identify and provide feedback and encouragements on staff performance to achieve further improvements. The identification and communication of pros and cons of the performance of an employee is constructive and emphasizes growth that helps build up both the individual and his team.

b. Integrity

Genuine commitment and proper demonstration of ethical practices are key features of good leadership. Hence a project leader holds the responsibility of forming standards and carrying duties accordingly. A project leader also must also identify and reward the team members who demonstrate similarly. However, if motivated by egocentric leadership such will destroy the wellbeing of the team that may lead to a disrupted project ending. Leadership is strongly bound to integrity. It is a representation of set of values that are shared among all team members leading to reliable behavior enriched with values and dedication to honesty with oneself and team members alike. It is not an exaggeration when a leader is recognized to "walk the talk" which in return earns the trust of the whole term.

c. Competence

Though in the past the technical expertise played a significant role, today the ability to successfully lead others plays a solid share when selecting a good project leader. However, a clear record of successive projects is the guarantee to be considered competent in the task. Strong leadership skills also assure competence and a capable. Furthermore, a competent leader also must demonstrate the ability to challenge, inspire, enable, model and encourage.

d. Team-Building Skills

A leader must always be able to bind the team together for a collective purpose to obtain the required objective. The leader must understand the process and dynamic forces essential for a transformation that is required by the team to grow from a group of strangers to a single unified element. The leader must identify the appropriate leadership style that should be used during each stage of the development of the team suited to the ability and the expected outcome from each team member. This

understanding of the styles of each team player and way to capitalize on each one on time is essential to face the problem at hand during the whole project.

e. Problem Solving Skills

Leader is expected to share problem-solving responsibilities with the whole team. Each team member should have a "fresh, creative response to here-and-now opportunities," since each of them do not care as how others have performed as much as their own response and performance. (Kouzes 1987).

f. Enthusiasm

Undivided commitment in achieving the goals and displaying of this commitment through optimism is essential for an enthusiastic leader. Optimistic expectations are always welcome by others where leadership expresses the confident in the commitment to a project. Successful leaders are aware that enthusiasm is contagious and the positive impact it has on creating a thriving project.

Table 3.1 Project manager's skills

Project manager skills and competencies	Project manager work (view of the project sponsor)
Integrity, ethical behavior	Project planning
Decisive	Communication with project sponsor
Leadership	Setting clear project objectives
Listening	Establishing and maintaining communication with key stakeholders
Verbal communication	Monitoring and controlling

3.2.5 Coordination, Monitoring and Controlling

Compared to other industries the construction industry is generally characterized with high fragmentation, low productivity, cost & time overruns and conflicts.

To maintain productivity and quality of the product, supervision by professionals is crucial for the product to be delivered within the procurement process.

In order to improve construction performance in a construction project proper coordination is mandatory where team communication and effective communication skills are key factors.

It is important to carry out periodic supervisions and monitoring project work from inception to completion to maintain stipulated standards and regulations.

Diverse types of technology can be used in different disciplines of work phases to address risk of cost overrun, delays to deadlines and quality measures from the inception of the project.

3.2.6 Effects of construction project management

It is strongly proclaimed that a context within which the leadership occurs has an impact on the level of leadership desired. According to the type of project being delivered, that project manager skills & competencies associated with project management and skills & competencies associated with project leadership could be utmost efficient when combined.

Skills and competencies of the Project Manager may not effectively reflect on some of the most important aspects of the project. This is mainly due to distinctive characteristics particularly relevant to each project which is delivered in an ever-changing business environment. Hence different combinations of skills and competencies may be significant depending on each project.

Experience is a key feature herein where matured project manager skills in utilizing management tools efficiently to evade cost, quality, time overruns during the project period. Some of such important aspects are eliminate non-productive meetings, solve identified issues early, quickly and effectively, conduct team training programs to improve skills and periodic updates of lessons learned.

Project leadership is becoming more significant to the project management arena as stated in literature. Thereby *Kotter (2001)* stated the two significant roles of each realm as *while management is about effectively dealing with complexity, leadership involves dealing with change.*

3.3 Project Manager's Role in Construction Project

The individual responsible for delivering the project is known as the project manager. To ensure that all relevant goals are met the Construction Project Manager is assigned to the project sponsor. The ultimate responsibility for all aspects of the building project is held by the Construction Project Manager hence his part is the most significant and crucial. He must also work closely with architects and engineers throughout the whole building process.

The role of the project manager comprehends many obligations such as Planning & Defining Scope, Activity Planning & Sequencing, Resource Planning, Developing Schedules, Time Estimating, Cost Estimating, Developing a Budget, Documentation, Creating Charts & Schedules, Risk Analysis, Managing Risks & Issues, Monitoring & Reporting Progress, Team Leadership, Strategic Influencing, Business Partnering, Working with Vendors, Scalability, Interoperability & Portability Analysis, Controlling Quality and Benefits Realization. (Haughey 2016)

The responsibilities held by the construction manager are numerous and include the following:

a. Planning - From the commencement onwards, the responsibility of the Construction Project Manager must plan the building process, which means producing a critical path and understanding the timing of each stage. To ensure that the project is completed on time each phase of the project must be closely monitored.
b. Resource Allocation - All building projects vast or trivial need resources ranging from bricks and mortar to tools and basic services. The Project Manager is responsible to have an understanding of what these resources and ensure that they are available as and when required.
c. Staff Management – It is the responsibility of the Project Manager to engage a suitable team and assign necessary tasks to the relevant managers. One of the obligations is to identify a suitable contractor/s who can complete the work. The Construction Project Manager must understand and make a crucial decision as at which stage of the process each trade will need to be recruited.

d. Setting Benchmarks - Setting benchmarks to monitor progress is an integral aspect of the constant monitoring of the project. This allows the project manager to identify whether the project is on target to finish on time and within the stipulated budget or not.
e. Budget Management – It is the responsibility of the Project Manager to carry out the financial planning and monitor the project. The Project Manager should consider continuous forecasting, to prevent any additional costs to the allocated budget. Hence informing the team of forecasts and changes and managing the scope precisely, will indicate of any costs for unplanned construction work or resources that can be kept aside.

3.4 Building Project team and Organizational Structure

Project team is responsible for the production of products or services that is defined by the project manager within the constraints identified as time, cost and quality established by the board where the team reports to the project manager.

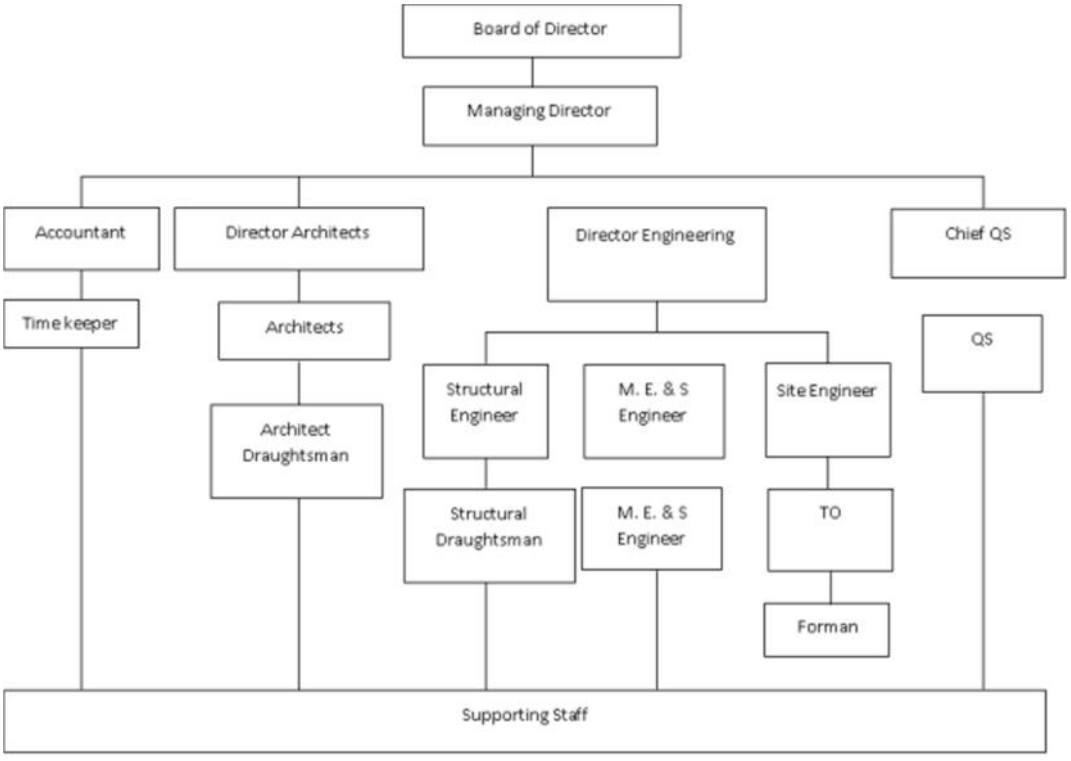


Figure 3.4 Building project –
Organizational structure of a Construction Firm including professionals.

3.5 Language, Communication Skills and Project Performance

To achieve the objectives of the project effective communication management within virtual project teams is of supreme importance as well as a fundamental competency. This should connect each member of the project team if accurately implemented hence they can work together for the achievement of a common goal. If the required communication is not accomplished successfully and entirely understood by the Project Manager the outcome of the project may jeopardized.

Sir Harold Emmerson (1962) noted that efficiency in building depends upon the quality of relationships between the Client, Professionals, Contractor and sub-contractors. (Emmitt and Gorse 2003)

An industry in which abortive work, misunderstanding, and delays resulted from failures in communications and division of responsibility. Conflict, confusion, doubt and error figure highly in their picture. (Emmitt and Gorse 2003).

3.6 Problems due to Communication Issues

Effective communication is a challenge often faced in the construction industry in a project-based environment. The construction industry is heavily dependents on effective communication between all stake holders whether individuals, teams or organizations. It is common that in a project-based industry, interaction between unaccustomed groups of people are required to work together for brief periods until the stipulated work is completed.

It also recognized that organizations are not static, and when communication flow is blocked, different organizational groupings develop compared with those when communication is integrated (flowing), the overall recommendation being that construction required collaborative leadership. (Emmitt and Gorse 2003).

Not only in the construction industry but in any business venture communication is an essential component that enables an organization to carry out its exertion. Similarly communication is a fundamental part of the construction process as well. It is

undisputed that improved communication can improve the operational efficiency of any organization. In a construction project, healthy communication within and between organizations can improve motivation among different stake holders which will enhance the processes. On the contrary, ineffective communication can lead to a demotivated workforce that will lead to complications in a construction project. (Christopher A. 2003).

Since all construction projects are complex and risky an active participation of all contributors and stakeholders are essential. In order to complete the project fruitfully co-operation and co-ordination of interpersonal and group communication activities are crucial. The basic cause of defects and deficiencies in most of the construction projects are identified as poor communication, lack of consultation and inadequate feedback. Shortcomings of the design information leads to design errors where ineffective co-ordination and communication of design have occurred. Communication is identified as the key aspect of project management that diffuses everything else. (Christopher A. 2003).

However, an effective communication requires the use of a sole direct sample language which is more efficient in the usage of any form of communication. Either verbal or written, instructions or orders given out in a simple language can be effortlessly understood.

As explained by Oyekunle (1996) the major problem faced by the construction industry is the ineffective communication. Ineffective communication has caused many delays in the completion of projects. Consequently, delays will lead to extension of time when necessary and the contractor will be charged liquidated damages if established responsible. This matter questioned from respondents regarding delay occurs due to ineffective communication.

In extreme situations dispute and arbitration, termination of contract or even complete abandonment of the project may occur.

3.7 Relative Issues in Other Countries

The ‘language problem’ has been an issue in various sectors in the entire world for an extensive period. The haste in the economics of a country attracts foreign workers from all around the world. Mainly in the construction industry, the need for foreign labor force is important due to lack of compatible local work force to carry out construction works. The involvement of foreign workers helps raise the economy of the country. However, issues related due to language that occur among foreign workers creates a needless problem.

Language diversity is a prominent feature of the Australian Construction industry. Non English Speaking Background (NESB) migrants fill a high proportion of low – level operative positions and naturally relevant to their first language in order to communicate with their colleagues. This creates linguistic ghettos in the work place which further inhabit integration and second language acquisition. There are many consequences for construction companies; one being in an inability to interpret message regarding workplace hazards conveyed by supervisors, managers and peers. (Trajkovski, Loosemore. 2005).

Loosemore and Andonakis (2007) explained that in Australia, the existing language problem among foreign workers affects activities involved in compliance with work safety and health. The result of Loosemore and Andonakis’ survey showed that about 13.9% of the respondents say that language is the barrier to effective implementation of work safety and health in the construction industry. Research carried out by © Centre for Promoting Ideas, USA www.ijbssnet.com 98 Trajkovski and Loosemore's (2006) revealed that in the construction industry in Australia that the language factor has contributed towards a high accident rate of 85.7% of the foreign workers since they use a language other than English at the work place. Trajkovski and Loosemore's research also proved that 48.7% of the foreign workers are unable to understand the instructions presented due to lack of understanding of English language. Also 66.7% of the foreign workers make mistakes in their work as they do not understand the instructions and the orders given.

In Singapore, Wah (2000) explains that critical language problem in the country contributes towards accidents that occurs at construction sites where most foreign workers are from Bangladesh, India and Thailand who do not understand the commands due to the lack of English or Mandarin languages. Furthermore, in the United Kingdom also, research conducted by Bust et al. (2008) revealed that the language problem exists among foreign workers in the construction industry. The research that was carried out in the United States by O'Connor et al. (2005) regarding young Latin construction workers revealed that workers face high injury risks because they have had less training on safety and health due to their inability to communicate in English.

Following the phenomenon of influx of foreign workers into the country since the 1980s the Language problem issue has been in Malaysia. It has caused various issues in the construction industry which has mainly increased accidents risks. This is endorsed by the research that was carried out by Haryati (2009) where perception of respondents was considered. Accordingly, 50% of the contractors agreed and 41% strongly agreed that the communication or language problem among foreign workers in the construction industry has a massive impact on the accident risks at a construction site.

The Gulf cultural identity, is most strongly represented in its language and religion. The official language is Arabic, a language which provides a very strong sense of collective identity to Gulf nationals. By language, is meant, not only the verbal prose which are associated with different dialects, but also the nonverbal (silent) cues which are associated with the way people present themselves in an act of communication. Paralanguage refers to how something is said rather than the content. The tone, inflection of the voice and rate of speech are all important in this respect, as is the cognitive route taken in conversations. This is understood by the Arabic culture and silence during communications carries strong connotations of disenchantments. Uninitiated westerners are unlikely to detect these subtle message s and become frustrated with the relatively high levels of silence and the cognitive loops which characterize Arabic conversations. In a similar way, the relatively high level of

individualism displayed by a UK national may Couse problems because Arab would tend to perceive it as being disloyal, dishonorable and selfish. (Loosemore, Muslmani. 1999)

3.8 Suggested Solutions

The above surveys suggested that if the employers provided their foreign workers with basic language training skills each work order and aspect of safety can be communicated effectively. This refers to the questionnaire survey question 10, 04.

Recommendations:

1. For speedy transmission of information adequate communication equipment should be provided.
2. The message, order or instruction should be reinforced i.e. should be presented in several ways or means until understood clearly by the workers.
3. The organizations should have a firmly established communication system and a strong line of communication for better communication efficiency.
4. Written communications should be appropriate and legible hence use of simple, direct language is essential avoiding jargons which is essential to avoid catastrophes.
5. To achieve an effective communication, an efficient post and telecommunication service should be available.
6. Superiors should not treat their subordinates with negative or low reverence that may prevents healthy dialogue and easy group problem solving.
7. Education and training programs should be organized by the employer to sustain well-qualified employees at all levels of work to overcome challenges. Such programs must include the information about the work involved while acknowledging the sources of information. This should enable the workers to be confident and capable of their own perception of work. Hence, they can effortlessly be aware of the efficient approaches that can be taken.

