



THE IMPROVEMENT OF INDUSTRIAL RELATIONS AND  
THE IMPLEMENTATION OF MOTIVATION FACTORS ON  
THE CONSTRUCTION PROJECT TEAMS CAN DRIVE THE  
CONSTRUCTION INDUSTRY IN HIGHER LEVELS OF  
PRODUCTIVITY

By

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# **The Improvement of Industrial Relations and the implementation of Motivation factors on the Construction Project Teams can drive the Construction Industry in Higher levels of Productivity**

## **1 Introduction**

The present dissertation is part of the Postgraduate Program of MSc in Construction Management of “Neapolis University of Pafos”.

The dissertation subject is the “Improvement of Industrial Relations and the Implementation of Motivation Factors on the Construction Project Teams can drive the Construction Industry in Higher Levels of Productivity”.

### **1.1 Aim of the Dissertation:**

Analyze of factors that affecting the employee’s behavior in Construction Project in relation to improved Performance.

### **1.2 Objectives:**

1. Evaluation of employees’ satisfaction based on their relationship with their superiors, colleagues and subordinates in manner of corporation and communication but also in the general environment of the company they are part of.
2. Critical examination of the Superiors’/Managers’ attitude towards employees, the level of organizing and the effectiveness in giving orders.
3. Evaluation of employees’ productivity and the allowances of improvement
4. Examination of the existence of motivation on behalf of the company that drives the employees in higher level of productivity and the type of motivation that the employees are suggested for such improvement

### **1.3 Literature Review:**

Chapter 2: The significance of Construction Industry in the sector of economy is described in this chapter, with a general reference to the Industry’s participants in manner of activities and services. A flashback in Construction history and the main differences between construction project teams with other industries’ teams are presented. Each phase of construction is described in the section of project’s life cycle, from the initiation of a project to its completion and delivery.

Chapter 3: In the third chapter the importance of the existence of the project teams is stated, and the participants of each team are presented. Characteristics of each participant and the supply chain members, along with their responsibilities are described.

Chapter 4: Human factors that affecting the performance of individuals in a project team are analyzed focused on the individual's personality and behavior. Individual's performance can be improved by several types of motivation stated in chapter 4 and expressed by theories of motivation that where stated and practiced along the time.

Chapter 5: The methodology that was followed to obtain the objectives of the dissertation is described along with the results adopted from field research in chapter 5. Qualitative and quantitative research method was used and the responses noted in the field research formed the charts and likert scales results.

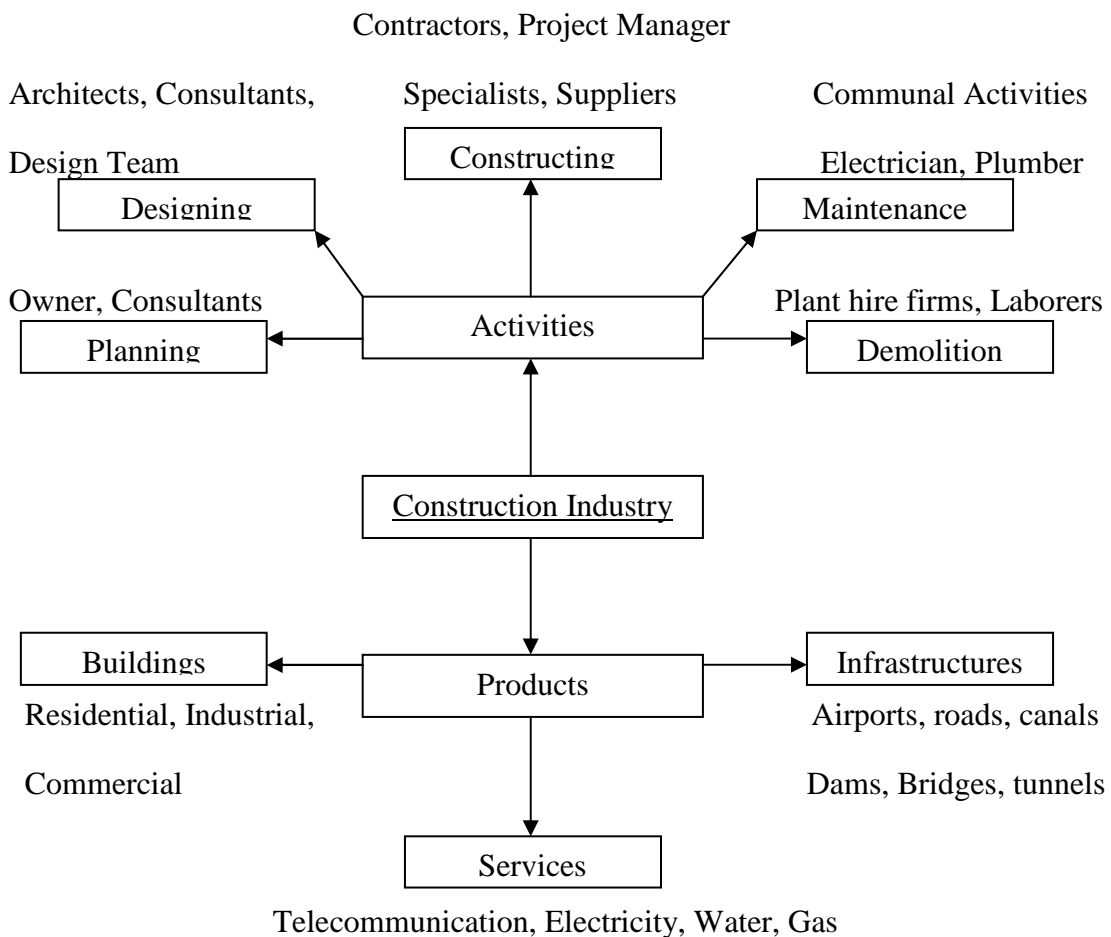
Chapter 6: Conclusions of the dissertation were formed in combination of the desk research and the field research results and the suggestions arising from the analysis are presented in chapter 6.

## 2 Construction Industry

### 2.1 Construction Industry

Construction Industry is an important sector of every economy. Is characterized by researchers as a “Service Industry”, based on its abilities and needs in assembling what other sectors of economy produce. (George Ofori, The Construction Industry: Aspects of its Economics and Management)

Construction Industry is a multifunctional sector of economy which plans, designs, constructs, alters, maintains, repairs and at the end demolishes buildings of all kind. It includes professionals, consultants, material suppliers, plant hire firms, material and equipment manufactures and public agencies. (George Ofori, The Construction Industry: Aspects of its Economics and Management)



**Diagram 1 Aspects of Construction Industry**

(Based on: George Ofori, The Construction Industry )

The technological development of the last years, the introduction to the market of new ideas and materials, the divergence towards the protection of the environment and Green development in combination with the arrival of new entrants in Construction Industry had driven to an increase of the professionals involved in the procedures and at higher levels of responsibilities. (Frederick E. Gould and Nancy E. Joyce.2009.'Construction Project Management) The results of these were the demand of better organizing in determination of roles among participants and teams, higher levels of corporation with other participants, higher levels of knowhow and increased technological skills and more effective means of monitoring the activities which are happening in a construction project on behalf of the managers. (Tim Cornick and James Mather. 2009. Construction Project Teams, Making Them Work Profitably)

## **2.2 History of the Construction**

By the passing of the time and due to the development that appeared allowed human to move from the caves and started creating their own shelters by the use of natural materials which were taken from the ground.

Since the time that human started creating civilization and started taking advantage of his power and influence on others, the development of bigger constructions started by the use of man force. Such use of the man force is shown in the early years in the construction of pyramids. The man was forced to work in groups under the pressure of his master and his whip facing every day the fear of death. Even in this example the masters of the man force were using an organization system and fear motivation so as to achieve the construction of a complicate structure such a pyramid although the conditions were inhumane. (Tim Cornick and James Mather. 2009. Construction Project Teams, Making Them Work Profitably)

## **2.3 Construction Project Teams differences with other industries' teams**

Is shown from the previous example that construction started from the early years of the existence of man and therefore it can be characterized as the oldest and most traditional industry than all the others. It needs a large number of man force and more time to produce its product, without having the opportunity for big and easy changes, especially if a product is such as a pyramid or a skyscraper. The time related to the construction depends on the complexity of a building and so is the cost of constructing such a project, which is the most expensive product in the market. Any kind of projects are developed in different

places by different contractors and organizations, facing difficulties on site and extremities due to weather conditions or site conditions. The project teams involved in a project work from different places as a result not having a continuous contact with each other and the time they meet to cooperate sometimes is not sufficient. These reasons are that which separate the construction industry from all the others and that is why the teams which are involved in the procedure of construction play a significant role from the beginning to the end of a project. (Tim Cornick and James Mather. 2009. Construction Project Teams, Making Them Work Profitably)

#### **2.4 Role of the organization/ company**

A significant role plays also the company or organization which is responsible for the construction and turnover of a project. A specific policy and organization structure must be followed where the mission and goals of the company or organization are clear and which must be transferred and explained in the project teams that are involved in the whole procedure. Mechanisms must be introduced for the control of the quality of each activity of the construction phase, the minimization of the expenses so as the project to be kept in the agreed budget and the time schedule so as the project to be delivered in time.

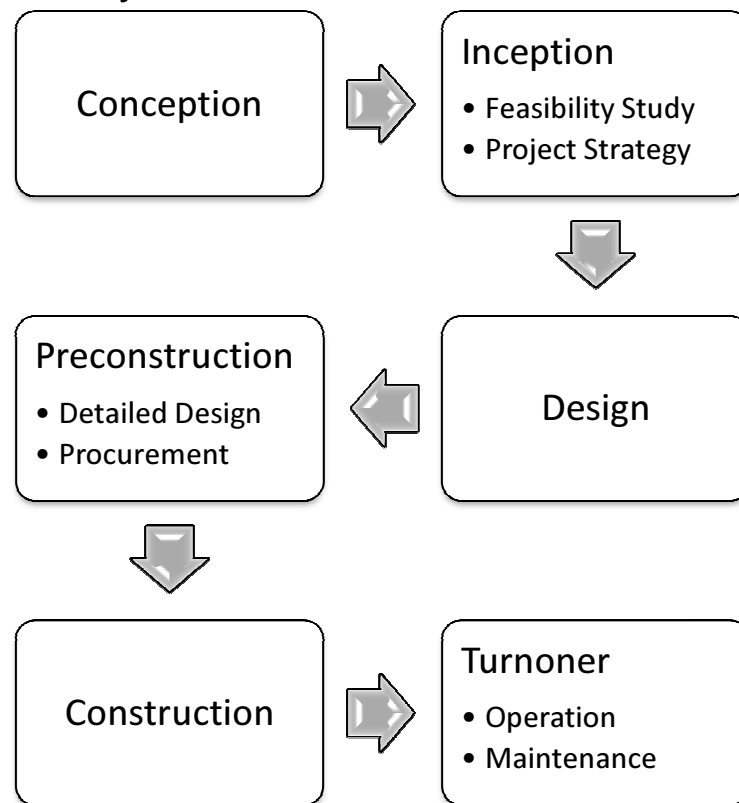
During the project's life cycle, a lot of people with different specialization are involved and obliged to contribute and cooperate with the others. Depending on the method that will be followed in the preconstruction and construction phase, the responsibilities of each one and their team are proportionate.

On later chapters will be discussed which are those project teams, what are their responsibilities and obligations and how they affect each other in the project's processes.

In the Construction Industry as mentioned in the introduction, a large number of participants are involved of many sectors and specialties. (Frederick E. Gould and Nancy E. Joyce, 2009) Therefore to be able someone to understand whatever and whoever surrounds the Construction Industry an analysis of the construction procedures must be followed.

Each participant of the project has his timing in entering the procedures.

## 2.5 Project's Life Cycle



**Diagram 2 Project's Life Cycle**

(Frederick E. Gould and Nancy E. Joyce.2009.'Construction Project Management')

### 2.5.1 Conception Phase:

Before the initiation of any procedures a general idea for a project is introduced to be studied. The idea can be introduced either from the sponsor of the project on his own or with the advice of a consultant. This idea is going to the next phase for a more detailed study.

### 2.5.2 Inception Phase:

In this stage, a more detailed study of the general idea takes place, in order to be developed and specified. Is the phase where the purpose of the project must be clarified, in manner of budget, operation, and financing by specifying the objectives and aims of the project. A feasibility analysis will take place where the opportunities of the project will be studied, in order to calculate the promised profitability of it, in combination with the market demand, which will be obtained by a macro environmental analysis. The aims of the project and how is going to be introduced in the market will form a strategy plan in which mechanisms will be applied for monitoring and controlling the procedures. This phase involved many participants from the client and his consultant, the designer's and economist's advices to

the information taken from a banker. Since the matter of financing and profitability were studied a decision must be taken, where to continue with the project or not.

### **2.5.3 Design Phase:**

Since the decision to be taken was to proceed with the project, a completion of the design must be done. The whole concept that was created must be translated in drawings, analyzed by the engineers and be approved by the local authorities. Architects and design team are involved and have to cooperate with structural, electrical and mechanical engineers where they will transform the project in the discipline of the local authorities' rules, the health and safety obligations and the European Union's legislations.

### **2.5.4 Pre Construction Phase:**

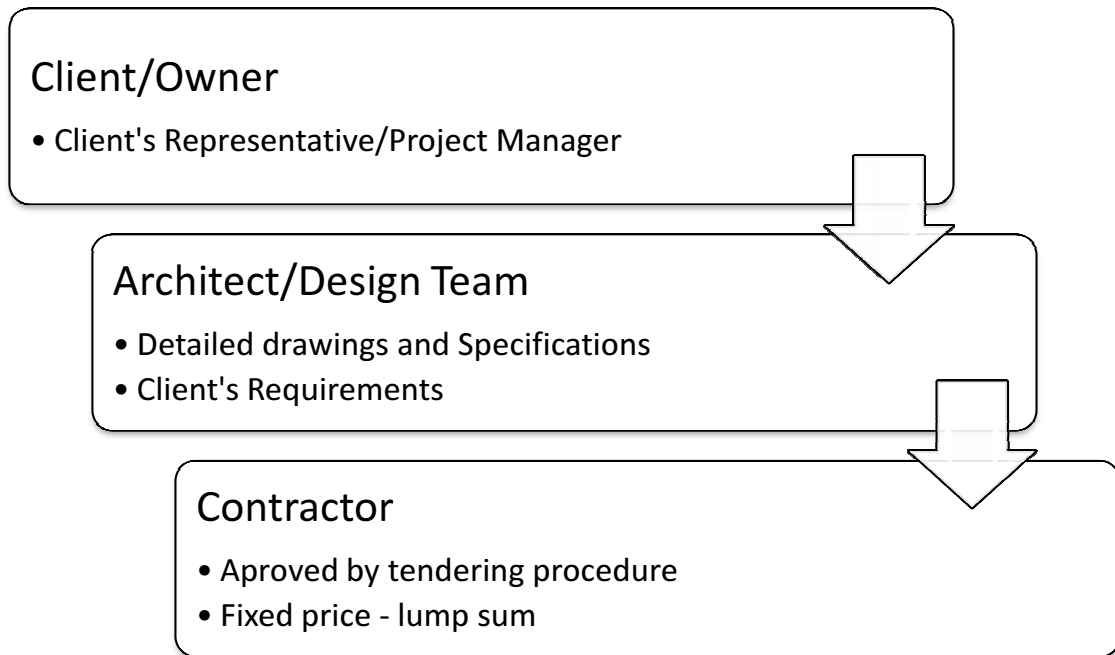
After the approvals from the local authorities for the Town Planning and Building permits, the procedure goes in the next level which is the pre construction. Detailed drawings and construction documents along with specifications must be formed. Engineers, architects and specification writers are involved in this procedure.

### **2.5.5 Procurement:**

The process of finding and purchasing materials and equipment that are going to meet the project's specification are taken place in the procurement procedure, along with the recruiting of personnel and subcontractors by the tendering procedures, which are going to form the workforce for the project. (Frederick E. Gould and Nancy E. Joyce, 2009) There are three types of Procurement methods. The difference in the procurement methods are the people or teams that the client will employed for the specific task, their type of contract, and the main supervisor of the project. The main procurement methods are:

#### ***2.5.5.1 Traditional method:***

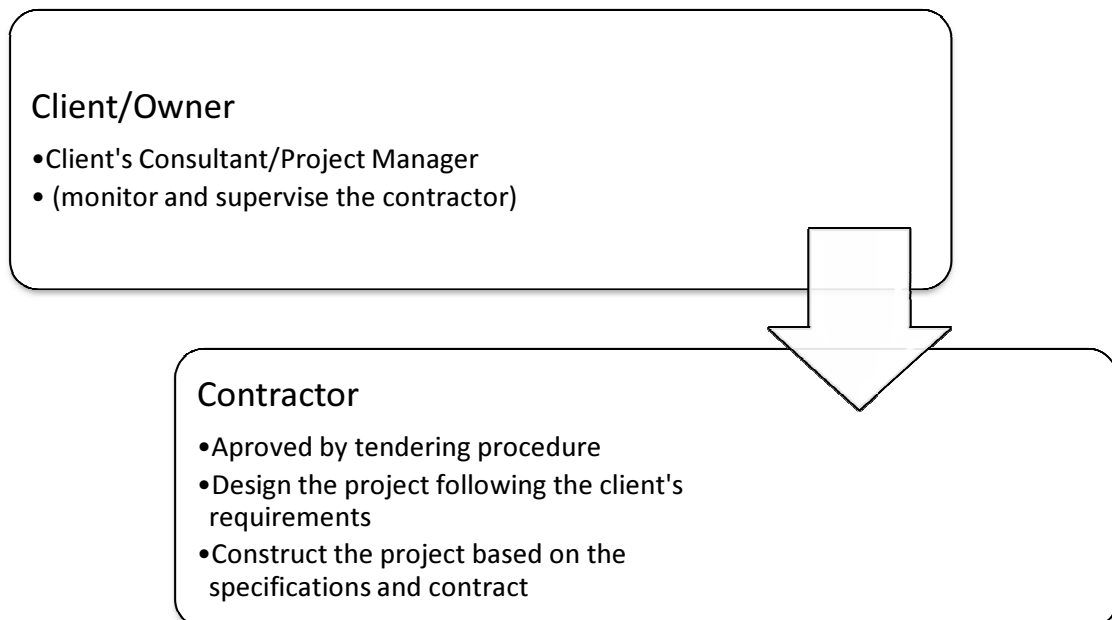
The client is recruited an Architect or a design team for the drawings and details, the specifications and the client's requirement for the project and therefore the tendering process follow where a contractor will be chosen. The client can employee a consultant for the whole procedure.