8. Workers should be encouraged to make use of feedback positively. Feedback allows obtaining information and evaluating performance to obtain collective actions where required. It also assists to determine the level of understanding of the receiver when the messenger gets back his own information through feedback. This establish the fact that, effectiveness of face to face communication is better than written ones.
9. The correspondent should adjust according to the receiver. Since the intention of the correspondent is to get the message across, he should be able to predict the impact that will be imposed on feelings and attitude of the receiver at the time of feedback. A clear perception should break the ice between the communicator and the receiver.

A need is identified to provide mandatory safety training in language other than English and to supplement this with translated print materials. (Trajkovski, Loosemore. 2005)

3.9 Summary

There numerous constraints and issues faced by a construction project is discussed in this chapter regarding budget, time, environmental aspects and governmental regulations when the Government tends to be the Client. Furthermore, changes that may be required in the structure of a project team throughout the extent of a project and the necessity in the line of effective communication is also elaborated. This part of the study also scrutinizes the contribution of the Project Manager in creating a language competent work force.

Therefore, the results of the study provide an employer's perspective regarding the workforce development programs that are needed to assist workers in obtaining language, basic skills and occupational skills to succeed in the workplace.

However, there are some limitations in this study. First, the relationships between communication problems and types of information in action have not been graded to figure out the biggest factor that causes communication interruption. Likewise, the applicability of the proposed solutions and recommendations for the identified problems are also not categorized.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents the research methods, process, design, questionnaire and the approach to address the research objectives as mentioned in Chapter one.

The process carried out to collect information and obtaining data for making decisions are also discussed here. The methodology will include case study, interviews, surveys and other research techniques.

A research is commonly considered as a crusade, a movement from the known to the unknown. However, the Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry especially through search for new facts in any branch of knowledge." Redman and Mory define research as a "systematized effort to gain new knowledge."

Research is an original contribution to the existing stock of knowledge created for its advancement. It is the pursuit of truth with the help of four main factors; study, observation, comparison and experiment. Briefly, the search for knowledge through objective and systematic method of finding solution to a problem is known as research. It is also identified as the systematic approach concerning generalization and the formulation of a theory.

4.2 The basic types of research

a. Descriptive vs. Analytical: Surveys and fact-finding enquiries of diverse kinds are identified as descriptive research includes. The foremost purpose of descriptive research is the description of the current concerns of the research. A common term used in both social science and business research is *Ex post facto,* research for descriptive research studies. The main characteristic of this method can be acknowledged as follows. That is, the researcher has no control over the

variables and he can only report what has happened or what is happening. *Ex post facto* research projects are utilized for descriptive studies where researcher pursues to measure such items as, frequency of shopping, preferences of people or similar data. Such studies also include attempts by researchers to discover causes even when they are unable to control the variables.

b. Applied vs. Fundamental: Research can be divided into two categories, namely applied (or action) research or fundamental (to basic or pure) research. Finding a solution for an immediate problem facing a society or an industrial/business organization is contemplated by applied research. Fundamental research mainly based on generalizations along with the formulation of a theory. *"Gathering knowledge for knowledge's sake is termed 'pure' or 'basic' research."* Examples of fundamental research can be either a natural phenomenon or relating to pure mathematics.

c. Quantitative vs. Qualitative: As the term depicts quantitative research is based on measurement of quantity or amount. Phenomena that can be expressed in terms of quantity can be applied with quantitative research. Phenomena relating to or involving quality or kind can be applied with Qualitative research. Qualitative research also includes attitude or opinion research such as research designed to find out how people feel or what they think of a specific subject or institution. Qualitative research is particularly vital in the behavioral sciences to discover the underlying motives of human behaviour. Also analyzing a range of factors which motivate people to behave in a certain way or which make people like or dislike a something can be obtained through qualitative research.

d. Conceptual vs. Empirical: Conceptual research is associated with abstract ideas or theory. To develop new concepts or to reinterpret existing ones, philosophers and thinkers commonly use conceptual research. Empirical research is based solely on experience or observation, mostly without due regard for a system or a theory. This type of data-based research is arrived along with conclusions that are accomplished with verified observations or experiments. It

is an experimental type of research in which it is necessary to obtain direct facts, their source and actively. Hence it allows the stimulation of the production with desired information. Here the researcher must form a working hypothesis or presumption the probable results. Setting up experimental designs which are believed to manipulate the concerned person or the material to acquire the desired information should be the next step.

e. Some Other Types of Research: There are many other types of research which are variations or combinations of one or more of the above approaches. They could be based on the purpose of research, the time required to accomplish research, on the environment in which research is done, or another similar factor. Regarding the time factor, the research could be either a one-time research or a longitudinal research. In one-time research, it is confined to a single period, while in a longitudinal research, it is carried on over several time-periods. Depending upon the environment in which the research is to be carried out it can be categorized into field-setting research, laboratory research or simulation research. Research also can be clinical or diagnostic.

4.2.1 Quantitative and Qualitative evaluation methods

The two basic categories that evaluation methods and the data produce are grouped in to are identified as Quantitative and Qualitative. Quantitative methods produce “hard numbers” whereas qualitative methods capture more descriptive data. From the above two methods, one may be selected as determined by the purpose of the evaluation and the resources available to design and conduct the same. However, as agreed by most researchers and evaluators, a combination of Quantitative and Qualitative techniques or a ‘mixed method’ produces an affluent and more comprehensive understanding of accomplishments and facts of a project.

There are different techniques to gather and evaluate Quantitative and Qualitative data:

Table 4.1 Quantitative and qualitative techniques

Quantitative Techniques	Qualitative Techniques
Surveys / Questionnaires	Observations
Pre / post tests	Interviews
Existing databases	Focus groups
Statistical Analysis	Non- statistical (methods vary)

4.2.2 Research process

To effectively carry out the research and the desired sequencing of the required phases research process should consist of series of actions or steps.

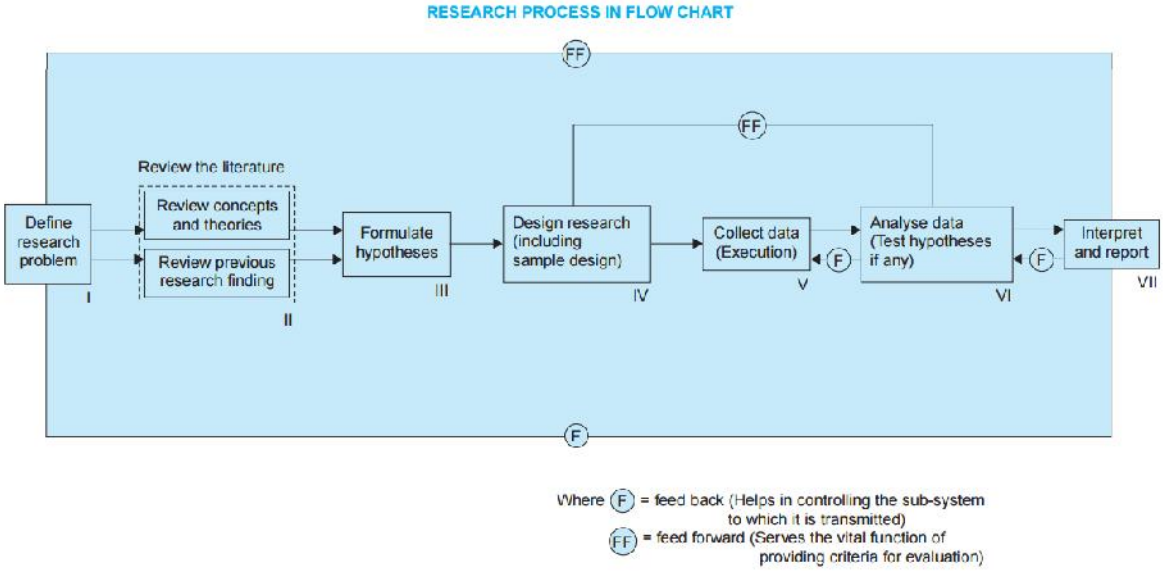


Figure 4.1 Research process

(1) Formulating the research problem
(2) Extensive literature survey
(3) Developing the hypothesis
(4) Preparing the research design
(5) Determining sample design
(6) Collecting the data
(7) Execution of the project
(8) Analysis of data

(9) Testing of hypothesis
(10) Generalizations and interpretation
(11) Preparation of the report or presentation of the results, i.e., formal write-up of conclusions reached

4.3. Selection of a research methodology

Distribution of Questionnaire, semi structured Interviews and telephone interviews can be conducted to collect data in the survey.

According to Blismas and Dainty, 2003 to gain a quality research a detailed examination of probable methods and methodologies available must be imperative. Choosing a suitable research methodology is a challenging task. As admitted by Goulding (2002) it is a time-consuming, laborious and difficult undertaking. However, it is also a personal and a reflective process which requires evaluation of convictions, beliefs and interests of oneself. Goulding (2002) also interprets research as a part of an integrated process involving beliefs and experiences of the researchers. The collaboration of numerous stakeholders involved in the research, as well as the suitability and implementation of a chosen methodology plays a vital role in obtaining proper results. It leads to an answer consisting a single perspective but not an absolute explanation of the problem.

Bryman (2007) explains the importance of the research question to choose a suitable research methodology. Hence it is explained that the research question is a crucial primary step that provides a point of 117 departure for finding the solution to a specific problem. It helps to link the knowledge of domain of the researcher to data that are collected to discover the required solution. Bryman (2007) also explains the way decision should be made according to the nature of the research question. It is further explained how research design and methods should be composed to answer research questions. Bryman's (2007) findings on interviews with researchers reveal that other reasons such as disciplinary requirements are considered as acceptable knowledge and policy issues. They are possibilities concerning the knowledge that is required for

policy and funding expectations. Hence it is obvious that the funding bodies also play a role in selecting the research methodology. Personal skills of the researcher to conduct the required research is another option. Thus, the methodological preferences of the researcher can be assisted to pick a specific research method. Accordingly, a quantitative or qualitative research approach, may be formulated.

According to Blismas and Dainty (2003), it is critical that the researcher substantiate the method chosen hence, providing a justification for the choice made for a research methodology. Trauth (2001) similarly emphasizes the factors that influence the choice of qualitative methods. They comprise the nature of research problem, researcher's 118 theoretical lens and the degree of uncertainty surrounding the phenomenon. Merely, a research method is an integral component of a wider, iterative, and coherent research system. Hence such unavoidable influences should be considered in deciding a research method.

4.4 Research Design for this Study

A design is used to structure the research; hence it can be utilized to illustrate how all the key components of the research project work together to address the fundamental research questions. However, there are no conventional ways in which qualitative research is written.

After clarifying the issue and suggested outcome of research subject matter, this study required to; comprehend what data is required, who to interview, how many to interview, what to interview and accordingly construct an appropriate interview with a choice of questions, order of questions and a choice between conversation or the structure type.

Then the survey is extended to discover which aspects of the data and which category of the team are more critically important in this study and the different solutions made by distinct categories of the team.

4.5 Case Study Methodology

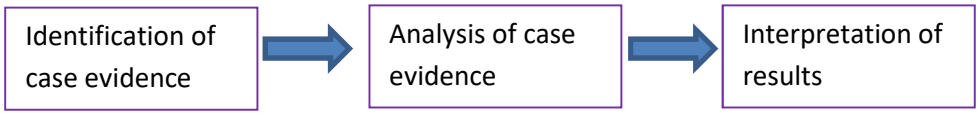
A case study is used in many situations as a research method. It contributes to our knowledge of individual, group, organizational, social, political and related phenomena. It has been a common research method in many subjects such as construction and economics. In any circumstance, the distinctive need for a case study arises due to the desire that requires understanding a complex social phenomenon. Additionally, a case study method allows investigators to recollect a complete and expressive feature of real-life proceedings.

The essence of a case study, the central tendency among all types of case study, is that it tries to illuminate a decision or set of decisions: why they were taken, how they were implemented, and with what result. (Schramm, 1971)

A case study may consist of a single case or multiple case studies depending on the situation. A single –case may be carried out instead of multiple-cases if the single case can represent the critical assessment of a momentous concept. It may also be possible that the investigator has gained access to a situation where a case was previously inaccessible to any systematic explanations. A case study is hence worth conducting for the descriptive information that will be indicative.

The sources of evidence are commonly used in doing case studies such as: documentation, archival records, direct observations, participant–observations and physical artifacts. (Robert K. Yin, 2009)

Case study guidelines



4.6 Research Design Phase

The entire process of reviewing the technical literature, identification of research problem, establishment of study objectives, definition of research definitions, choice of research methodology to address the study objectives, and development of research design technically are brought together in research design phase. This has been elaborated further in Chapters 1-3 and the current chapter under the topic methodology. A realistic understanding was established in this phase about the usefulness of methodology. It was to recognize the study objectives and target cases. However, the subjects to be interviewed were identified at the commencement and an interview was designed. With the completion of the research design phase arrived the next challenge, the data collection phase.

4.6.1 Research problem

Due to incompetent communication skills and language fluency in government building construction projects in Sri Lanka various problems have arisen.

4.6.2 Selection of the Participants and Sample Size

The data collection is based on distinct categories of the construction team, from Project management party, client, consulting parties, contractor and sub – contracting parties.

The procedures to achieve the aim of the study as follows:

A literature review was carried out to determine the base of the study and reference from trade experience of neighboring countries were obtained.

Based on recent projects, at least five samples of each category and more than five samples from critical categories were deemed to be interviewed.

Data was collected by both telephone-based survey and semi structured interviews, which were compared against the aim of the study.

The culmination result of the study was based according to the procedures mentioned above. The data obtained by the survey helped to identify the need for improvements in communication within the construction team.

The information gathered and formed would be mainly useful to consultants and client. The study also helped to identify the ways to improve communication among the team which is important to the government as well as other construction project works in the country.

4.7 Methods of Data Collection

The required data can be collected in many ways. They differ significantly in the aspects of cost, time and other resources available to the researcher. However, primary data can be collected through both experiment and survey.

(i) **By observation:** It is the method of collecting information through own observation of the investigator, without interviewing the respondents. The information obtained recounts the current happenings which do not consist of past behavior or future intentions or attitudes of respondents. This method can be used when researcher is involved in the process as a member of the team. However, the information provided through this method is also very limited specially it is difficult to fulfill where large samples are concerned. Contributions of only professionals or executive members can be considered.

(ii) **Through personal interview:** A rigid procedure followed by the investigator that pursues answers to a set of pre-conceived questions through personal interviews. It is a method of collecting data in a structured manner. The output of data largely depends upon the ability of the interviewer.

(iii) **Through telephone interviews:** It is to gather information by contacting the respondents by telephone. Though not a widely used method it plays a significant role in industrial surveys in developed regions. This approach proves to be useful when the survey faces time constrains or involves consultants.

(iv) **By mailing of questionnaires:** The researcher and the respondents encounter each other in this method of survey. Questionnaires are mailed to the respondents with a request to return after completing the same within a stipulated time frame. A widely used method in various surveys. Prior to applying this method, a pilot study for testing the questionnaire is usually conducted to reveal any drawbacks. Questionnaire must be prepared cautiously for the information gathered to be effective and relevant and should address all correlated groups involved.

4.8 Selected Data Collecting Method

Personal Interviews - Distributing a Questionnaire, through telephone interviews, by mail, via email and physical handing over to individuals

Selected categories:

Professionals - Principal Architect, Associate architects, Structural Engineers, Service Engineers, Electrical Engineers, Assistant Engineers, Quantity surveys, the Contractor

Other stakeholders -

Client's Party representatives, Draft personnel, Clark of Work at site, Sub Contractors, Suppliers, Accountants of Client's party, selected workers and minor staff/ workers of the construction team

Case study analysis of a selected single case study also help to determine questions and background studies. Using a case study as a method of data collection under sources of evidence such as Documentation, Archival records, Direct observations, Participant–observations and Physical artifacts, help determines to select direct observation and participant observations. It also helps to collect quantitative and qualitative data to the study.