**Diagram 3 Traditional method of Procurement**

#### **2.5.5.2 Design and Build method:**

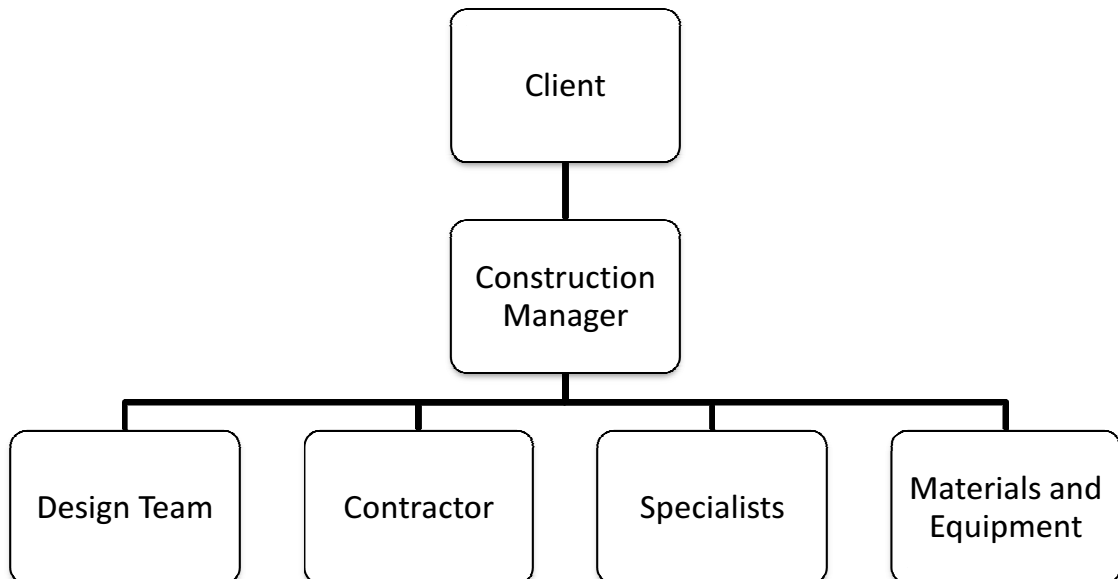
In contrary with the traditional method, here both the designing and building of the project will be done by the approved contractor, who is going to follow the client's requirements. Again the client must employ a consultant to monitor and supervise the contractor.



**Diagram 4 Design and Build method of Procurement**

### 2.5.5.3 Construction Management:

A different method than the two previous since the client can recruit a Project Manager who is responsible of the whole procedure, by finding and approving design team, the contractor by the tendering process and approve the specialists and their method. The supervision of the project is again the Project Manager responsibility.



**Diagram 5 Construction Management method of Procurement**

### 2.5.6 Construction Phase:

In construction phase the approved contractor start the preparation of the site with the appropriate requirements and continues with the construction of the project. A supervision of the contractor is necessary and a client's representative is taking action, most of the time as the Construction Project Manager. Mechanisms of monitoring and controlling the construction processes in manner of design, quality, time related, cost and specifications are produced with the Construction Project Manager to be responsible for the appropriate supervision.

### 2.5.7 Turnover of the Project:

Following the completion of the construction phase, the project must be delivered to the client in such a way so as to meet the requirements which were agreed in the initiation of the project. The operation and the maintenance of it are a responsibility of the client where

most of the times a representative of him take action, either as the Project Manager or as a subcontractor from whom the client buys services.

### 3 Construction Project Teams

#### 3.1 Construction Project Teams

The majority of people wishes to be a member of a team. (Arnold, Silvester, Cooper and Robertson, 2005) Maslow's theory describes the human need to belong somewhere and to be able to be part of a team.

Individuals feel stronger to face any challenges if they are member of a team. The feeling of importance, the psychological security and self esteem are given to the members along with the cover of their social needs. (Μαρία Βακόλα και Ιωάννης Νικολάου, Οργανωσιακή Ψυχολογία και Συμπεριφορά, 2012. Rosili)

Project team can be named a group of people working together to accomplish a specific target in a given time. Teams overmatch their members when their target needs variety in skills, judgment and experience. The combination of skills, information and experiences drive them to accomplish their target in higher levels of quality. (Glassop, 2002)

The performance of a project team depends on various dimensions and the main of them are described below:

**Size of the group:** The number of the members of a team depends on the nature of the activities that must be undertaken. Usually a number of five to seven members are more effective since the involvement of the members is recognized and has value for the other members. (Μαρία Βακόλα και Ιωάννης Νικολάου, Οργανωσιακή Ψυχολογία και Συμπεριφορά, 2012. Rosili)

**Skills of its members:** A team must be able to deal with problems and situations that might present at anytime. Its members must be skilled in manner of Problem solving, Technical work, Interpersonal relations. (Μαρία Βακόλα και Ιωάννης Νικολάου, Οργανωσιακή Ψυχολογία και Συμπεριφορά, 2012. Rosili)

**Personality of its members:** The existence or not of different characters of personality and the way that are combined in the structure of the team might influence positive or negative its performance. (Μαρία Βακόλα και Ιωάννης Νικολάου, Οργανωσιακή Ψυχολογία και Συμπεριφορά, 2012. Rosili)

**Determination of roles:** According to the theory of Belbin, there are nine roles that must be satisfied in the team structure for satisfactory performance levels.

**Table 1 Nine Roles of a Project Team**

<b>Theory of Nine Roles of a Project Team</b>
<ul style="list-style-type: none"> <li>• Implementer</li> </ul>
<ul style="list-style-type: none"> <li>• Chairman – Coordinator</li> </ul>
<ul style="list-style-type: none"> <li>• Shaper</li> </ul>
<ul style="list-style-type: none"> <li>• Plant</li> </ul>
<ul style="list-style-type: none"> <li>• Resource Investigator</li> </ul>
<ul style="list-style-type: none"> <li>• Monitor – Evaluator</li> </ul>
<ul style="list-style-type: none"> <li>• Team Player</li> </ul>
<ul style="list-style-type: none"> <li>• Finisher</li> </ul>
<ul style="list-style-type: none"> <li>• Specialist</li> </ul>

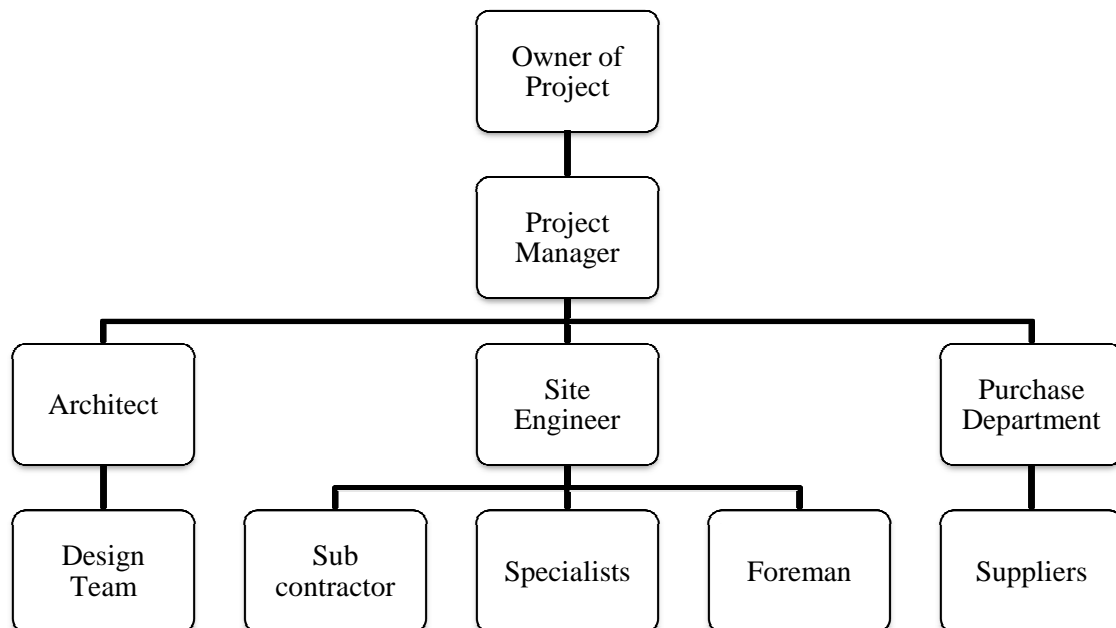
Even though there are nine roles, it's not obligatory to have nine members since a combination of two roles on a member can exist.

**Leadership:** A leader is the soul of the team, where would motivate others, give and take criticism, organize a task, monitor the teams progress and show responsibility. The leaders are characterized as team players, sensitive, creative, confident, organized, trustworthy and communicators. (Diane E. Rossiter, 2004. Leadership Skills)

**Trust:** The characteristic of trust between the members of a team makes easier the corporation and enforce the satisfaction and productivity levels of them. (Costa, Roe and Taillieu, 2001)

**Common Goals:** The goal of a team must be specified and agreed between its members, which would be a compass in leading them in the right path. (Μαρία Βακόλα και Ιωάννης Νικολάου, Οργανωσιακή Ψυχολογία και Συμπεριφορά, 2012. Rosili)

## 3.2 Participants of Project Teams



**Diagram 6 Construction Project Teams**

As mentioned before, in Construction Industry, there are many professionals involved in each phase. They can be categorized as Project Teams, Supply Chain Teams and in general collaborating professions.

The main Project Teams that are involved in Cypriot construction industry are described below:

### 3.2.1 Owner:

Owners can be individuals, who want to construct their own house or an organization, who want to take advantage of an investment based on the market needs, to obtain any profit.

Owners can be divided into Private and Public owners. (Frederick E. Gould and Nancy E. Joyce, 2009)

Funding of a project coming from public money, as government, semi government organizations, municipalities and local authorities can be characterized as Public owner. Money comes from the tax payer and the projects can be schools and universities,

hospitals, roads and communal areas which are designed to be built based on the needs of the demographic characteristics of an area. (Frederick E. Gould and Nancy E. Joyce, 2009)

There are projects which are funded for the benefit of an individual like a house, or for a company for gaining any kind of profit. Such projects can be the houses for living, the development of an organization with intention of selling property to obtain profit and the owners of them can be characterized as Private owners. (Frederick E. Gould and Nancy E. Joyce, 2009)

### 3.2.2 Construction Project Manager:

Keep the company updated for its micro and macro environment, monitor the company's aims and targets, plan, coordinate and control the project from its inception through its completion, secure the clients requirements in order to produce a functionally, financially viable project. Construction Project Manager is also responsible for the study of the project in all its dimensions, from the location and characteristics of field to the collection and improvement of the drawings, the writing of the specifications and to obtain the various permits from the local authorities. The recruitment of the workforce, machineries, specialists for specific tasks, the approval of any tenders, the selection of the appropriate suppliers and materials, the organizing in relation to time and workforce allocation and the resolve of any disputes are under the jurisdiction of the Construction Project Manager.

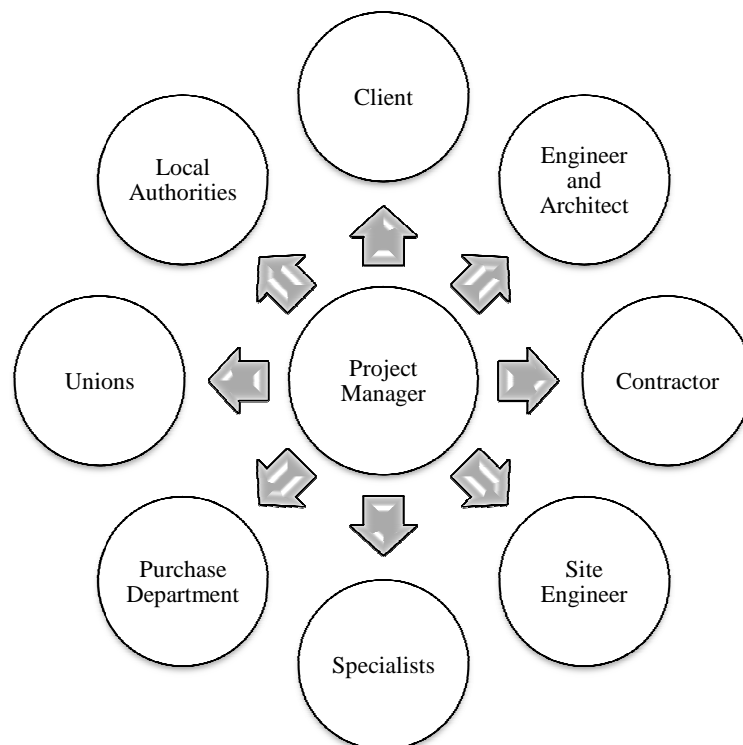


Diagram 7 Construction Project Manager

### **3.2.3 Engineers:**

Engineers play a significant role in the construction of a project since they have to deal with the 25 to 65 percent of the total cost of the project. They must understand the requirements of the owner in manner of budget, operation and durability and produce solutions to satisfy them. (Frederick E. Gould and Nancy E. Joyce, 2009)

Engineers are divided into categories and each one comes to satisfy the requirements of the project according to their specialty.

#### **3.2.3.1 Structural Engineer:**

Their responsibility is to analyze the structure in manner of strengths and identify the sizes of each element of the structure so as to withstand actual forces and phenomena through the time. (Frederick E. Gould and Nancy E. Joyce, 2009)

#### **3.2.3.2 Mechanical Engineer:**

They design and calculate the mechanical installation in the project and meet with the architect to provide solutions in piping of the equipment but also to keep the aesthetic design of the architect. (Frederick E. Gould and Nancy E. Joyce, 2009)

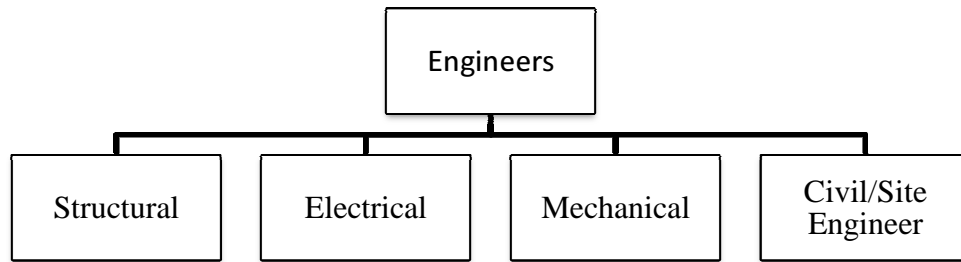
#### **3.2.3.3 Electrical Engineer:**

They are responsible for the calculation of the electrical load taking into consideration the electrical and mechanical equipment, the overall electrical installation and telecommunication and the local authorities restrictions and provide the completed electrical drawings. (Frederick E. Gould and Nancy E. Joyce, 2009)

### **3.2.4 Architects:**

On most projects the architect is the lead designer who is going to meet the owner in the conception phase of the project where the idea will introduced on paper. Owner's requirements are coming to meet architect's ability of translating them and representing them in such a way so any contractor who gets in the procedure of tendering to be able to price, schedule and implement the design. (Frederick E. Gould and Nancy E. Joyce, 2009)

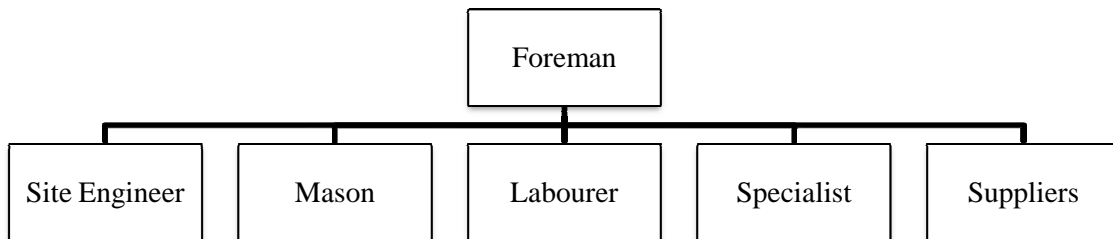
The technological changes and the complexity of the projects and procedures made the work of architect more complicated and the introduction of more professionals like interior designers, specification writers, landscape architects and software operators was necessary. (Frederick E. Gould and Nancy E. Joyce, 2009)



**Diagram 8 Engineer Specialization**

### 3.2.5 Foreman:

Receive all the information from the project manager, start and complete the construction phase of the project, monitor the work force and specialist involved in the project, resolve any disputes and if not transfer the problem to the project manager. The foreman's direct relations are shown in diagram 9.