A compiled questionnaire was given to few people from above categories for data collection. Only very few of them returned answered papers and some of them have

answered only structured questions, but not the open-ended questions, due to their poor language skills to read, understand and write down their ideas. Only professionals have answered the complete questionnaire. Clerks, draftspersons and site supervisor level members of the team have answered few questions or not at all.

Questionnaire was prepared based on two different formats. One was for professionals considering the entire procurement process with semi structured and open-ended questions. The other one was for the other stakeholders with semi structured questions focused on construction stage. Samples of 25 from each category were selected for this survey. Appendix A and B shows the questionnaires and Appendix C shows the list of respondents.

4.9 Summary

This chapter discussed the research methods in general and a single case study to support the selected methodology for the present research. Case study was of a recent actual government building construction project carried out for a Government Ministry in Sri Lanka.

In the above chapter the basic types of research, evaluation methods and series of actions or steps that should be taken effectively to carry out the research is discussed. The desired sequencing of the required phases in the research process are also discussed.

Furthermore, the research methodology is discussed in detail in the above chapter. This included the data collection, process and analysis required to carry out the research, referring to the case study. Thereafter a conclusion is arrived at after all the aspects are given due consideration.

CHAPTER 5

DATA COLLECTION AND ANALYSIS

5.0 Introduction

This chapter analyses the qualitative and quantitative data collected from semi-structured questionnaire survey. The forcussed groups are based on the languaage skill problems in Government building construction projects in Sri Lanka. Qualitative and quantitative data are gathered from two main categories, namely professionals and other relavent stakeholders in the industry.

The aim of the research is to identify communication and language skill problems in government building construction projects. Furthermore this is to analyze such problems arising from lack of professional and occupational competence with regards to language skills. Questionnair survey is done throughout the project process according to different stages from inception to completion. Hence the aim was to discover most critical stages affected by communication problems and identify which category of the team members need improvements most.

Quetionnaire survey is conducted from the insights drawn from the case study annalysis. Subsequently Chapter 06 will include suggestions and problem resolution methods.

Observations and recommendations for language skill improvements discussed with professionals and other stake holders are also included in this annalysis. Professionals were interviewed considering entire procurement process. However other stakeholders were intervivewd mainly from construction stage up to completion, depending on their involvements.

This study quesionnaire forcuses mailny on main stages of procurement process. In addition suggessions to improve language skills and discussions with regard to supportive training for employees are also included.

Altogether 25 professionals and 25 other stakeholders relavent to the construction industry have participated in this survey. All relevant data are represented in percentage (%) values.

Data ananlysis is presented in tables, charts and diagrams, in relation to different phases of the project from inception to completion. In conclusion, a summery of the study on this annalysis is also presented.

5.1 Case study annalysis on communication and language skill problems

Case study as a research method and a supportive source of data.

Nature:	Actual project – Government Building Construction Project.
Project:	PROPOSED CONSTRUCTION OF THE ADMINISTRATION BLOCK & SPORTS SHOPS AT SPORTS COMPLEX, COLOMBO, SRI LANKA
Client:	Government Ministry. Colombo.
Client's representative:	The Chairman, Sports Complex Authority.
Consultant:	Chartered Architects
Contractor:	Private contractor
Project Manager:	Government Corporation.

Background of the project:

	Phase 01	**Phase 02**
Building	Two storied building facing the road.	Two storied administrative building facing the stadium, with a lift

	Phase 01	**Phase 02**
Ground floor	04 numbers of sports shops, sanitary facilities, restaurant, kitchen, toilet block for public, car park and landscaped area with walkways.	Lobby, Reception, open office area and landscape of front garden.
Upper floor	Open office area and open terrace dining area.	Board room, Chairman's room, open office area.
Time frame	January 2013 – January 2014	January 2014 – November 2016
Suggested Duration	09 Months	12 Months
Actual Duration	18 Months	24 Months – Not completed to date
Area:	7360.00 Sqft	5960.00 Sqft
Cost:	50.03 million LKR	36.5 million LKR

Problems encountered due to poor language skills according to stages of the project:

Stage A

Inception, Feasibility, Preliminary Sketch Design, Schematic Design and Design Development Drawings

Delays and revisions due to poor language skills

Client's project coordinator could not communicate in English. Thus, Chairman himself had to attend all the meetings. The Chairman had to be present to discuss client's brief, needs and costing aspects. With a busy schedule this was difficult for the Chairman and it took a longer time to finalize briefs and costing of the project. As a result, the Consultant had to impose additional effort and time during this stage.

Decision making and details of the project during design phase suffered from the beginning. Since the Client – Consultant agreement documents were written in English Client's staff was not compatible enough to understand clauses. Thus, Consultant had to delay the process until approval is obtained from the Chairman. Hence, it took more than two months to sign the agreement after the schematic design submission. It was required to reissue the document and translate same to the clerks most of the time. This resulted in leaving the Consultants unsatisfied and disappointed as well.

Stage B

Preparation of Council Permit Drawings, Construction Working Drawings, Electrical Working Drawings & Services Working Drawings, Bill of Quantities

Misinterpretations, delays and extra works due to poor language skills

Design and details were explained with support of 3D images and similar imageries for easy understand. Translation were provided where necessary to assist Client's staff regarding the design. Though most of the communications could have been done via email and telephone it was not possible during this phase of the project. Due to the reason that Client's staff was not compatible to communicate or respond to emails in English, the Consultant and her assistant had to call for meetings to discuss each aspect of the design and to solve design problems. As a result, confirmation to costing sheets and design process got delayed. This also led to additional time and cost involvements due to extra meetings. Less documentary evidence from Client's party at this stage resulted with no email or postal responds.

Stage C

Preparation of Bidding / Contract Documents, Bidding, Negotiations and Award of Contract

Misunderstandings, delays, disputes due to poor language skills

At council drawing submissions, Consultant's party had to furnish all the documents behalf of the client, since the Client's party/ Client's project coordinator was unable to read, understand or write in English. Involvement of the Client's party was less due to incapability of handling formal written documents and forms in English.

At this stage, it was further difficult to communicate in English with the Client's party. To make them understand drawings and documents due to lack of knowledge in technical terms and writing skills in English was a drawback. Consultants were compelled to wait for meetings, to graphically present ideas and translate written documents. Invoices were always delayed proceeding with payments which left the Consultant's party unsatisfied which led to delays in the process. Consultant refused to submit work until payments were received and payments were constantly delayed due to lack of understanding of payment certificates explaining work done. Minutes of meetings were not circulated orderly; hence delays were experienced with action to be taken due to no email response from client. Misunderstanding by the Client's clerk and accountant in agreement document written in English led them make an extra amount of payment to Consultant by mistake. Poor language skills resulted in disputes in this stage as well as delays in the process.

Letters, technical terms, notes and specifications had to be translated to Sinhalese, at meetings. All the letters sent from Clients party was in Sinhalese but some technical terms were interpreted wrong in Sinhalese. However, letters and all other documents from all the Consultant was communicated in English.

Bidding stage also faced the same communication and language problems in getting confirmation in writing from Client. Also, misinterpretations of documents led to re print and reissue which resulted in extra cost and time wastage to Consultant's party.

Stage D

Supervision of Construction Work by Consultants.

Misinterpretations, resubmissions, extra works, delays due to poor language skills

Expected cost, quality and time management not met throughout the project.

Quality: Expected quality on overall construction was not met due to following problems.

Misinterpretations of site inspection log entries.

Wrong fittings and appliances were supplied due to suppliers and subcontracting parties misunderstanding the Bill of Quantities.

Contractor was reluctant to work with the Client due to miscommunication such as unclear instructions, delays in work confirmations by project management parties and delay in payment confirmations.

Change of Contractor in the middle of the construction work.

Consultant had to resubmit all the relevant bidding documents and reorganize tender process. This resulted in resubmission of all documents which caused delay, cost escalation and extra cost for preparation of drawings and tender procedure.

Due to poor writing skills of Client's party and communication problems of project coordinator, when the contract was awarded to a new contractor; further delays occurred owing to issues regarding relevant documents and mobilization advance.

Second contractor's work quality was not up to the required standard. Most of the finishes had to be redone. Problems related to time, cost and quality affected the project flow. Then it was decided to award the project construction to a third contractor.

Project was retendered and once again was awarded to the first contractor. However, then he refused to carry out work for the previous rates. Thus, Bill of Quantities and payments were revised accordingly and project work restarted.

As a result of linguistic problems, the project work suffered.

With the Client wanting to expedite the process with this Contractor most of the quality aspects were ignored. Design aspects and architectural values of the original design was compromised. Quality of workmanship and standards were ignored to expedite work where instructions of the Consultant's party were yet again misinterpreted.

The technical terms in the letters issued by the Client which were written in Sinhala were mostly misinterpreted. Therefore, reissuing of documents was required which was a problem that took a long time to sort. Consultant had to translate meeting minutes, letters and notes issued, to the Client. Since the meetings were held in English, Clients party coordinators and clerks have taken notes and instructions inaccurate. This issue elaborates under section 3.7, effective communication, about the importance of manage meetings professionally and under section 2.9.1.construction progress meetings.

Cost: Due to delays, cost escalations and material wastage when stacked outside for prolong periods at site was experienced. Consultant had to re-issue documents many times over to record and understand in English since the Client's party coordinators could not comprehend drawings, documents and letters written in English.

Time:

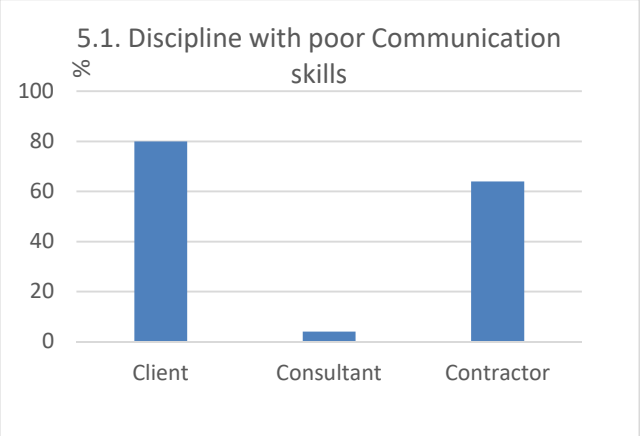
Delays were experienced due to late responses via email and letters by the Client and delays in preparing documents by Contractor due to language problems of the staff.

Payments for Consultant were overdue owing to delayed payment procedures which are related to language problems. Thus, delay in drawing submissions led to further delays in construction work.

5.2 Analysis of semi-structured interviews with the focused groups on language skill and communication problems.

5.2.1 Semi-structured interviews with Professionals (QP)

5.2.1.1. Problem arising in construction Industry due to miscommunication.



	Disciplines
1	Client
2	Consultant
3	Contractor

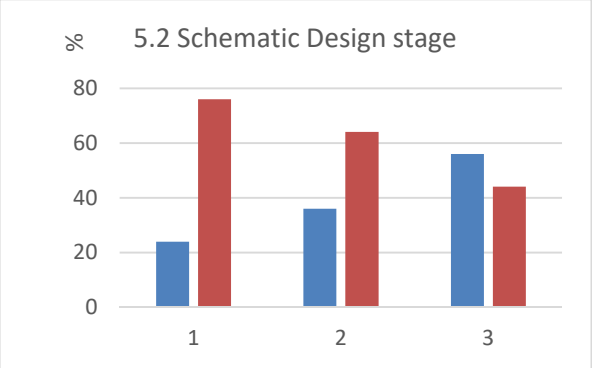
Figure 5.1. Discipline with poor Language skills

Figure 5.1. Shows the principal motive to initiate this study. According to most of the responses which is 80% of professionals indicated that the Client's party has poor language skills compared to other team members. Contractor's party was the second critical discipline with 64% of poor language skill. However, Consultant's party indicated only a remarkable 4%, a relatively low language skill problem based on the survey.

Ideas of the professionals on resolution of the above problem regarding different perspectives been identified and elaborated below. Few respondents think more detailed estimates and examples from similar projects could clarify the issues of Clients with language problems. Most of the respondents have concluded translation is the answer for language misinterpretations. This discussed in case study Stage A and International examples refer in Construction project culture under 3.8. This was considered more viable since initial stages of a project must be finalized properly to achieve a successful progression of a project. It is proposed that when a responsible person from the Client's party is unable to convey his ideas to the Consultants at this

briefing stage, Client's representative staff to be involved throughout the project for communication and coordination. Most of the professional respondents think it is better to have regular meetings with the Client's party with 2D drawings, 3D images, diagrams, sketches, costing sheets and visual presentations with illustrations to help reduce miscommunications. However, it is agreed that discussions and written documents at this initial stage could be in preferred language but standard documents like agreements, Bill of Quantities and confirmation letters should be in English language.

5.2.1.2. Miscommunication and revisions due to poor language skills



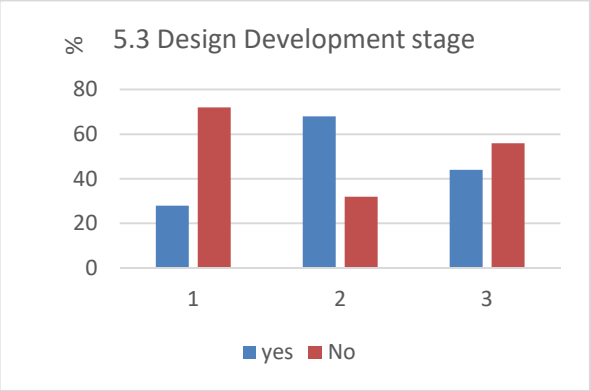
	Miscommunication type
1	Miscommunication with regards to the Client's brief
2	Difficulty in finalizing design brief
3	Revisions due to language misunderstanding

Figure 5.2 Misinterpretations, delays and revisions due to poor language skill

Figure 5.2. elaborates the key areas where misinterpretations, delays and revisions occurred in Schematic Design phase due to poor language skills. According to this data analysis, 24% of respondents think that the Client's briefing skills are poor and delays and miscommunication occurs in the Client's brief. About 36% of professionals found difficulty in finalizing design brief with the Client due to poor language skills of the Client's party. This discussed in case study Stage A and B.

56% of majority have experienced revisions and rework due to misunderstanding the language in Schematic Design stage where mostly professional designers and consultants directly deal with Client's representatives at the project introduction phase.

5.2.1.3. Misinterpretations, delays and revisions due to poor language skill at design development stage



	Miscommunication type
1	Misinterpretation of ideas with the client
2	Delay in finalizing the design due to poor language skill
3	Revisions/rework due to poor language skill

Figure 5.3 Misinterpretations, delays and revisions due to poor language skill

Figure 5.3. Illustrates misinterpretation, delays and revisions due to Client's poor language skills. 28% of participants have experienced misinterpretation of ideas with the Client. 68% of participant professionals experienced delay in finalizing the design due to poor language skill of Client's party. 44% of participants have observed revisions and rework due to poor language skills where primarily the key consultant professionals directly deal with the Client at Design Development stage focusing on the design aspects.

Respondents have suggested different measures to overcome above problems. Most significant remedy is to explain design ideas with the help of 2D or 3D manuals and digital sketches, drawings, power point and other multimedia presentations at meetings. This discussed in case study Stage B and under 3.7 effective communication.

It was suggested to translate ideas in a preferred language rather than use of English in meetings and design explanations. Assistant architects and assistants of other consultants can further explain design ideas in lucidity to the Client's party incorporating multimedia, printed materials, mood boards and costing. Design confirmations can be made through telephone conversations until written confirmations are given, to expedite the work process since most of the confirmations

get delayed due to poor English writing skills of the staff. Confirmation letters are suggested to be issued later for document purpose while work proceed based on verbal confirmation.

5.2.1.4. Poor language skill delayed obtaining council approval

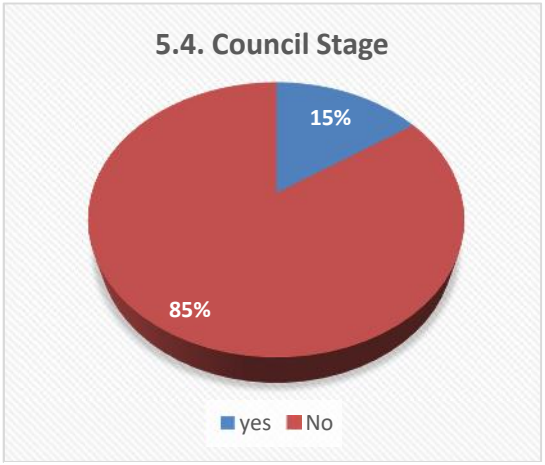


Figure 5.4 Revisions due to communication misinterpretations in documentations

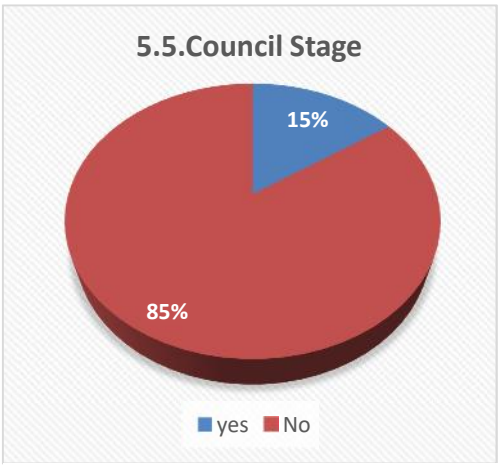


Figure 5.5Poor language skill delayed obtaining council approval

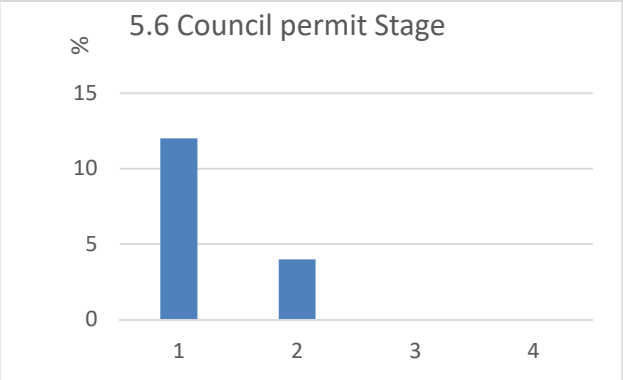
After design finalization, it is formal to work towards Council approval for the proposal from local authorities even though for a government project. Architects, Project managers, Engineers of relevant disciplines and the Client gather in this stage to compose documents to present to local authorities. It is a formal procedure where everyone should follow standard set of regulations and documentation to gain council approval. Mostly Architect and the Client participate in this stage and participation of other consultants are limited.

This discuss under section 3.2.1.d Project administration issues and case study under stage C.

Figure 5.4 shows 15% of participants have observed revision / resubmissions due to communication misinterpretation in filling forms and documentation. However, a majority has not experienced any problems in this stage due to language problems.

Figure 5.5 reveals that only 15% of participants have identified poor language skills of council staff and Client has resulted delays in obtaining council approval.

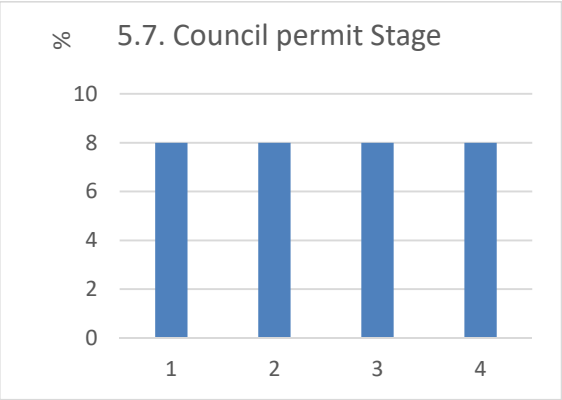
5.2.1.4 Parties acted to result above problems.



	Person/Party
1	Technical officer
2	At the committee
3	Revenue officer
4	The commissioner

Figure 5.6: Parties responsible to occur problems such as misinterpretations, delays and revisions due to poor language skill

Figure QP. 5.6 shows results of parties responsible in creating problems such as misinterpretations, delays and revisions due to poor language skills of professionals in the team. 12% of respondents think Technical officers' work in local authorities are responsible for most of the delays in the process. 4% thinks it is due to the members of assessing committee. No one has identified the revenue officer or the commissioner as the cause for delays due to communication problems.



	Problem Encountered
1	Miscommunication in the drawing/document
2	Could not understand engineer's recommendations
3	Difficulty in reading filled forms in English
4	Given unclear instructions when communicated in English which lead re-submission

Figure 5.7: Problems encountered due to poor language skill

The above figure 5.7 illustrates number of problems encountered due to poor language skills in the design team, Client and council at the local authority approval stage. 8% of respondents think that the problems encountered are due to miscommunication in the drawings / documents. Another 8% of participants identified problems of not clearly understanding recommendations of Engineers in the local authority due to poor language skills. Further 8% of participants think difficulty in reading furnished forms in English, resulted in creating problems in this stage. Finally, 8% of respondents also think unclear instructions to parties where communicated in English, leads to resubmission where problems are encountered in this stage.

Very less number of respondents have given their opinion on problems in council permit stage. Suggestions over measures to rectify problems encountered in council permit stage are also minimal.

Respondents suggested to revise and resubmit drawings and documents under the supervision of senior consultants where necessary. Objective 04, solutions emperies about this issue. Mostly it was suggested that all documents, forms and drawings should adhere to local council regulations and submission standards, hence less number of revisions or resubmissions may occur in the process. Respondents think it is effective to make conversations and discussions in a preferred language while submission requirements and documents could be done in English.

Objective 02 is referring regarding this issue where professionals such as revenue officers and commissioners should have good command in language skill and professional competence.

5.2.1.5. Problems encountered with incomplete, inaccurate or improper drawings at working drawing stage

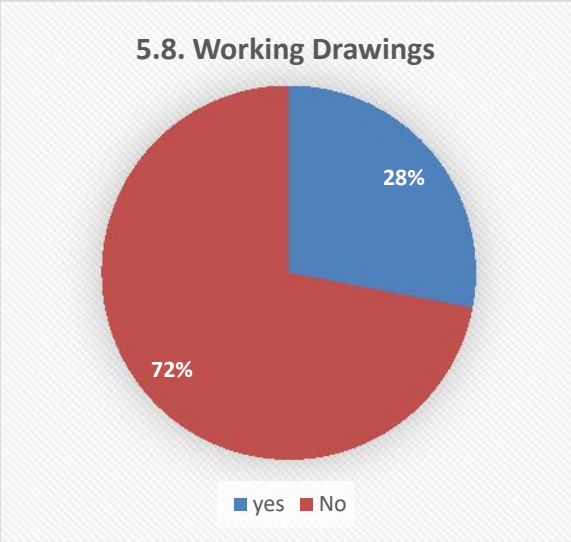
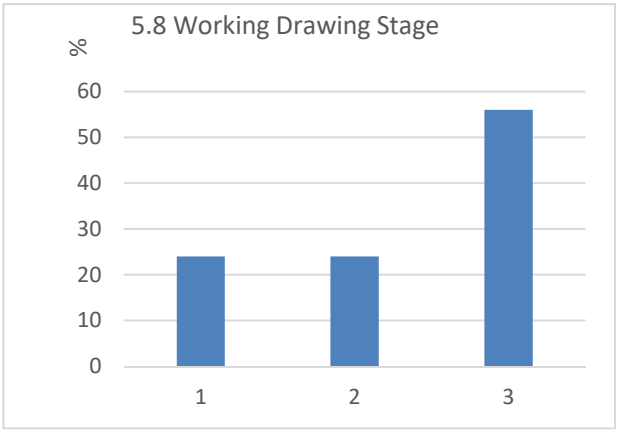


Figure 5.8: Encounter any drawings with incomplete, inaccurate or improperly correlated notes

Figure 5.8. illustrates about problems encounter due to drawings with incomplete, inaccurate or improperly correlated notes from Consultants. Only 28% of respondents uncounted drawings with incomplete, inaccurate or improperly correlated notes from consultants. 72% of respondents think drawings and notes issued from consultants at Working Drawing stage have not created any problem due to poor language skills.



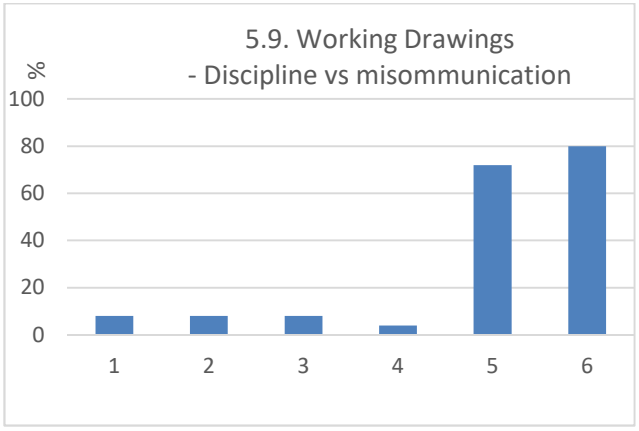
	Problem Encountered
1	Detailed were not clearly defined in English
2	Miscommunication in schedules and notes due to wronged language usage
3	Drafting errors due to lack of understanding over consultant's instructions

Figure 5.8.1: Encountered problems due to poor language skill

Figure 5.8.1 shows problems encountered due to poor language skills during working drawing stage when compiling drawings and notes. 24% of participants think that problems were encountered since details were not clearly defined in English. 24% of participants identified miscommunication in schedules and notes that was encountered due to erroneous usage of language. Majority of participants, which is 56% think drafting errors due to lack of understanding of Consultant's instructions contributed to most of the problems at working drawing stage.

This discuss under case study stage C, under section 3.26 effects of construction project management and 32.7.Project manager's role.

Respondents have given the following suggestions to rectify the above-mentioned problems. Use of preferred language while giving instructions directly from Consultants or assistants is recommended. It could solve the problems related to unclear definitions in English and written data with erroneous usage of language. Translating instructions to drafting personnel and use of sketches or any other helping tool can be used to convey design ideas to support error free working drawings. Instructions should be simplified when instructing drafting personnel. Regular drawing reviewing session and meetings can also be conducted to ensure erroneous free work.

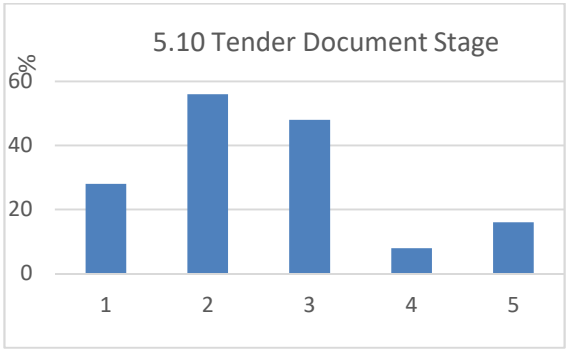


	Discipline
1	Architectural
2	Structural Engineering
3	Electrical Engineering
4	Services Engineering
5	Contractor's party
6	Client

Figure 5.9 The discipline done miscommunications most

Figure 5.9. describes the disciplines that repeatedly miscommunicated most at this stage. Architects, Structural Engineers and Electrical engineers show less number of miscommunications as 8% at working drawing stage. With most of the technical involvements presented at this stage, Building Services Engineers are identified as the lowest with miscommunications in working drawings at 4%. Contractor's party is encountered with 72% miscommunication rate where Client's party has 80% of miscommunication at this stage of technical contributions.

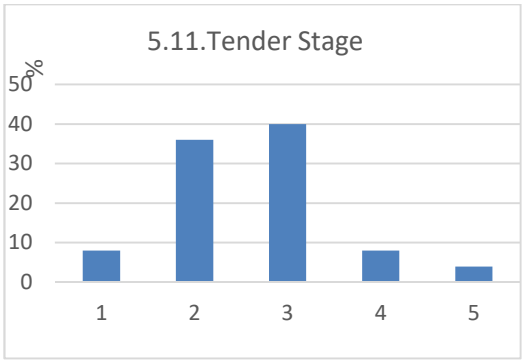
5.2.1.6. Problem Encountered due to poorly written Documents at tender document Stage



	Problem Encountered at
1	Reports
2	Letters
3	Specification
4	BoQ
5	Schedules

Figure 5.10. Problem Encountered due to poorly written Documents

Figure 5.10. illustrates problem encountered due to poorly written documents at the preparation of Tender Documents stage. Respondents encountered 28% of problems due to poorly written reports and another 56% of respondents identified poorly written letters as the cause of problems. 48% of respondents think problems encountered are due to poorly written specifications and 8% of respondents have found Bill of Quantities as the cause for problems at this stage. 16% of respondents think that poorly written schedules in tender documents created problems. This discuss under case study stage C, translations to support written documents.

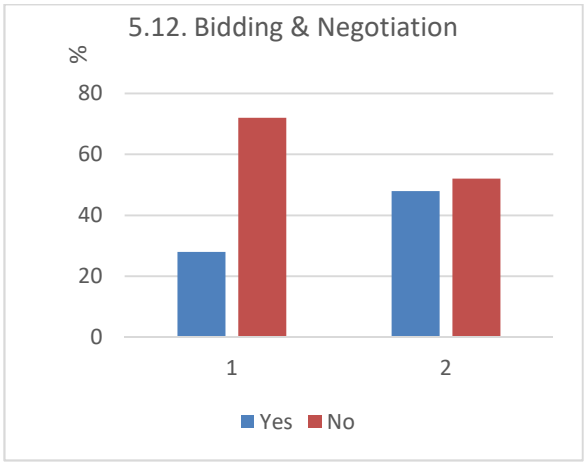


	Level of Impact
1	Insignificant
2	Minor
3	Moderate
4	Considerable
5	Severe

Figure 5.11. Level of Impact due to problems to overall success of the project.

Figure 5.11 shows the level of impact on project work due to problems related to language skills in written documents in Tender stage. 8% of participants think such impact is insignificant. 36% of participants identified the level of impact at a minor level. About 40% of respondents think an impact of moderate level is on the tender process. 8% of respondents identified it as a considerable amount of impact to the work whereas 4% of minority thinks severe impact befalls due to poor language skills in tender procedure documentation.

5.2.1.7. Negative Impact on project work due to poor language skill at Bidding and Negotiations Stage



	Negative impact
1	Negative impact due to poor language skill on project with regards to Bidding
2	Negative impact due to poor language skill on project due to Client/Consultant/Contractor

Figure 5.12 Negative Impact on project work due to poor language skill.

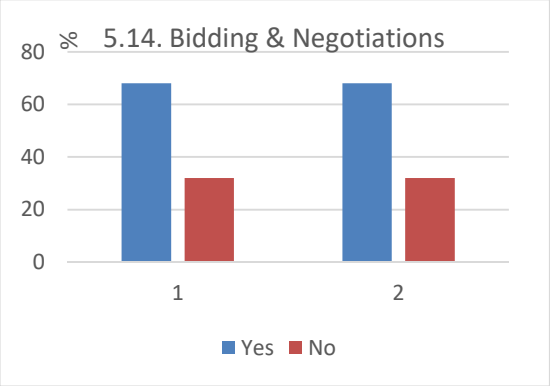
The above figure 5.12 shows the significance in negative impacts due to poor language skills on project work with regards to bidding at Bidding and Negotiation stage. 28% of participants have agreed that project work experienced negative impact during bidding stage and 72% of majority has answered as they have not experienced any negative results at bidding stage due to poor language usage.