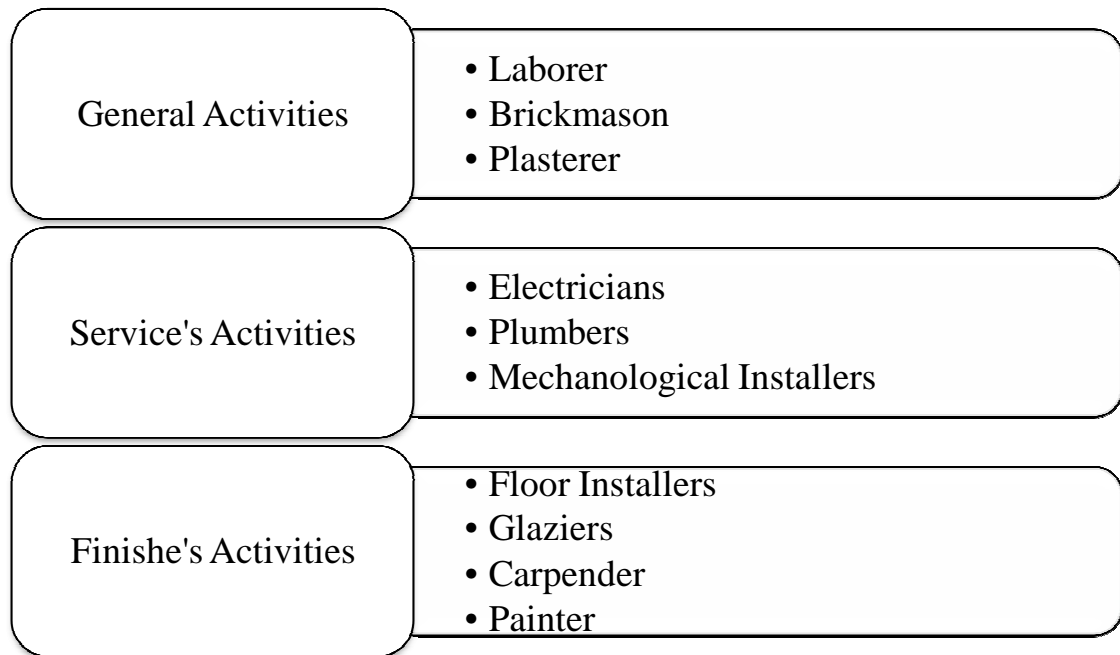


**Diagram 9 Foreman's Direct Relations**

### 3.2.6 Workforce:

Workforce can be characterized as the soul of the construction industry. They have to perform a hard work which in most of the times is outdoor activities which must be performed by hand, exposed on weather conditions with hard working hours and demand good natural condition. The workforce can be divided in many categories and by the development of the technology this number is getting bigger. (Frederick E. Gould and Nancy E. Joyce, 2009)

The main categories of workforce are shown below.



**Diagram 10 Workforce Participants**

(Frederick E. Gould and Nancy E. Joyce, 2009)

### 3.2.7 Contractors:

Contractor is responsible for all the construction activities from the initiation of the project to its delivery to the owner. Contractor can be part of the design of a project or can be chosen only for the construction phase. (Frederick E. Gould and Nancy E. Joyce, 2009)

At first small specialty contractors had the opportunity of becoming contractors but nowadays more specialized and educated people form this team.

Most of the time, one, to be chosen as a contractor of a specific project must take part of the tendering procedures, be evaluated and if fulfill the requirements to be selected.

### 3.2.8 Specialty Contractors or Subcontractors:

They are specialty firms that can be hired from a contractor or a developer to do a specific work of their specialty. One kind of these firms are mechanical, electrical or even huge equipment hiring firms, which can provide their services following the technology and knowhow. There are also subcontractors who provide simple execution of work using their materials and workforce, like carpenters, plumbers and builders. Specialty contractors were introduced in the construction industry at first due to their specialty and later on the

contractor used them to reduce their construction costs. (Frederick E. Gould and Nancy E. Joyce, 2009)

### **3.3 Supply Chain**

#### **3.3.1 Purchase department of the Company**

The Purchase Department of an Organization/Company, has a continuously information about products and prices of the local market. Its responsibility is to provide to the construction site the appropriate materials and equipment that come to meet the requirements of the project within the agreed budget.

#### **3.3.2 Suppliers:**

Suppliers can be divided into two categories of Material and Equipment suppliers.

#### **3.3.3 Material Suppliers:**

They are responsible to supply the site with appropriate materials that meet the architect's specification and subcontractor's method of assembling them. The materials choice is based on performance, durability and aesthetic appeal of the building. Material suppliers are responsible for manufacture or buy the materials, store them and transport them on site when are needed and with safe. (Frederick E. Gould and Nancy E. Joyce, 2009)

#### **3.3.4 Equipment Suppliers:**

Equipments that are going to be supplied at site for a specific project, depends on the project itself. Whether the project is a road or abridge, a building or a skyscraper, the equipments are varying. They can be bought or be rent from a contractor or a company, depending on their use or whether the demand for this kind of use has a long duration or not. Equipments due to their size are brought to the site the exact date that will be needed so as extra cost of storing and protecting them to be avoided. (Frederick E. Gould and Nancy E. Joyce, 2009)

#### **3.3.5 Local Authorities**

Local Authorities can be categorized as participants of the supply chain. They are involved in a project from its initiation in Conception phase through its completion and delivery. The main Local Authorities are:

- 3.3.5.1 **Department of Archaeology:** Before the purchase of the field information must be taken, from the department of archaeology, about the existence or not of archaeological protection.
- 3.3.5.2 **Town planning and Housing Department:** Indicative drawings are approved from the Town planning department, and the Town Planning Permit is issued which indicate the initiation of the procedures of preconstruction phase.
- 3.3.5.3 **Municipality:** The final approval for the beginning of a construction is obtained from the municipality where all the documents and specifications are studied and approved.
- 3.3.5.4 **Water Supply Department:** Is the relevant department with the responsibility of the supply of the project with water after the application form edited from the contractor and the completion of the project.
- 3.3.5.5 **Electricity Authority:** The electricity supply is under the jurisdiction of Electrical Authority and is connected after the application form from the contractor and the relevant check of electrical installations that have been done in relation with the Electrical drawings.
- 3.3.5.6 **Telecommunications Department:** Is responsible for the authorization of telecommunication installations of a project.
- 3.3.5.7 **Fire Department:** The communal areas are under the jurisdiction of the Fire department and it is responsible to indicate the rules which must be satisfied by the completion of the project.

## **4 Human Factors**

### **4.1 Personality:**

Personality is a person's characteristic pattern of thinking, feeling and acting. (David G. Mayers in his book Psychology) It also refers to the special blend of talents, values, hopes, loves, hates and habits that makes each one a unique person. (Dennis Coon and John O. Mitterer, in Psychology a journey) Personality of individuals can be divided into Introvert and Extraverts people.

#### **4.1.1 Extraverts People:**

The typical outgoing, sociable, energetic, confident, talkative and enthusiastic people are characterized as Extraverts. This category of people doesn't have any problems in making conversations and communicating with others. (Icek Ajzen, Attitudes, Personality and Behavior, 2<sup>nd</sup> edition)

#### **4.1.2 Introverts People:**

The more shy, timid, reserved, quiet, distant and retiring people are called Introverts people. These people are becoming relatively awkward or ill at ease when dealing with a social situation and they are not good in making conversations. (Icek Ajzen, Attitudes, Personality and Behavior, 2<sup>nd</sup> edition) Some of the characteristics of Extraverts and Introverts People are shown below:

**Table 2 Characteristics of Extraverts and Introverts People**

<b>Extraverts</b>	<b>Introverts</b>
Define themselves in terms of externals things that other will recognize and respond to	Consider their own view – point the arbiter of reality and define externals in terms of it
Are stimulated by the claims, pleasures and obligations of the outer world – the people, things and events that are constitute external reality	Are more aware of purely mental phenomena – the impressions, facts, ideas and reactions that constitute an inner world
Act before reflecting	Reflect before acting
Are influenced by and gauge their worth by the expectations and attention of others	May defend themselves against the expectations and attentions of others
Are straight forward, understandable and accessible	Are reserved, complicated and private
Are outgoing, sometimes highly expressive, but may not recognize their own needs	Are self-aware, sometimes passionately intense, but may not realize their effect on others

(Lenore Thomson, Personality Type, An Owner's Manual, 1998)

#### **4.1.3 Five Factor Model of Personality**

In the last years of the research in organizational behavior and human resources the Five Factor Model of Personality was suggested, which focuses on the five basic factors of personality that play a significant role to individual's personality in the work place. The promoters of this model (Costa and McCrae 1987, 1992) describe the following five factors (Μαρία Βακόλα και Ιωάννης Νικολάου, Οργανωσιακή Ψυχολογία και Συμπεριφορά, 2012. Rosili)

##### **4.1.3.1 Conscientiousness:**

In this category, the conscientiousness, ambition, responsibility and individual's organization are evaluated. This type of people is characterized by self control, discipline and trust for their selves.

##### **4.1.3.2 Agreeableness:**

This factor response in quality of the social relationships that people want to have, evaluate the interest of individuals for their fellowman and show sensitivity in human pain and problems. They are characterized with high levels of will to cooperate with their surrounding environment, with modesty and yieldingness.