The same figure 5.12 describes the negative impact at the bidding stage occurring due to poor language skill of different disciplines. 48% of participants declares there is a negative impact on bidding process due to language skill problems of disciplines in the categories of Client, Contractor or Consultant. Balance 52% didn't identify any problem due to poor language skills at the bidding stage.

	Level of Impact
1	Insignificant
2	Minor
3	Moderate
4	Considerable
5	Severe

Figure 5.13 Level of Impact to overall success of the project due to problems.

Figure 5.13 illustrates level of impact on project work at Bidding and Negotiation stage due to poor language skills. 16% of respondents thinks there is a significant impact while 28% of participants identified it as a minor impact on bidding process. Similarly, 28% of participants think impact is at moderate level. Only 4% of respondents think there is a considerable amount of impact at this stage. Nevertheless no one has identified that poor language skills cause severe impact on project work at this stage hence most of the time professionals and administrative level team members who has good language skill participates in this stage work.

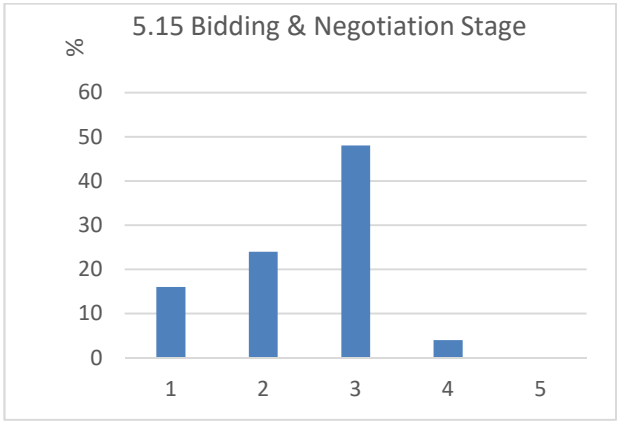


	Negative impact
1	Negative impact due to poor language skill on project with regards to Bidding
2	Negative impact due to poor language skill on project due to Client/Consultant/Contractor

Figure 5.14 Negative Impact on Negotiations and Disciplines

Figure 5.14 illustrates the significance of negative impacts due to poor language skills on project work regarding negotiation at Bidding and Negotiation stage. 68% of participants have agreed that project work experienced negative impact during bidding stage. Also 32% has responded that they have not experienced any negative results at bidding stage due to poor language skills.

The same figure 5.14 further describes the negative impact on Negotiation stage due to poor language skills of different disciplines. 68% of participants state that there is a negative impact on negotiation stage due to problems related to language skills of disciplines, namely the Client, Contractor or Consultant. The balance 32% think that there was no such problem due to poor language skills at this stage.

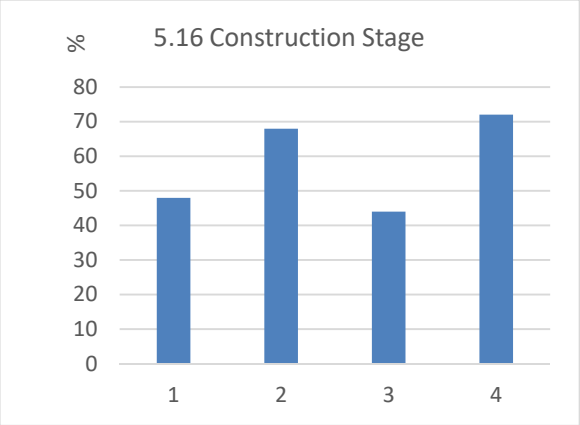


	Level of Impact
1	Insignificant
2	Minor
3	Moderate
4	Considerable
5	Severe

Figure 5.15 Level of Impact due to problems to overall success of the project.

The above figure 5.15 illustrates levels of impact to the project work at Negotiation stage due to poor language skills. 16% of respondents thinks it has a significant impact on project work while 24% of participants identified it as a minor impact on bidding process. 48% of participants identified the impact is at moderate level while only 4% of respondents think impact can be of considerable amount at this stage. But no one has identified that the poor language skills cause severe impact over project work at Negotiation stage.

5.2.1.8. Project work suffered due to Misconceived message types at Construction Stage / Contract Administration



	Message types
1	Telephone
2	Letters
3	Log entries
4	Email

Figure 5.16 Project work suffered due to Misconceived message types

The above figure 5.16 illustrates mediums used for communication in a project and how project work suffered due to misconceived messages. The types of mediums used for communication differ during construction stage since many parties participate in a project during this period. According to the survey, 48S% of participants think miscommunication via telephone conversations occurs due to lack of understanding and inability to speak fluently. 68% of participants thinks poorly written letters created glitches during construction stage. 44% of respondents have experienced poorly written log notes or problems in reading that created misconceived messages.

Majority of 72% critically thinks misconceived email messages have a great proportion of responsibility towards creating problems.

Almost all the respondents have similar views on negative impact that the above problems had on the successful completion of the project. Respondent professionals also have identified less written documents involved in project work due to lack of written English skills. This leads to less written evidence which leads to disputes when the project requires further works. Delay in responding to emails, letters and confirmations have created unnecessary delays which results in financial losses, material wastage and wastage of human resource at sites during construction. This issue was been discussed and elaborated in case study in this chapter.

Construction stage is the phase where many different parties contribute to a project. However, the communication links must work properly together for construction work to progress smoothly. Mostly consultants and assistants convey comments during site visit through instructions written in English on log notes. They also circular emails. When site staff and supervisors find difficulty in reading and understand such instructions implementation of same results in delay or rework. Most of the instructions conveyed by telephone conversations to the site staff or client's staff leads to miscommunications due to lack of language skills. They too cause delays, resubmissions or rework. Usually consultant's verbal and written instructions are conveyed in English. Thus, site staff unfamiliar with English language are incompetent in following such instructions. Such problems arise due to lack of language skill of the team which imposes a negative impact on the project flow.

5.2.1.9. Language Skill Training for professionals

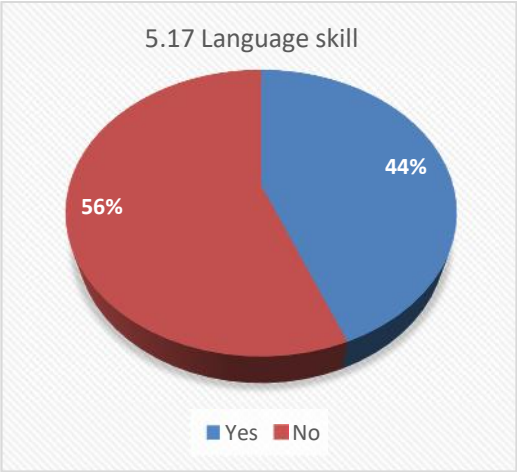


Figure 5.17 Participation of any Language skill training programs.

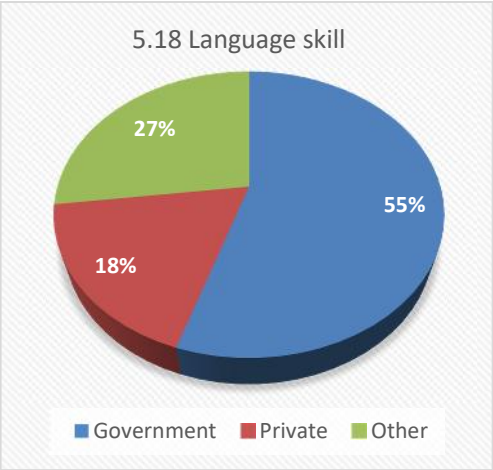
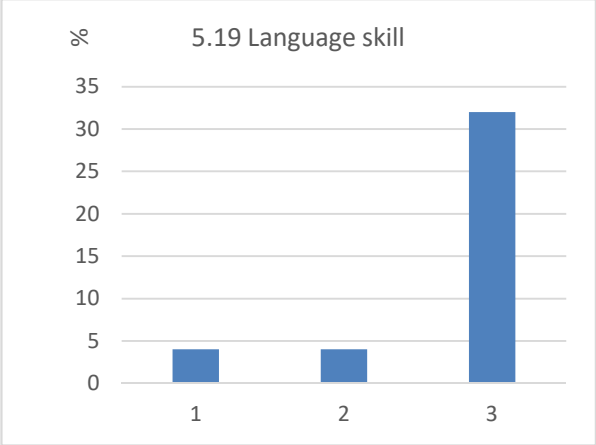


Figure 5.18 Parties conduct Language skill training programs.

Figure 5.17 illustrates participation of professionals in language skill training programs. According to the survey 44% of respondents have participated in language skill training programs but a majority of 56% have not participated.

Figure 5.18 displays the parties who conducted such training programs for professionals in the industry. There are three categories namely Government sector, Private employers and other language training courses. Out of 44% of participants who have partaken in language training programs, 55% have participated Government training programs and 18% participated training courses conducted by private employers. The balance has participated in other language training courses based on their personal judgment.

This is essential as discussed in objective 02, to gain technical and professional competencies and communication skills.



	Frequency of participation
1	Monthly
2	Quarterly
3	Other

Figure 5.19 Frequency of Training programs

Figure 5.19 shows frequency of Training programs conducted by Government and Private Employers. Participants of such programs have taken part monthly and quarterly basis as well as other course durations. 4% of respondents have participated on monthly basis and 4% on quarterly basis while rest of the participants of 32% have other preferred course durations.

5.2.1.10. Ensuring good Language skills of Staff / workmen in projects

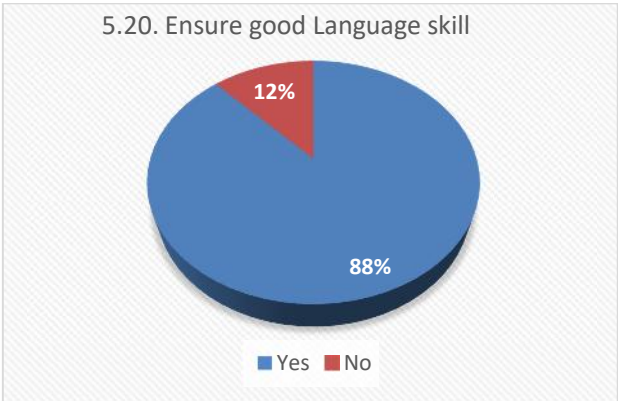
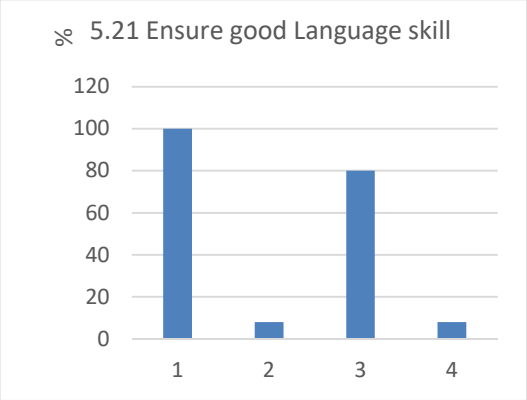


Figure 5.20 Ensure good Language skills

Figure 5.20 illustrates employer's preference of recruiting staff with good language skills to ensure better work environment. A significant 88% of respondent professionals preferred their employees to possess good language skills but the balance 12% do not have such specifications.



	Level of Employee
1	Assistant
2	Minor staff
3	Clerks
4	Worker

Figure 5.21 Project work Level of employee to have good language skill

Figure 5.21 indicates the preference of employers of having staff with good English language skills. An entire 100% of significant preference is recorded for staff graded at Assistant level. 80% of preference for Clerks are also to have good English language skills hence they are the team players who needs to communicate most in different mediums including letter and email writing. Meanwhile 8% of professional participants preferred minor staff and workers to have English language skill.

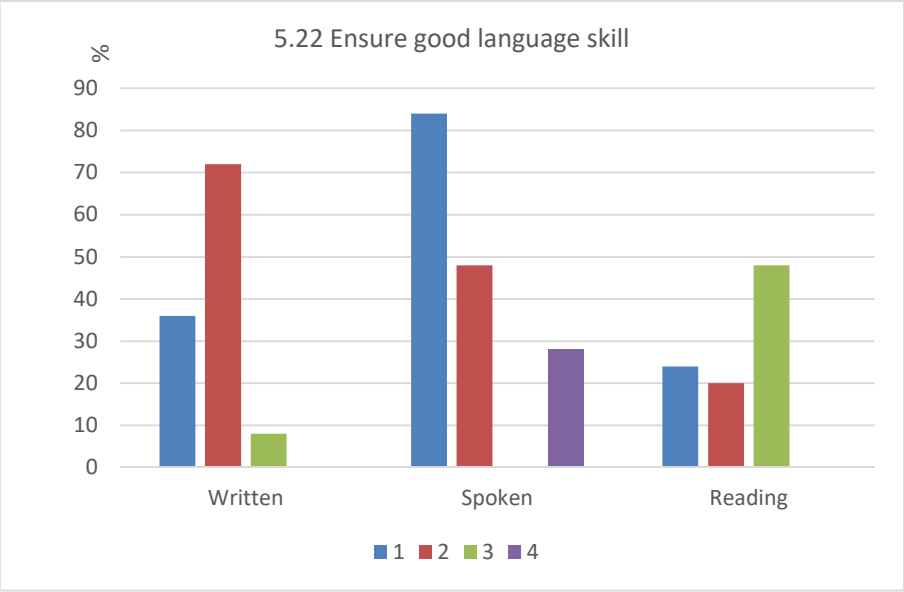


Figure 5.22 Language skill test for Employees

Test	How to determine language skill of an employee
1 Written	1. Ask to fill a form
	2. Short written test of a relevant topic
	3. None
2 Spoken	1. Questions at the interview
	2. Give a relevant topic for a short speech
	3. None
	4. Inquire from previous employers
3 Reading	1. Reading test relevant to the field
	2. Give a short paragraph to read
	3. None

Figure 5.22 illustrates preference of employers to determine language skills of a new candidate. Preference of language skill test for new employees are categorized according to the table above. It basically focuses on Assistant level and Clark level employees as resulted from Figure 5.21.

Considering written tests, 36% of respondent professional employers prefer a new candidate to be asked to furnish a form. 72% of majority preferred a brief written test on a relevant topic to be given as a test. Only 8% think a written test is irrelevant to check the language skills of their new recruits.

According to the results of testing spoken skills of a candidates, 84% of majority confirmed it is necessary to ask questions at the interview in English to check their language skills. 48% think a relevant topic given for a brief speech would be a better option. 28% of employers think it is necessary to inquire about the candidate from previous employers regarding their language skills. However, none seems to think spoken test is irrelevant.

Professional employers prefer to test their new employees on reading as it is important in documentation in project work. 24% of respondents think reading test relevant to the field is a suitable method to test new candidates; while 20% think it is necessary to give a short paragraph to read to test reading ability. But 48% of majority of employers consider it is irrelevant to test reading skills at an interview.

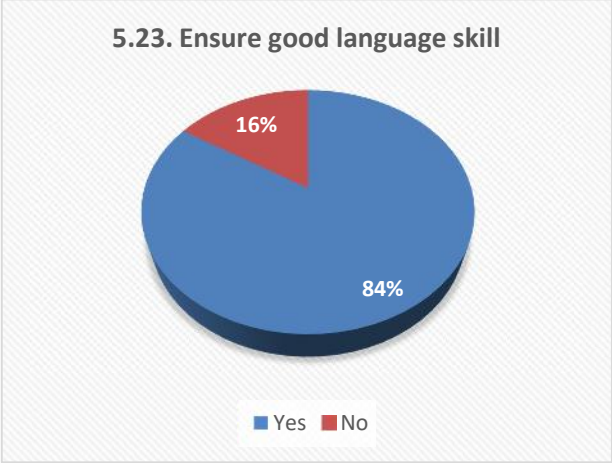
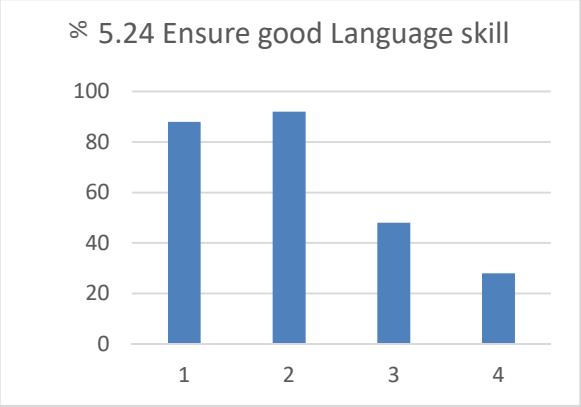


Figure 5.23. Preference for Language skill test on employment

Figure 5.23. elaborates the ideas of professional respondents to ensure good language skills of staff / workmen towards a good working environment.

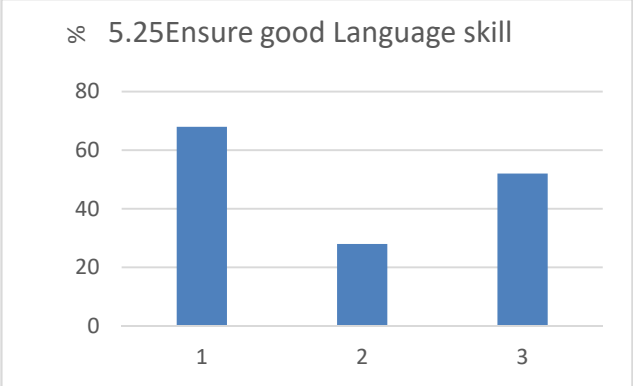
According to figure 5.23. majority of 84% professionals prefer language skill tests to be carried out for new recruits while only 16% of respondents thinks it is unnecessary.



	Test type
1	Speaking
2	Writing
3	Reading
4	Listening

Figure 5.24 Preference of testing on employees

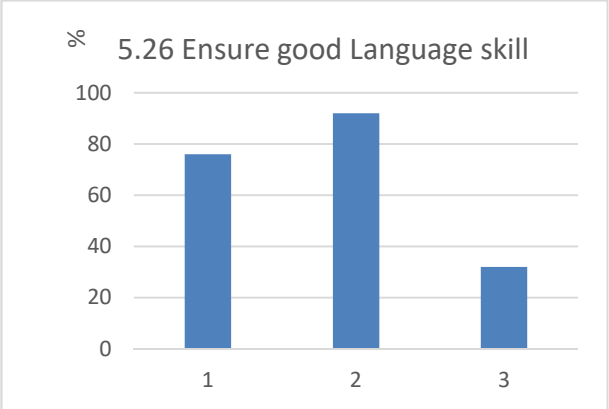
Based on figure 5.24, 84% of above respondents preferred language skill test to be carried out at interviews, 88% of them think it is important to test them on speaking while a significant 92% of respondents thinks it is a must to carry out written test at the interviews. 48% of respondents consider reading test should be carried out. Minority of only 28% think listening test also should be carried out considering the importance of instructions given through different communication media such as telephone.



	Sector
1	Client
2	Consultant
3	Contractor

Figure 5.25 The sector needs improvements

Figure 5.25 illustrates different sectors/ disciplines that mostly needs to be improved in language skills. 68% of majority of respondents think Client's party needs to be improved most as Government sector professionals and staff require to communicate effectively during construction of their projects. 16% of respondents think Consultant's party/ staff need language skill improvements while 52% of them thinks Contractor's party need improvements the most, similar to the facts discussed in the case study.



	Suggestion
1	Expose to work under expertise
2	Language training regularly
3	Industrial communication online tutorials

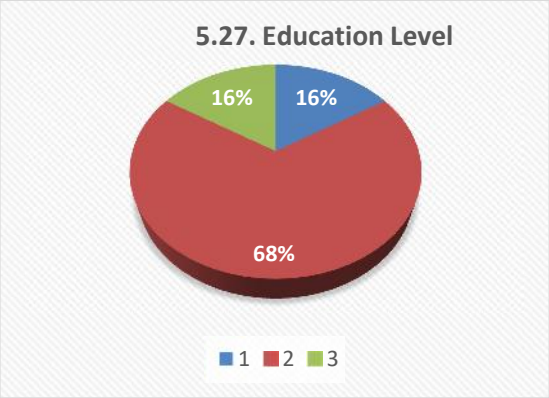
Figure 5.26 Suggestions for improvements

Figure 5.26 shows suggestions to improve language skills of people of different sectors in the construction industry. 76% professionals have suggested that the relevant staff members can be exposed to work under an experienced senior staff

member for a stipulated period of time to improve their language skills as discuss in objective 02, emphasizing the importance of professional and technical competencies. The majority 92% professionals think it is more efficient to conduct language training courses on regular basis until they reach a satisfactory level of communication. Only 32% of respondents think it is good for staff members to refer online / recorded industrial communication tutorials and get feedback regarding exercises until they achieve a satisfactory level of communication.

5.2.2 Semi-structured interviews with Stakeholders on language skills and communication problems

5.2.2 Education level of the sample

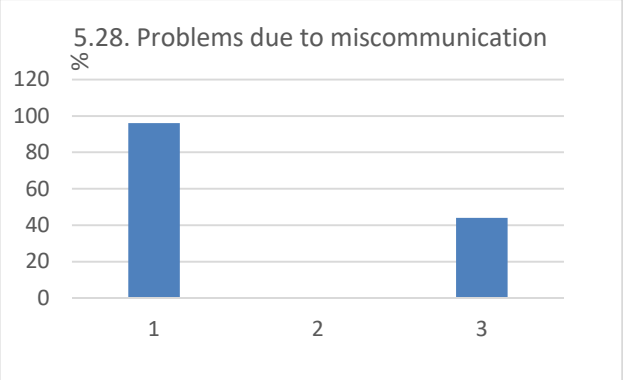


	Education level
1	Basic
2	Secondary
3	Tertiary

Figure 5.27. Education level

Figure 5.27. illustrates level of education of participant stakeholders from different dicsiplines. Out of all the participants 16% have only basic education level and another 16% have reached tertiary education level in their respective field of study. But 68% of majority has completed their secondary education. It is evident that out of respondent stakeholders only a nominal number of participants have received their tertiary education. This lack of education in academic experience depicts a negative impact on their work in construction field.

5.2.2.1 Problems arising in Construction industry due to miscommunication



	Disciplines
1	Client
2	Consultant
3	Contractor

Figure 5.28 Discipline with poor Language skills

The data in Figure 5.28. Identifies the disciplines with poor language skills. According to most of the responses which is 96% of stakeholders it is indicated that the Client's party has poor language skills than others in the team. Contractor's party is the second critical discipline with 44% of poor language skills whereas Consultant's party has not been identified with language skill problems.

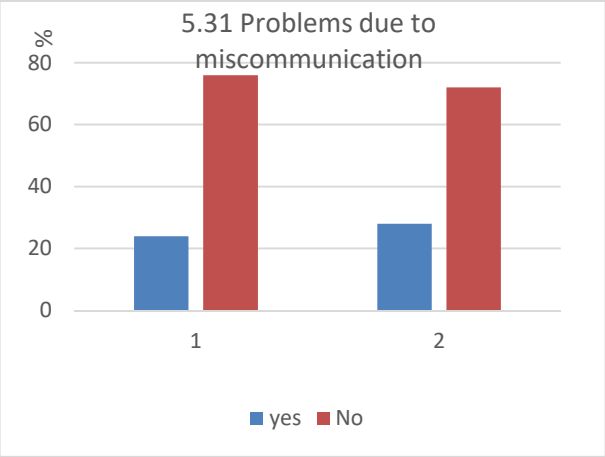
Figure 5.29 Difficulty due to inadequate language skill - Understanding

Figure 5.30 Difficulty due to inadequate language skill - Communicating

Figure 5.29 and Figure 5.30 shows difficulties stakeholders face due to inadequate language skills during a building construction project.

According to Figure 5.29; 48% of respondents found problems in understanding but balance 52% did not have such problems.

In Figure 5.30. 48% of respondents have faced communication problems due to lack of English language knowledge while 52% of majority did not have communication problems.



	Disciplines
1	Drawings
2	Specifications

Figure 5.31. Preparation of drawings and specifications

Above Figure 5.31. elaborates problems in the stage of preparation of drawings and specifications where mostly consultants, project assistants, draft persons and the Client work closely towards in achieving a building design. Drafting persons work on drawings based on consultant's instructions, according to the client's requirements during initial stages until construction stage. In this stage 24% of respondents think miscommunication in drawings have created problems while 28% of respondents identified problems in specifications while detailing the design.

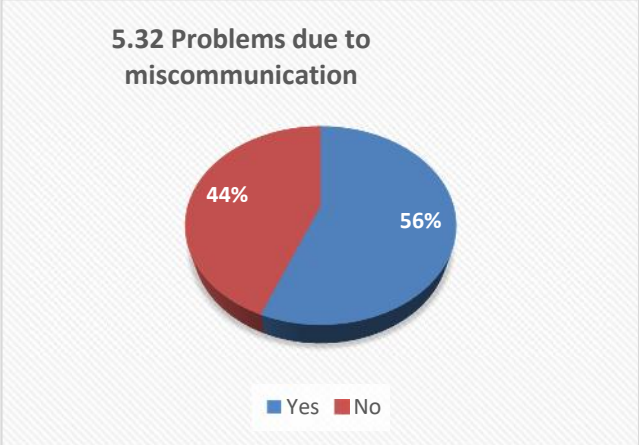
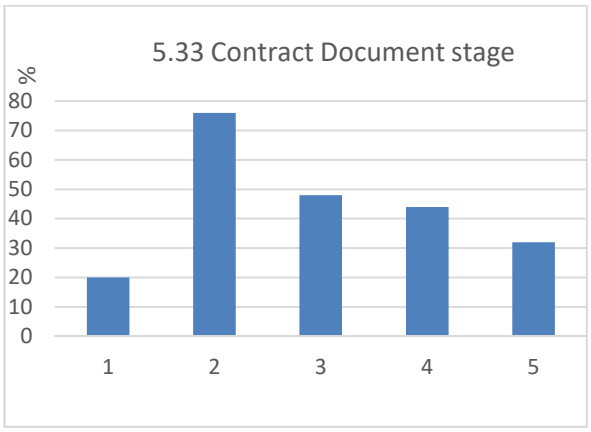


Figure 5.32 Encounter inaccurate, incomplete drawings

Figure 5.32 illustrates the experience the respondents had regarding incomplete , inacurate or improperly correlated notes in drawings. 56% of respondents have identified such incomplete , inacurate or improperly correlated notes on drawings prepared by consultant's drafting staff.

5.2.2.2 Problem Encountered due to poorly written Contract Documents

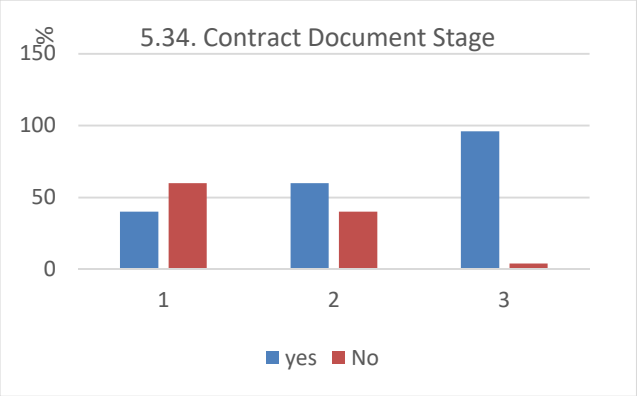


	Problem Encountered at
1	Reports
2	Letters
3	Specification
4	BoQ
5	Schedules

Figure 5.33. Problem Encountered due to poorly written Documents

The above Figure 5.33. illustrates the problems encountered due to poor writing skills during contract documentation stage. Most of the written documents handled during this stage by almost all the relevant stakeholders are contributed by the professional consultants of the relevant project. Based on the finalized design reports, specifications, Bill of Quantities, schedules and letters such as agreements, awards, warranties…etc. are prepared and circulated at this stage.

The survey shows a notable increment in issues due to poor language skill in written communication in this transitional stage where all the paper work is handed over to actual construction stage. 20% respondents have received problematic reports which required resubmissions. A significant 76% respondents said that there were errors in letters included in the contract documentation. 48% of respondents stated there were poorly written specifications that led to resubmission of drawings and revisions to Bill of Quantities. Furthermore 44% respondents identified that there were errors in Bill of Quantities. 32% recognized problems in schedules where Bill of Quantities needed to be revised which resulted in delays in the process. Poorly written documents can arise issues and disputes in construction and delay in payments in latter part of the project.

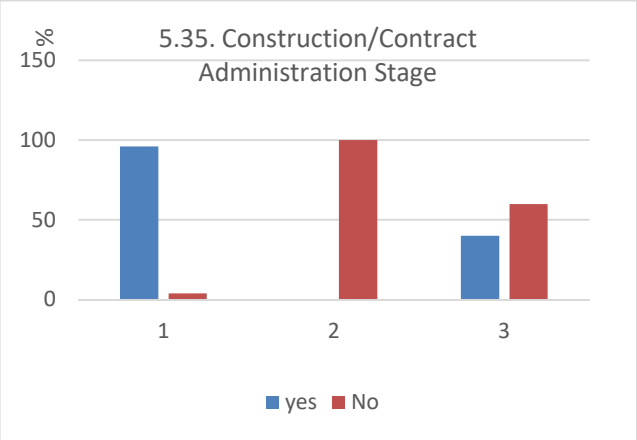


	Problem Encountered at
1	Errors in the tender document
2	Flaws in the specifications
3	Were rectified documents re-issued

Figure 5.34. Problem Encountered due to poorly written Documents

Above Figure 5.34. describes issues in documents with errors that effects the documentation stage. 40% of respondents confirms there were errors in the tender documents while balance 60%, the majority has not identified any shortcomings. 60% of respondents thinks there were flaws in specifications while only 40% have not identified any errors in specifications. A significant 96% of response level shows the magnitude of revised documents reissued due to poor language usage in documentation. 4% of insignificant number of respondents only have not experienced problems due to document rectification and resubmissions.

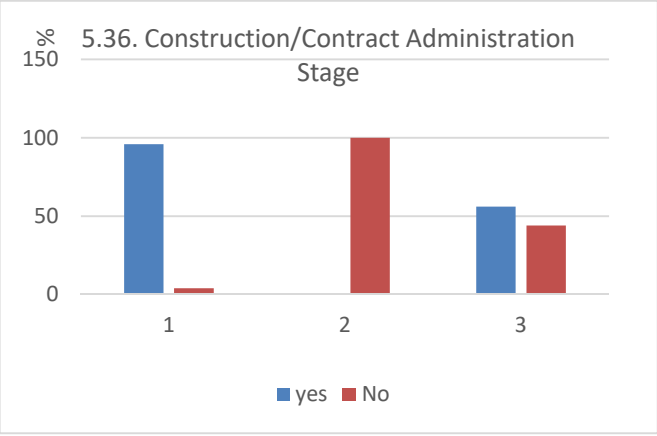
5.2.2.3 Discipline with poor Language skills result negative impact on project work at Construction Stage / Contract Administration



	Disciplines
1	Client
2	Consultant
3	Contractor

Figure 5.35. Discipline with poor Language skills result negative impact on project work

Figure 5.35. explains findings on disciplines in construction field with poor language skills that imposes a negative impact on project work. 96% says Client and staff of government organizations have significant indication of poor language skill at work. 40% indicates that contracting party staff also displays considerable amount of problems due to poor language skill. None of the respondents identified any problems arising due to poor language usage of Consultant's parties.