**4.1.3.3 Neuroticism:**

Characteristics of people like feeling insecure, having phobias, the existence of stress, feeling sadness and pessimistic are evaluated.

**4.1.3.4 Openness to Experience:**

This factor include the creativity and imagination of people, their desire of getting know new places and live new experiences. Characteristic of this type of people is the independent way of thinking.

**4.1.3.5 Extroversion:**

This factor responses in the quantity of the social relationship that people want to have. This type of people likes to be surrounded by others, is full of enthusiasm and ambition and feels confident.

The Five Factor Model of Personality is a tool of prediction of performance of people under specific circumstances and professionals, in work place. Therefore is a tool of evaluation on behalf of their managers.

Salgado (1997, 1998), Barrick and Mount (1991) suggested that is difficult for a Manager or a company to employ someone whose characteristics are low conscientiousness or who are stressful, insecure and worried.

The Five Factor Model of Personality must be taken into consideration since it can play a significant role in organization behavior and outputs which are critical for the managers and the organizations. (Μαρία Βακόλα και Ιωάννης Νικολάου, Οργανωσιακή Ψυχολογία και Συμπεριφορά, 2012. Rosili) Some dimensions of these factors are shown in the table below.

**Table 3 Five Factor Model of Personality**

<b>Trait Dimension</b>	<b>End Points of the Dimension</b>	
	Organized	Disorganized
	Careful	Careless
<b>Conscientiousness</b>	Disciplined	Impulsive
	Hard Working	Lazy
	Punctual	Late
	Soft Hearted	Ruthless
	Trusting	Suspicious
<b>Agreeableness</b>	Helpful	Uncooperative
	Lenient	Critical
	Good Natured	Irritable
	Calm	Anxious / worried
<b>Neuroticism</b>	Secure	Insecure
(emotional stability vs instability)	Self-satisfied	Self-pitying
	Comfortable	Self-conscious
	Emotional	Unemotional
	Imaginative Preference	Practical
	Independent	Conforming
<b>Openness</b>	For variety	Preference for routine
	Creative	Uncreative
	Original	Conventional
	Quiet	Talkative
<b>Extroversion</b>	Sociable	Retiring
	Fun loving	Sober
	Affectionate	Reserved

(Trait descriptions adapted from McCrae and Costa, 2001)

## 4.2 Human Behavior

Sigmund Freud stated that the internal dynamics of mind are causally responsible for overt patterns of Behavior. In contrary B.F. Skinner suggested that the person is passive victim of events in the environment. Today Psychologists acknowledge that it is necessary to consider both external and internal determinants of human action. (Lawrence A. Pervin and Daniel Cervone, Personality, Theory and Research, 2010. 11<sup>th</sup> edition)

### 4.2.1 Internal Determinants of Human Behavior

**Table 4 Internal Determinants of Human Behavior**

<b>Internal Determinants of Human Behavior</b>			
<b>Attitudes</b>	<b>Attributes</b>	<b>Skills</b>	<b>Social Endowments</b>
Hard working	Clear goals	Leadership skills	Affectionate family upbringing
Responsible	Clear thoughts	Management skills	High mental abilities in family
Ambitious	Disciplined	Organization skills	Supportive social environment
Devoted	Educated	Planning skills	Prosperity in surrounding society
Trusting	Improves self	Teamwork skills	Psychological health
Honest	Knowledgeable	Technical work skills	Well being
Goodwill	Creative	Problem solving skills	
Reliable	Conscious	Time management skill	
Self confident	Dynamic	Communication skills	
Enthusiastic	Intelligent	Motivating skills	
Courageous	Leads others	Negotiating skills	
Generous	Organized	Public speaking skills	
Sensitive	Well behaved	Listening / writing	

(Gerald Matthews, Ian J. Deary and Martha C. Whiteman, Personality Traits, 2003)

### 4.2.2 External Determinants of Human Behavior

Human behavior can be influenced from external factors like Culture, Social class and Family.

**Culture:** An individual's personality is influenced by the experiences he/she had as a member of particular culture. Learned behaviors, rituals and beliefs are some characteristics that were promoted by each culture to its members in different way. Each culture can define someone needs and means to satisfy them, the relationships with the others, the way of thinking and acting based on location, language, religion, education and age of its members. (Lawrence A. Pervin and Daniel Cervone, Personality, Theory and Research, 2010. 11<sup>th</sup> edition)

**Social Class:** Some characteristics of personality and human's behavior can be obtained by a membership in a specific social class, whether he belongs in a low, upper class, working and professionals or by what privileges he enjoys. A social class can be responsible for the way of someone is thinking and responding in each case. (Lawrence A. Pervin and Daniel Cervone, *Personality, Theory and Research*, 2010. 11<sup>th</sup> edition)

**Family:** One of the most important determinants in development of the personality is the influence of family. From the younger years, someone will receive warm and love or hostile and rejection. These may affect someone to the way of thinking and the way which will behave to others. The communication and corporation in the family will lead to an adult with respect to his obligations and on the other hand the non existence of the communication and corporation will lead to an irresponsible person. (Lawrence A. Pervin and Daniel Cervone, *Personality, Theory and Research*, 2010. 11<sup>th</sup> edition)

**Stress:** A situation that a person could be found, when the pressure that is applied on him either from the work environment, his family or personal life, overcomes his abilities to deal them, is called stress. (Arnold, Silvester, Cooper and Robertston, 2005) Stress, sometimes can be helpful for a person in the increase of his performance and others may lead to psychological consequences. (Cooper, 1984)

**Table 5 Factors of Stress**

<b>Factors that can cause Stress</b>
• The increased responsibilities
• The increased decision making
• Hard working activities
• Unhealthy working conditions and environment
• Non organized working environment

(Greenberg and Baron, 2008)

### **4.3 Theories of Motivation**

It is obvious from the above that by the passing of the time and the technological evolution which was created, the last century, in the construction industry, and even more with the development of modern and complicated structures, the roles of the project teams are even more significant in relation with the outcome the companies and organizations target.

Many managers tried at times to find a formula for these Project teams, for better results in the topics of Cost, Quality and Time related, and even to understand the workers behavior and motivation to their work and how these influenced their productivity and therefore the general output of the organization they were part of, without creating a general rule for these issues.

#### **4.3.1 Frederick W. Taylor Theory (1856 - 1917):**

Frederick W. Taylor was an inventor and engineer, who is considered the Father of Scientific Management.

Frederick Taylor first attempt was to change the output of the workers, by increasing their productivity. To do so, firstly he observed workers on how they work in specific task, which tools they were using, their movements and techniques and even if their methodology was appropriate to the task.

In 1880's observed workers excavating coal with shovels, using their own methodology and then indicated them the appropriate shovel to use, and specific movements to avoid. The outcome was an increase of productivity of the excavated coal, the workers were working more time and continuously and their number decreased by 2/3.

Later on he broke some activities into smaller tasks and left them working with timekeeping them. When they finished he indicated them how the procedure must go on and what tools to be used. The result was a faster production.

Also Taylor though that worker was motivated by money and by following his experiments, stated that workers must be paid according to if they completed their task.

The general conclusion of Frederick Taylor was that to have better results in production and more efficiency in a project team, the workers must be specialized, have skills and abilities and trained in any task that will execute, in combination with the supervision and quality control of their managers, but also be rewarded if their target was achieved.

#### 4.3.2 Herzberg's Theory (1923-2000):

Herzberg was a psychologist who had an experience as a soldier in World War II, which helped him study human motivation.

In contrary to Taylor's theory Herzberg believed that the motivations for the workers weren't only incentive motivations but many other factors could influence their behavior like working hours and working conditions. Also he considered that factors like responsibility, achievement or a challenging work environment could make workers satisfied even if they weren't type of motivation. His research was about motivation in work environment and the factors that influenced such motivation. He found out that there are factors that causing satisfaction to the workers and others causing dissatisfaction. He named the satisfaction's factor motivators and the dissatisfaction's factors hygiene, meaning that with the absence of such factors the workers feel dissatisfaction but by their present doesn't mean that they provide satisfaction.

**Table 6 Herzberg's Theory, Motivators and Hygiene**

Motivators	Hygiene
• Achievement	• Organization's policy
• Recognition	• Supervision
• Interest	• Working conditions
• Responsibility	• Salary
• Growth	• Status

Herzberg concluded that the productivity of the workers can be increased through his satisfaction and therefore companies must avoid factors that dissatisfy the employees and promote intrinsic motivations to keep them satisfied, and stated:

- Workers who are successful should be given more responsibilities
- Job should be challenging enough so as the workers to put all their effort and use 100% of their ability.

#### 4.3.3 Henri Fayol Theory (1841-1925):

Henri Fayol was a French mining engineer and director of mines and one of the first theorists to define Functions of Management and identified the 14 General Principles of Management.

**Table 7 Henri Fayol's theory of Five Functions of Management (1916)**

Functions of Management	Managers of the company must do
<b>1. Planning</b>	<ul style="list-style-type: none"> <li>• Plan for future conditions</li> <li>• Develop strategic objectives</li> <li>• Secure the goals achievement</li> </ul>
<b>2. Organizing</b>	<ul style="list-style-type: none"> <li>• Organize the workforce in an efficient manner</li> <li>• Structure and align the company's activities</li> <li>• Train and recruit the right people for the job</li> </ul>
<b>3. Commanding</b>	<ul style="list-style-type: none"> <li>• Supervise subordinates in their daily work</li> <li>• Inspire them to achieve company's goals</li> <li>• Communicate company's policies to subordinates</li> </ul>
<b>4. Coordinating</b>	<ul style="list-style-type: none"> <li>• Harmonize the procedures and activities performed by the company</li> </ul>
<b>5. Controlling</b>	<ul style="list-style-type: none"> <li>• Control that company's activities are in line with general company's policies and objectives</li> <li>• Observe and report deviations from plans and objectives</li> <li>• Correct the potential deviations</li> </ul>

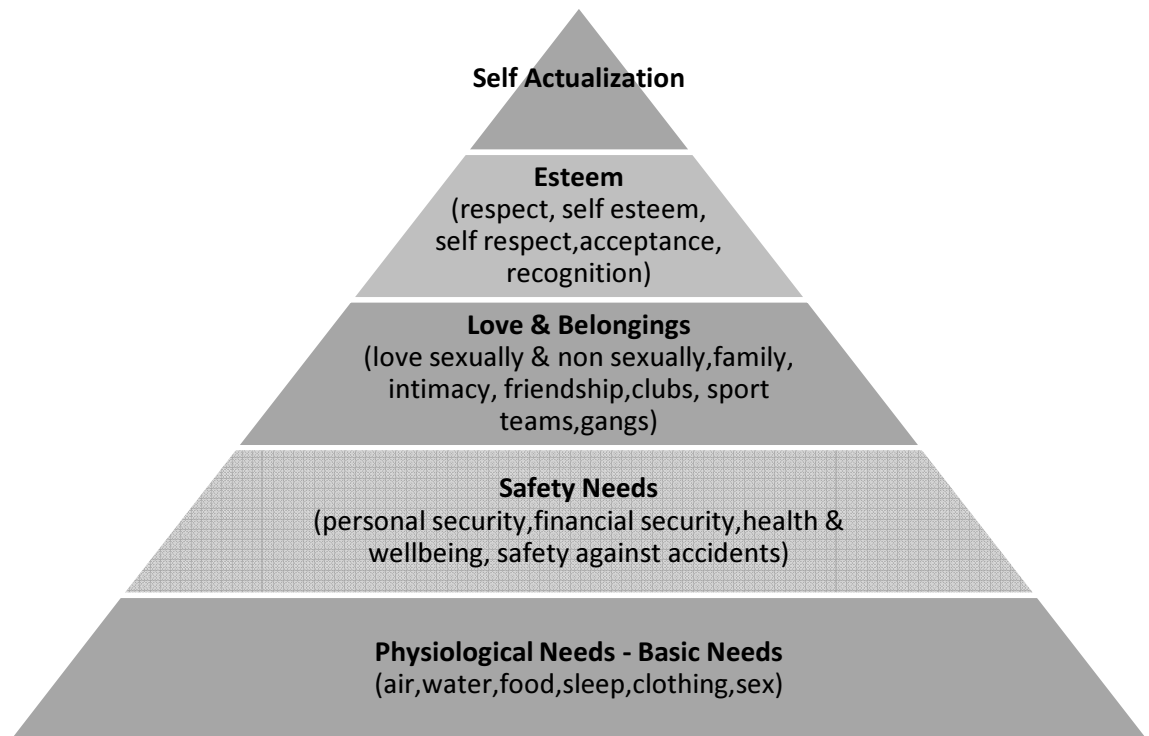
#### 14 General Principles of Management

- **Division and specialization of work:** The existence of specialized people and groups for specific tasks and the division of the work that must be executed among these people will produce a better efficiency and high quality in the company's productivity and product.
- **Authority:** Based on the position that someone has in the organization's pyramid must be able to give orders to his subordinates always accordingly to the responsibilities that takes.
- **Discipline:** Is needed for more effective outcome of any group and therefore employees must obey and respect the rules that govern the organization.

- **Unity of command:** Employees must receive orders and give report only from one superior.
- **Unity of direction:** Each activity performed by the organization must have one manager for giving orders, which satisfy the strategic plan of organization.
- **Subordination of individual interest:** The interest of each employee must not overcome or oppose the interest of the organization.
- **Remuneration policy:** Each employee must be paid a fair payment for his effort and many variables must be considered to determine the payment rate.
- **Centralization:** The general directions of the company must come from the top management and the transfer of these directions to the employees depends on the type of the organization's structure, if centralization or decentralization.
- **Scalar chain of command:** Commands must follow a scalar chain from the top manager to the last level employee in one way direction and the communication between the members must follow a two way direction meaning that employees must communicate and inform their superiors and vice versa if a change of command or problem solving situation exists.
- **Order:** For the good and benefit of an organization order must be predominated on all construction sites and the internal environment of the organization. Workforce and materials must be placed and remained in a specific place for a specific task as long as a new command appears.
- **Equity:** For better effectiveness of the organization and for avoiding any kind of conflicts between the employees, the management must treat the employees with respect and equally regardless their race, nationality or education.
- **Personnel tenure:** Productive employees must be kept in the company and rewarded for their effort, as a result of staying in the company's body and avoid any high cost such as recruitment and selection of new ones.
- **Initiative:** Workers must have the ability to show their initiative to the organization's management which will show personal characteristics as decision taking which will result for the benefit of the organization.
- **Esprit de corps:** A good environment always strengthens the homogeneity and welfare among the groups and that is why organization and companies must encourage the harmony and cohesion between individuals and groups so as to obtain high work moral and motivation.

#### 4.3.4 Abraham Harold Maslow , Hierarchy of Needs (1908-1970):

Abraham Maslow was an American psychologist, who created the Maslow's Hierarchy of Needs, a theory of self actualization. He studied mentally healthy individuals instead of people with psychological issues. He identified human needs and set a hierarchy of them. Analyzing those needs, Maslow stated that for the existence of a right function of the human body and mind, there must be satisfaction of the four bottom layers and to achieve self actualization must master them.



**Diagram 11 Maslow's Hierarchy of Needs**

#### 4.3.5 Douglas McGregor Theory (1906-1964):

Douglas McGregor was an American social psychologist who proposed theories of Human Motivation, known as Theory X and Theory Y.

##### 4.3.5.1 Theory X:

According to McGregor in theory X the managers assumes that employees are inherently lazy and dislike work, will avoid work if they can, will show little ambition and will avoid any kind of responsibilities. For this kind of employees a closely supervision and narrow span of control is needed. Theory X managers rely heavily on threats and coercion to gain their employees' compliance and everything must be ended by blaming someone without asking whether it is the system policy that failed or if there is a lack of training and these leads to diseconomies for the organization.

#### **4.3.5.2 Theory Y:**

In theory Y McGregor placed the managers that assumes the employees may be ambitious, self motivated and exercise the self control, they enjoy their mental and physical work duties and they possess the ability of creative problem solving. In contrary with the theory X, managers believe that if the right conditions are given to the employees will want to do well at work and the satisfaction which will be gained will be a strong motivation for them. Also the creation of a trust's climate will drive to better communication between the managers and their subordinates with result the development of a comfortable environment in which the subordinates will develop and use their abilities, which in the end the organization will get economic benefits.

#### **4.3.6 Theory Z:**

Theory Z was developed by William Ouchi on his book "How American management can meet the Japanese challenge" and is a combination of the best of the McGregor theory and the modern Japanese management. Is a form of management that workers are involved in the work process on site and many activities are done by the workers the way they see best. It also places more reliance on the attitude and responsibilities of the workers and tend to promote stable employment, high productivity, high employee morale and satisfaction.

#### **4.3.7 William Edward Deming (1900-1993):**

W. Edward Deming was an American statistician, professor, author and consultant whose work was established in Japan and America. He is known also for his theory about the 14 points for management, which was followed by many companies and organizations and drive them to success.

#### **4.3.8 W. Edward Deming's 14 Principles of Management:**

1. **Constancy of Purpose:** There must be a constancy of purpose for an improvement of the products and services, and to provide a long term needs with the target of being competitive and stay in business instead of short term profitability.
2. **The New Philosophy:** A new philosophy must be adopted in a new age of economy and technology, avoiding the mistakes of the past such as delays and defective materials and quality of work.
3. **Cease dependence on mass inspection:** The mass inspection must stop so as to be able to control the quality and productivity, minimizing by this the total costs.
4. **End lowest tender contractors:** All the suppliers who don't qualify for the quality of their product to be turned down, and the company to focus on the quality and not

to the price. This can be obtained by creating relationship based on loyalty and trust with only one supplier for a specific task.