	Disciplines
1	Client
2	Consultant
3	Contractor

Figure 5.36 Discipline made misinterpretations most

Figure 5.36 is extending the idea referred in Figure 5.35 by examining the misinterpretations created by relevant parties during construction stage. Majority of 96%, of respondents say it is caused by Client's party. 56% indicates that it is due to Contractor's party. None of the respondents experienced problems due to miscommunications caused by the Consultant's party.

Client- the Government organizations, mostly carry out work in local language, Sinhala. Hence staff is more efficient and comfortable in working with Sinhala than English. Whereas all the construction documents are written and issued in English, including the communications that are carried out through digital medias.

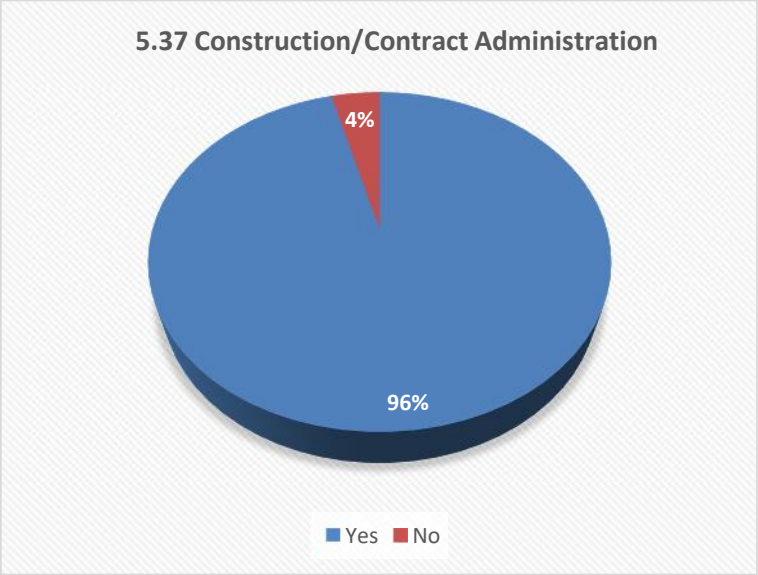
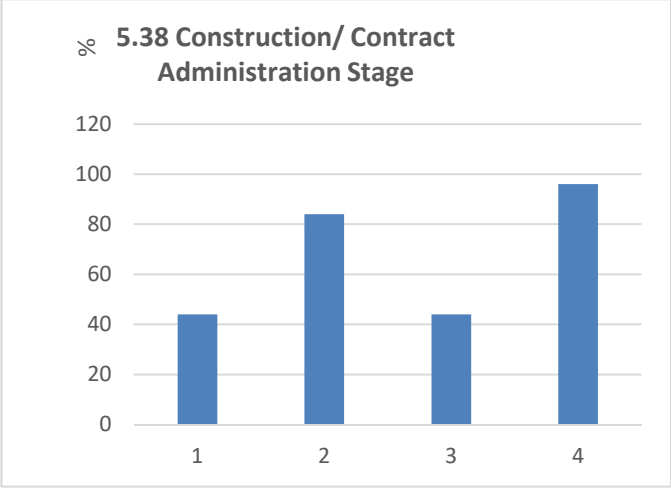


Figure 5.37 Drawings/Specification translated

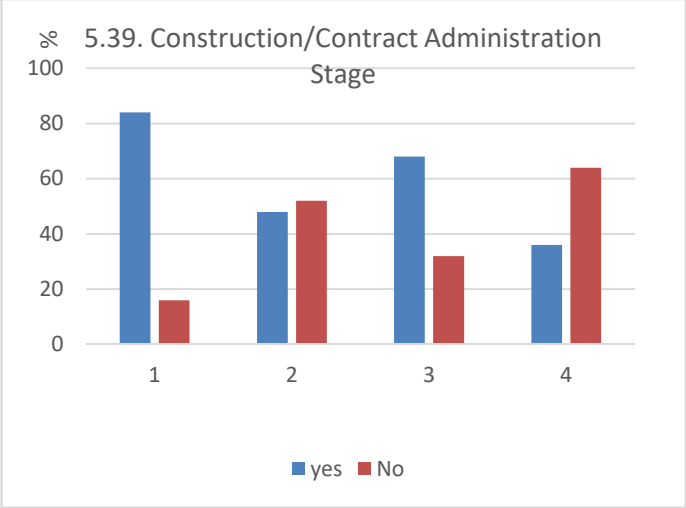
Figure 5.37 illustrates findings of any drawings /specifications and documents written in English that had to be explained or translated to the understanding of the workers. 96% of significant responses confirmed that they had to translate or required translations to understand drawings compiled in English language. Only 4% of stakeholders did not translate or not required translations to understand documents.



	Message types
1	Telephone
2	Letters
3	Log entries
4	Email

Figure 5.38 Project work suffered due to Misconceived message types

Figure 5.38 displays results of misconceived messages conveyed via telephone, letters and log entries on sites as well as emails communicated during construction stage. Most of these communications circulated are regarding technical aspects and payments. 44% of average respondents stated that misconceived messages via telephone conversations are with other stakeholders or consultants. 84% of problems identified while communicating through letters where with ordinary workers or supervisor level staff who possesses poor writing skills in English language and as most of government offices use Sinhala letter formats as well. 44% of respondents says problems arise due to poorly written log entries or due to misunderstanding / difficulty in reading found in site staff when instructions are written in English language. E mail is also a significant cause of creating misconceived messages. 96% have identified the magnitude of poorly written emails or poor reading/understanding skills of site staff and other stakeholders such as suppliers' representatives, sub-contracting parties and other linked government organizations who faces difficulties most.



	Problem encountered
1	Delays in the project
2	Extra works involved
3	Additional cost involved
4	Effect on quality of work

Figure 5.39. Problems due to poor communication

The above Figure 5.39. depicts problems that rise due to poor communication skills of workmen/labourers. 84% says that delays occurred due to poor communication skills. 48% thinks extra works occurred due to communication problems. 68% of respondents have experienced the problem of additional cost involvements in this stage due to language problems and 36% says that problems related to work quality also occurred due to poor language usage in construction work.

5.2.2.4 Language Skill Training Stakeholders

Figure 5.40. Participation of any Language skill training programs.

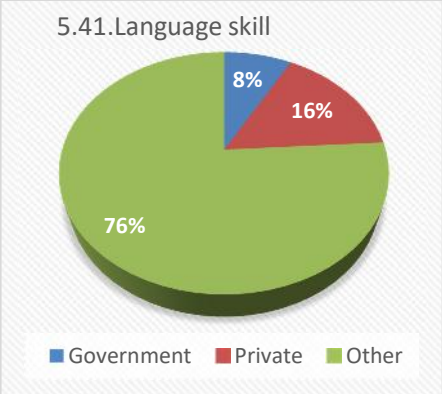
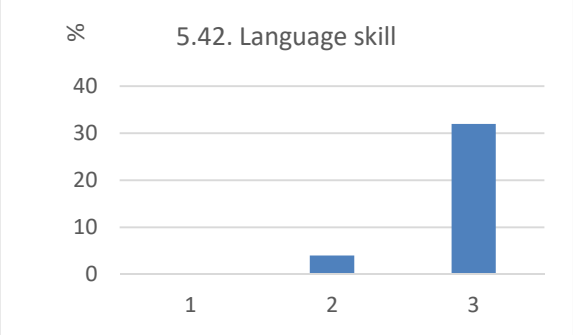


Figure 5.41. Participation of any Language skill training

Figure 5.40 illustrates participation of stakeholders in construction industry in language skill training programs. According to the survey only 40% of respondents have participated in such training programs and majority of 60% have not participated at all.

Figure 5.41 shows the parties/ bodies who conducted such training programs for stakeholders in the construction field. It is surveyed under three categories namely Government sector, Private employers and other language training courses. Out of 40% of participants who has participated language training programs showed in figure 5.4, 08% have participated in Government held training programs. 16% participated in training courses conducted by private employers. The balance have participated in other language training courses based on their personal stipulation.



	Frequency of participation
1	Monthly
2	Quarterly
3	Other

Figure 5.42. Frequency of Training programs

Figure 5.42 shows the frequency of training programs conducted by Government sector and Private Employers. Participants were inquired of partaking in such programs on monthly and quarterly basis as well as other course durations. None of the respondents have participated in such programs on monthly basis but 4% on quarterly basis and 32% on other preferred course durations are identified.

5.2.2.5 Ensuring good Language Skills of staff/workmen in the industry

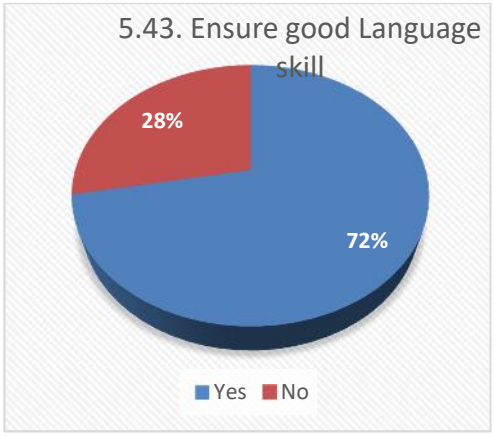


Figure 5.43 preference to testing of Language skills

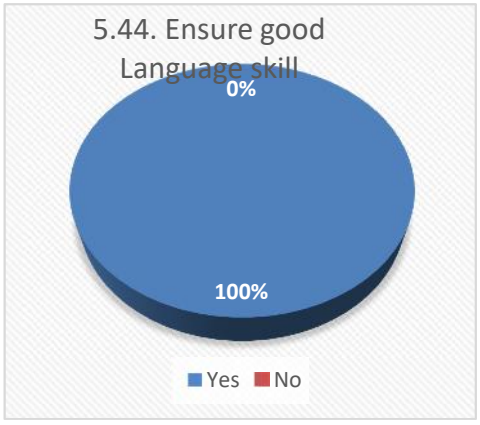
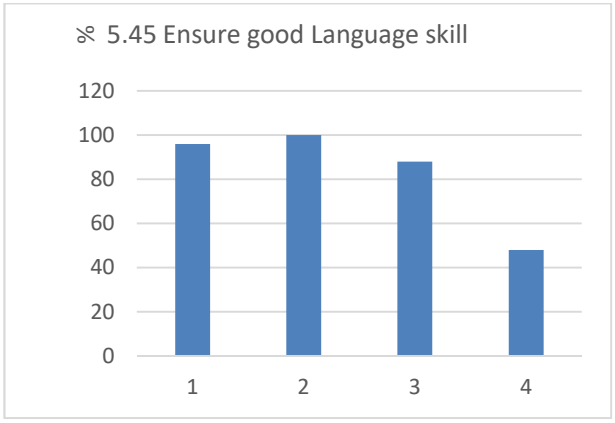


Figure 5.44. Preference to language training

Figure 5.43. illustrates the preference of respondents on testing to ensure good language skills of staff / workmen in creating a better working environment.

According to figure 5.43. a majority of 72% stakeholders prefer language skill tests to be carried out for new recruits while only 28% of respondents thinks it is unnecessary.

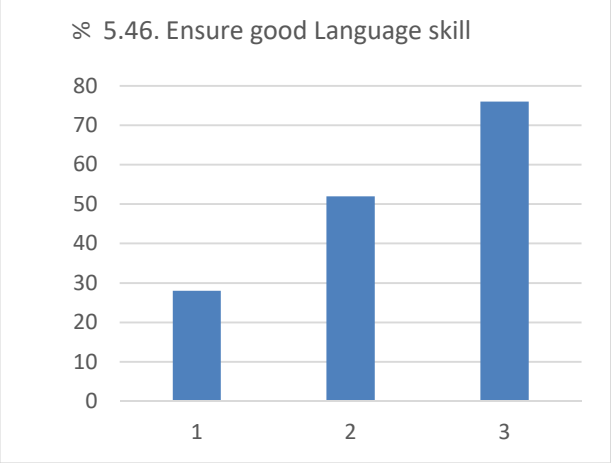
According to figure 5.44, 100% respondents thinks that language training is essential for staff in all disciplines in the field.



	Test type
1	Speaking
2	Writing
3	Reading
4	Listening

Figure 5.45. Preference Training areas

Considering Figure 5.45, it is evident that 72% of above respondents prefer language skill tests to be carried out at interviews. 96% think it is important to test them on speaking. A significant 100% of respondents think it is a must to carry out written tests at the interviews. 88% of respondents insist that reading tests should be carried out while 48% think listing tests should be carried out since proper understanding of instructions given via different communication medias such as telephone is also important.



	Test type
1	By the Government
2	Personal
3	By the Employer

Figure 5.46: Preference Training areas

Figure 5.46. Shows the result of preferences of financing English language training programs in the industry. 28% thinks respective Government bodies should carry out such programs while 52% thinks personally staff members attend to private classes to improve their knowledge according to the work they involve. 76% of majority thinks Employer should arrange language training programs for employees who need improvements of language skill which benefit to the respective companies by increasing communication efficacy.

5.3 Results chart

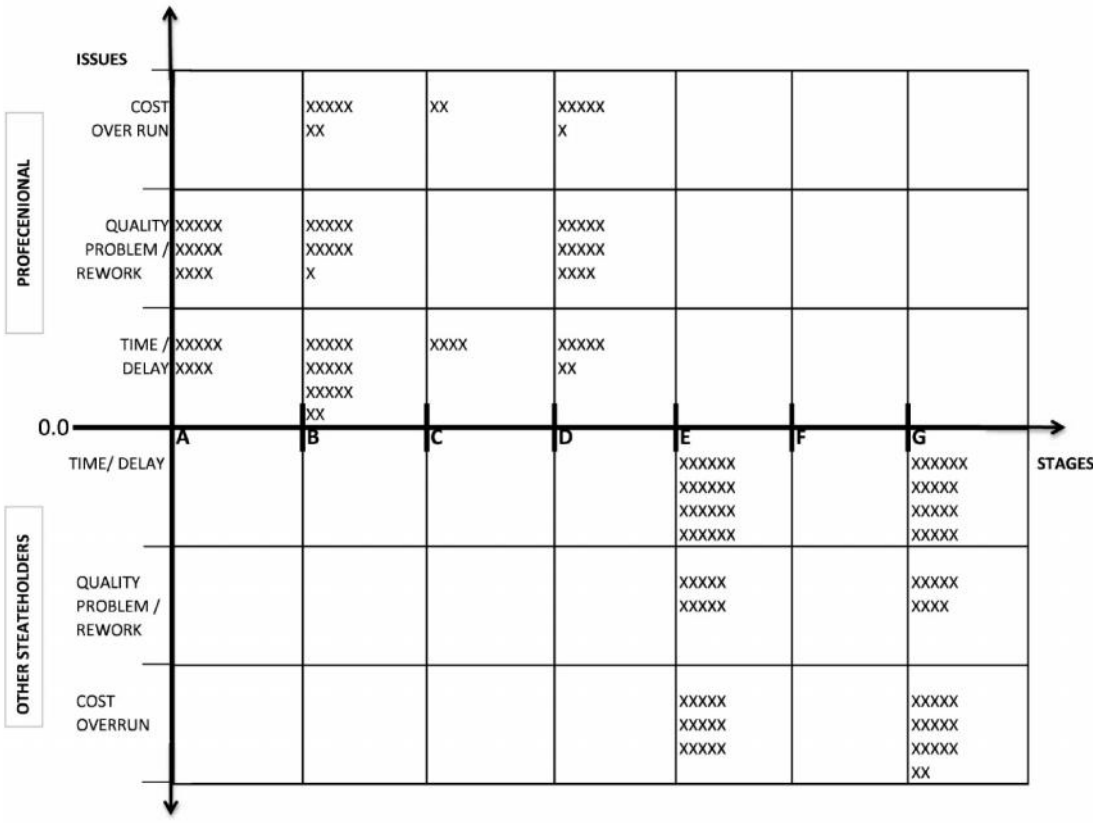


Figure 5.47 Result chart

Professionals and Other stakeholders

Stages

A - Schematic Design stage

B - Design Development stage

C - Council permit stage

D - Preparation of working drawings

E - Preparation of tender documents

F - Bidding and Negotiations

G - Construction stage

Issues

1 - Delay / Time overrun

2 - Rework / Quality problem

3 - Cost overrun/ misinterpretation / re-submission

5.4 Validation in this research

Various procedures were adopted to achieve the validity and to maximize the reliability in the current research. Data were collected from multiple sources in a cross section of the industry namely developers, contractors, designers, engineers and quantity surveyors as well as across the hierarchy of organizations such as senior executives and middle level managers. Furthermore, interviews, case study and inclusion of quantitative data through exploratory study are aided to achieve validity and internal reliability of the data.

5.4 Summary

In this chapter, qualitative and quantitative data were analyzed focusing on key objectives of the study. The findings of case study analysis are sporadic with a stage by stage data analysis, to elaborate data in graphical formats.

Chairperson of the Client's party, principal consultants and main contractor responded as employers. All others remained as employees in the questionnaire survey.

Professional's category commented for the entire procurement process while the other stakeholders were questioned mainly at the construction phase. According to the analysis, findings proved that there are problems in Government building construction projects due to poor language skills. It is further established that such problems occur mostly during the construction phase and primarily due to staff of the Client's party and secondly due to staff of the Contractor's party.

CHAPTER 6. CONCLUSION AND RECOMENDATIONS

6.1 Introduction

This chapter presents deriving at a conclusion of this research from research finding achieved in the proceeding chapter. Furthermore, this chapter elaborates the summary of the research process, enabling arriving at the outcome. Hence, conclusion includes revisiting the objectives where they are persisted through the research findings. This research is to identify problems related to communication and language skills in government building projects in Sri Lanka. Also analyzing same to find most critical stages of construction process and category of the team members who needs improvements is targeted. Focusing towards this aim, certain objectives were established. In addition, solutions to overcome such problems are also discussed on arriving at the conclusion. The conclusion describes accomplishment of each objective together with research findings leading to recommendations.

6.2 Revisiting the Objectives

Objective 1 - To identify communication and language skill problems in government building construction projects.

Objective 1 of this research was accomplished through the Construction Project Culture focusing on Project Team in Chapter 3. This was carried out along with the findings from literature review which assisted to understand background of the construction field and project teams. Also, this was further analyzed by Semi-structured interviews by questionnaires survey in Chapter 5. Data analysis as well as Case study insights also help to achieve objectives in the study.

Findings concluded that there are many problems arising due to poor communication and language skills owing to Government Sector Client's party and contracting parties.

Most of the Client's party team experienced problems related to understanding and communications. Secondly, Contractor's clerks and site staff found difficulty in both understanding and communication due to inadequate language skills in general.

It was found that there were problems encountered in drawings due to inaccurate or improperly correlated notes. This emphasizes poor writing skills which led to resubmissions and corrections. There were many problems found in report writing, letter writing and responses, specifications in drawings, schedules and Bill of Quantities with poor writing skills in moderate levels in first stages of Government building construction projects.

A significant level of problems is encountered due to poor spoken skills that are found regarding responses to telephone conversations during construction stage. Most of the information and decisions that should be taken quickly and effectively to support the smooth flow of the project is hence disrupted. Responses to letters, confirmations and finalizing matters in writing also is challenged in a substantial level due to misconceived messages received as identified in the case study as well. Site staff and Client's representative/site supervisors also need considerable improvements in spoken, written and reading skills in order to read, understand and correspond log notes and written instructions in English.

According to the survey it is evident that most critical problems arise and delays occur when communicating via emails. Such glitches ensue owing to lack of knowledge in understanding and replying to emails precisely. Most of the time the replies are late. The parties concerned are also reluctant to reply due to poor writing skills in English. Though emails allow receiving confirmations quickly than using other communication methods to expedite the process and avoid disputes it does not materializes as required.

Objective 2 - To analyze communication and language skill problems arising from lack of professional and occupational competence along with lack of standardization and modeling in the building construction process.

Objective 2 was accomplished through data received from the Semi-structured interviews through questionnaire surveys in Chapter 5. This is supported by data discussed in Construction Project Culture under project organization, project management skills, project team and causes of ineffective communication in Chapter 3. Case study illustrates problems arising due to lack of occupational competency of the government team members in project work. Respondents in two categories were aware and have experienced professional and occupational competencies in their respective disciplines. It was evident that language skills of other stakeholders were more challenged than professionals in the industry during the construction process due to medium of education and level of education. They fail to reach technical and practical standards of modern day group performances and communications.

Consultant's team drafting people are identified to have problems in preparation of drawings and specifications due to inadequate language skills. They also possess an inadequate knowledge about standard technical terms in English. It was significant that communications via written documents in English such as letters, notes and specifications suffered at a moderate level throughout documentation stages. The Client's party can be held responsible mostly for this which occur due to poor writing and reading skills.

Very minimal number of problems are recorded during Council Permit stage due to problems related to language skills since most of the documents and forms are in Sinhalese language. Also, documents / forms written in English are in a standard format with standard procedure that all are required to follow. Mostly, Consultants oversee these submission documents closely. Besides only the Client, Consultant Architect and Structural Engineer are involved in this stage.

Most of the drafting errors, miscommunication in schedules, erroneous notes and details were found due to lack of standardization and exposure by similar models in occupations namely the drafts persons, project coordinators and clerks at

documentation stage up to construction stage. It is required that the standard documents are written in English language. However, it is experienced at many stages that Client's party staff needed translations though technical and legal documentations are carried out in English as a standard. Hence to them and their responds such documents are issued in Sinhala language.

A negative impact on overall project work was recorded during preparation of tender document stage. It was found to be at a moderate level due to poor language usage in written documents and verbal communication.

Most critical problem in the construction stage was delays in the process which leads to extra cost, according to the analysis as well as mentioned in the case study. Reasons for many delays include late response to design, cost confirmations according to the survey and misinterpretation of written instructions at the site where construction work needed rework and rectification. It is significant when the line of communication breaks and hierarchy of team structure does not perform their duties as and when necessary.

Poor communication skills of workmen effects quality of work. Also, extra works lead to extra cost and delay in completion respectively.

Objective 3 - Find most critical stages of construction process affected by communication problems and identifying which category of the team members need improvements most, for problem resolution.

Objective 3 was attained via Semi-structured interviews by questionnaires survey (Refer Chapter 5). This is with due consideration to the entire procurement process examined on professionals on all stages. It is done mainly focusing on construction stage with other stakeholders where most of the parties join to obtain a physical implementation. It was evident that most of the communication problems arises at construction stage. Hence almost all the parties who contribute in the project are involved at this stage. Referring to contents described in Chapter 03 with due regard to Project organization and project team, Building project team and organizational

structure, the questionnaire survey identifies the category of the team members who need improvements most.

It was identified that Client / Client's party team critically displays poor language skills as identified in the case study. Secondly the Contractor's party representatives and workers has a significant level of language skill problems. Consultant's drafting people also indicated poor language skills at a moderate level in latter parts of the project. Whereas according to the collected data, at initial stages of the project minor level of problems were identified during involvement of the Consultants.

It was identified that significant problems in design and drawing revisions occurred due to misunderstanding over instructions during schematic design stage between Client's representatives and Consultant's drafting staff. During design development stage delays were more significant due to delay in finalizing documents and drawings with regards to written responses in English language. It was recorded that minimal number of problems arose during Council permit stage.

By examining the entire procurement process, according to professionals, most of the drafting errors, miscommunication in schedules, notes and details were found during preparation of working drawings transpired due to poor language skills in understanding instructions communicated in English.

In general, regular communication problems and errors were repeated by Client's party at a significant level and Contractor's party at a considerable level.

Negative impact on the project work due to poor language skills of the Client and Contractor is recorded at moderate level in bidding and negotiation stage where the Contractor is introduced to the project.

Most of communication problems and misinterpretations are recorded in the Construction phase where number of parties from all the relevant disciplines contribute to the project. According to the response from other stakeholders including civil engineers, drafting staff, supervisors, workers and project coordinators representing Client's, Contractor's and Consultant's parties it is confirmed that most significant problems take place due to poor language skills in the construction stage.

Objective 4 - Identify and understand communication problems due to lack of language skills during a project and discuss solutions to overcome such problems in the context of construction project culture.

Objective 4 was accomplished through the data received from the Semi-structured interviews obtained through questionnaire survey mainly from professionals (refer Chapter 5). Respondents were aware of communication problems and were willing to discuss about suggested solutions to problems in the industry which are indicated in Chapter 05.

Problems related to language skills were identified in all four categories namely writing, spoken, reading and listening. Problems related to writing and understanding by drafting staff were recorded in schematic stage and design development stages.

In preparation of construction working drawings and tender document stages significant problems were identified associated to communication between Client and Consultants due to poor writing, understanding and reading of documents and drawings.

Problems are identified during construction stage regarding communication among the Client's project coordinators, clerks, assistants and Contractor's site staff including site supervisors, workers and service suppliers due to poor understanding of writing and spoken skills which were significant in minutes of meetings, emails, letters, log notes and telephone conversations.

It was concluded that poor written skill is the most critical problem. Secondly problems were created due to inability in spoken English of the team members. In government building construction process, most of the staff of government Client's party are familiar and use Sinhalese language but not English. But all the standard documents, drawings, communications such as emails, letters and confirmations from various parties are generally given in English language. Problems arises regarding poor spoken language skills that are linked to telephone conversations and meetings where most of the miscommunication happens. Also, it is noted that parties are reluctant to express their views due to poor language skills.

Suggestions to resolve problems owing to poor language skill usage in building construction projects were discussed with professionals and other stakeholders. Solution in general is to conduct a language skill test at the recruitment interviews and select only capable candidates. Also, continuous language improvement programs and training to be given to selected staff relevant to the field. Additionally, the new recruits should work under experienced seniors with good command of English language skills. They can also be referred to online or recorded industrial communication tutorials on regular basis and obtain feedback on top. These training can be regularly arranged by both private or government employers. The staff must be encouraged to train in private institutions as their preference of language skill development. Hence, they gain an opportunity to perform competitively in the field to get selected to the next project. Mostly assistants, clerks and coordinators should possess good language skills in English than minor staff and workers.

6.3 CONCLUSION

In this study it is evident that there are many problems created due to poor language skills and communication problems in building construction projects which will be critical in the future with rapid developments.

Analysis of responses proves there should be solutions and improvements in the industry towards an overall productivity and efficiency which is beneficial to all parties concerned.

It was suggested to conduct language skill tests in English for writing, reading and spoken categories when recruiting employees to government or private employers for construction field work. Second suggestion is to improve language skills of selected candidates and existing staff related to the industry. Improvements in spoken language and written skills regarding standard documents, letters, emails and other technical documents is also to be implemented in English training courses on regular basis. Thirdly, give necessary exposure to employees in the field under the guidance of knowledgeable senior staff with good language skills. Thus, junior staff and staff with

poor language skills who are required to be familiar with technical standards can improve. Since all professionals and employers prefer to recruit staff with satisfactory level of English language skills; ability of employees can be improved with industrial based language skill development programs that are conducted regularly.

It should be noted that Government institutions should conduct regular language training programs to improve government sector staff and construction field staff to support effective work on their continues construction projects.

With improved language skills work quality can be improved by having a proper understanding the work, sharing knowledge and team performance. Such attributes will not only benefit the stakeholders in each construction project, but also will increase the overall productivity level in each construction site.

In the present day, a higher proficiency level in the English language allows a higher advantage in employment and confidence to work within a team. For the betterment of the country at large as well as for the construction industry, the best solution is to minimize problems regarding poor language skills. It is beneficial to offer industrial based language training programs which will be supportive to the workforce who are helpless and lack competence in English language skills. Thus, all stakeholders can contribute to the growth and progress of the nation with confidence.

6.4 Recommendations

Based on the matters discussed in the case study in chapter 04 and outcome of the questionnaire survey discussed in chapter 05, the following recommendations are suggested to obtain better communication channels that can be created in government building construction project process.

6.4.1. Testing and selection criteria

It is recommended to execute certain selection tests to recruits at interviews. In the construction field, team members of various categories to be ascertained on language skills according to the need of each individual to comprehend in performing their

duties and responsibilities. Based on this criterion, it is essential to test new employees to a job on written and spoken skills. Mainly professionals, assistants, coordinators and clerks should possess a good command in English language to work and guide lower level staff and workers towards project successes.

6.4.2. Selection to a project work and hierarchy of the team

Selection of the team for a particular construction project should be done carefully considering relevant professionals and supportive staff in adequate numbers considering based on their technical knowledge and communication skills to comprehend the given tasks. Mangers by experience can select such teams assigning them to relevant duties with due regard to their knowledge in the field and language skills. Project manager or the coordinator of the team should be well knowledgeable with construction as well as possess effective communication skills and recruit staff accordingly. Selection of a Consultant along with the drafting personnel and assistants who should coordinate from Client's project coordinator to site supervisors also must be selected based on technical and communication skills. When selecting a Contractor, Client and Consultant both should have a common concern over the communication ability along with capability, experience and knowledge of the Contractor and his team. When selecting site staff, it is necessary to employ a site supervisor with general comprehend of communication skills. His skill of communication and translation ability with workers under him is essential to avoid miscommunications that can occur at work.

6.4.3. Improvements and training

Selected team members should learn continuously from experienced staff and seniors with good language skills. Working with expertise and joining for language training programs is essential to obtain improvements in technical and communication skills of staff who are lacking language fluency. Regular trainings can be arranged for staff who has very poor language skills. Thereafter, training workshops and courses with different durations varying from six to three months can be arranged for the ones who prefer further improvements to their communication skills. The enthusiasm shown in such personnel can be positively identified with increments and promotions at

workplace. Also, training programs can be arranged by employers within the organization. The government authorities have the ability to obtain government teaching / training institutions to organize such programs for their employees. Staff also should be encouraged to learn through online aids and private classes / training courses to build their personal communication abilities.

6.4.4. Feedback on improvements

It is necessary to check on the feedback of training programs followed by employees on a regular basis, to ensure that there are improvements due to participating in such programs. It will help improve such programs and update the administration about the quality of training they offer during these courses.

Feedback and improvements on language skills will also ensure easy recruitments and service providing on all parties concerned in the construction industry. Consultants will be confident to work with contracting companies with better abilities. Clients will be more comfortable to award contracts to them. Similarly, Clients also would prefer to select Consultants, who have competent staff and assistants to conduct construction duties for their projects. Furthermore, it will create more effective and a smooth environment for the Consultants and Contractors to work with Clients who possess good language skills which will ensure ascertained cost, quality and time during the process.

Continues training and improvement programs that create effective communication and language skills training will benefit everyone in the construction fields which will serve every aspect of work concerned.

6.5 Summary

This chapter concludes the outcome of the entire study, case study, data analysis and suggestions from professionals and other stakeholders. What the Professionals experienced, the problems they encountered and suggestions made by them regarding problems related to language skills during the entire procurement process to ensure a

proper work environment is discussed and concluded here. Experiences and ideas regarding language problems and suggestions to improve same were mainly discussed in this chapter. This also focused on the construction phase where various stakeholders take part.

The key findings of this study were the types of problems encountered along with identification of parties and stages where critical problems are visible due to poor language skills together with suggestions to overcome such problems in future projects.

Professionals and stakeholders from all parties concerned namely the Client, Consultant and Contractor in this survey have recommended tests to be carried out when selecting new candidates and introducing training programs to improve communication skills of selected employees to maintain a dynamic work environment, which is essential in Sri Lankan government building construction field.

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APPENDIX – A

Questionnaire for the Semi-structured interviews with Professionals

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APPENDIX – B

Questionnaire for the Semi-structured interviews with Other Stakeholders

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