5. **Improve every process:** A continuous improvement on all procedures must exist. The correction of mistakes in each activity is necessary for the improvement of the quality and productivity of the whole company. There must be a full time contribution of the manager in all the phases, including the supervision and training of the employees.
6. **Institute training on the job:** Introduce new methods of training the employees and managers so as to create new skills and techniques which will drive to the improvement of quality, productivity, money saving and time for delivery.
7. **Institute leadership:** Adopt new methods of leadership which will help the employees to produce better.
8. **Drive out fear:** The introduction of a two way communication between the company and employees will help to drive out their fear with a result the increase of their productivity.
9. **Break down barriers:** Any difficulties in communication or conflicts are existed in the company's environment must be solved so as people in different departments to be able to work as a team for the benefit of the company.
10. **Eliminate Exhortations:** Slogans, posters or any kind of exhortations that tend to motivate employees must be eliminated and methods for increase of their productivity must be provided.
11. **Eliminate arbitrary numerical targets:** The standards of work and numerical targets must be eliminated and a helpful leadership must be introduced for improvement of quality and productivity.
12. **Permit pride of workmanship:** Remove the barriers that rob hourly workers and people in management, of their right to pride of workmanship.
13. **Encourage education:** Programs with educational purpose must be applied for employees and managers so as to result in self improvement and education.
14. **Top management commitment and action:** Managers must not only monitor the procedures but also be a part of them, find and solve problems, in all phases and activities and try to follow the 13 principles above for a more productive and economic output.

#### **4.3.9 Kaizen Philosophy:**

In Japanese means Kai (change) + zen (to become better). Is a philosophy which refers to a continuous improvement and has been applied in engineering, health care, government, banking and other industries. Kaizen philosophy is based on 5 founding elements:

- Team working
- Personal discipline
- Improve morale
- Quality circles
- Suggestions for improvement

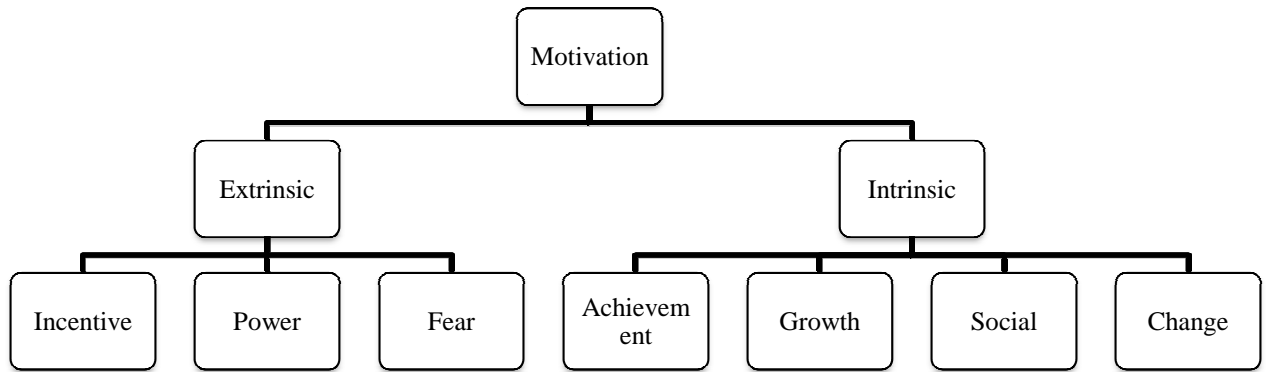
The application of Kaizen philosophy is based on the members of a company and their collaboration. It encourages the team working, communication, brainstorming sessions, support to each other with result the creation of a happy environment and the decreased costs of the company.

#### **4.4 Types of Motivation**

One's need, feeling, desire or even a thought that encourage him or the team that he is a part of to rich his goals and enforce the team's effort in obtaining its aims, are characterized as Motivations. Motivation can be given to anybody who needs it, but cannot be given to everybody in the same way. People have different characteristics and needs and in many cases the situations are different so the motivation approaches are varied. They can be divided in Intrinsic and Extrinsic Motivations.

Intrinsic Motivation is the one that comes from the inside needs and characteristics of an individual, such his personality and ego or his willing and desire for doing something.

Extrinsic Motivation on the other hand is based on the external factors that influence someone like money, awards or even fear.



**Diagram 12 Types of Motivation**

#### **4.4.1 Incentive Motivation:**

Is the type of motivation that involves rewards as an exchange for the productivity and corporation of an employee with the company. It is recognized that the idea of a promotion or a bonus for obtaining higher level of productivity can motivate the employees for better results. Even in a period of Economical crisis, to maintain his position in the company can be an incentive motivation.

Frederick W. Taylor, after his experiments and observation on workers, stated that the workers increase their productivity if they get paid satisfactory.

#### **4.4.2 Fear Motivation:**

Punishment or negative consequences are a form of Fear Motivation. Douglas McGregor, in his Theory X, expressed the opinion that the workers must be closely supervised and controlled and must feel fear against their managers. Therefore managers can obtain better results according to the productivity of the workers.

Fear of losing their jobs is something that surrounds everybody these days. Salaries are getting less and the working hours are changing. Construction Industry faces the crisis and with it a lot of people started to fear the possibility of staying unemployment.

#### **4.4.3 Achievement Motivation:**

A desire or a need of the employees to receive positive feedback or recognition from their colleagues and superiors, the improvement of their skills and the proof of their competency, are characteristics of the Achievement Motivation.

Douglas McGregor in his theory Y, produced the improvement of the working conditions by creating the trust and by the use of the ability of the employees.

William Ouchi in his Theory Z, produced the Achievement motivation, by the involvement of the workers in the work process and in decision making, with the result of a more homogeneous project teams.

Herzberg stated that factors like achievement would make the workers satisfied, and that satisfaction could obtain better results.

#### **4.4.4 Power Motivation:**

Another type of Extrinsic Motivation is the Power Motivation. Is the desire person has, for autonomy and to control others. A control which might drive people to harmful, immoral or illegal behavior. People want others to do what they want, how they want and what they want by induce fear which is a privilege that they gain from their position in the hierarchy structure of the company. Such motivation is described in the theory X of Douglas McGregor.

#### **4.4.5 Growth Motivation:**

Is an intrinsic motivation based on someone's personality. The desire that someone has for self improvement and increased knowledge without obtaining any awards.

One of the satisfaction's factor that Herzberg defined as motivator was the Growth Motivation. He stated that activities in any task should be challenging enough so the workers to put all their effort and use their ability to obtain their goals.

#### **4.4.6 Social Motivation:**

Many people are motivated by social factors. Their desire on belonging somewhere and to be accepted by others or the contribution to make a difference comes from their internal. An Intrinsic Motivation which produced by Herzberg's theory and Keizen Philosophy that satisfaction, happy environment, brainstorming sessions and communication can make workers increase their productivity.

#### **4.4.7 Change Motivation:**

Another Intrinsic Motivation which comes from the personality of people, where there is the desire of doing something different which will produce a change in a positive way. The corporation, the selection of new ideas and the communication of the member of a team which could drive a company to change strategy for its benefit, were the change motivations that were stated in Keizen Philosophy.



## **5 Field research and Results**

### **5.1 Methodology**

This part of the dissertation describes the method that was followed to obtain the aims and objectives of the dissertation, by the use of Qualitative and Quantitative research method and the collection of Primary data information.

Analyze of factors that affecting the employees behavior in Construction Project in relation to improved performance.

The questionnaire was form in such a way that the respondents to focus their answers in:

1. Evaluation of employees' satisfaction based on their relationship with their superiors, colleagues and subordinates in manner of corporation and communication but also in the general environment of the company they are part of.
2. Critical examination of the Superiors'/Managers' attitude towards employees, the level of organizing and the effectiveness in giving orders.
3. Evaluation of employees' productivity and the allowances of improvement
4. Examination of the existence of motivation on behalf of the company that drives the employees in higher level of productivity and the type of motivation that the employees are suggested for such improvement

### **5.2 'Qualitative and Quantitative' Research Method**

Qualitative field research was used on exploring the attitudes of the employees and their behavior under specific conditions such as stress, their satisfaction based on the company's environment and their relationships with other employees, the levels of their productivity based on their evaluation and how these levels could be improved.

Quantitative field research was based on the collection of specific data from the responses of the sample which would form a structure for statistical analysis. The sample of respondents was consisted of forty five members of several project teams.

Questionnaire: The respondents received a questionnaire either by e mail or by hand. It consisted of fifty questions which were target the objectives of the dissertation.

Respondents: The respondents were employees of medium construction companies and developers, small contractors and employees of the public sector, of the four big cities of

Cyprus (Nicosia, Limassol, Larnaca and Paphos). The respondents were forty five employees and Managers and were composed of:

1. Manager of a company No 3
2. Project Managers No 6
3. Architects ( independent and members of companies) No 4
4. Site Engineers ( employees of private and public sector) No 18
5. Foremen No 9
6. Man force No 5

### 5.3 Field Research Results:

The results of the field research were analyzed and presented in Charts and Likert Scales, followed by conclusions and comments.

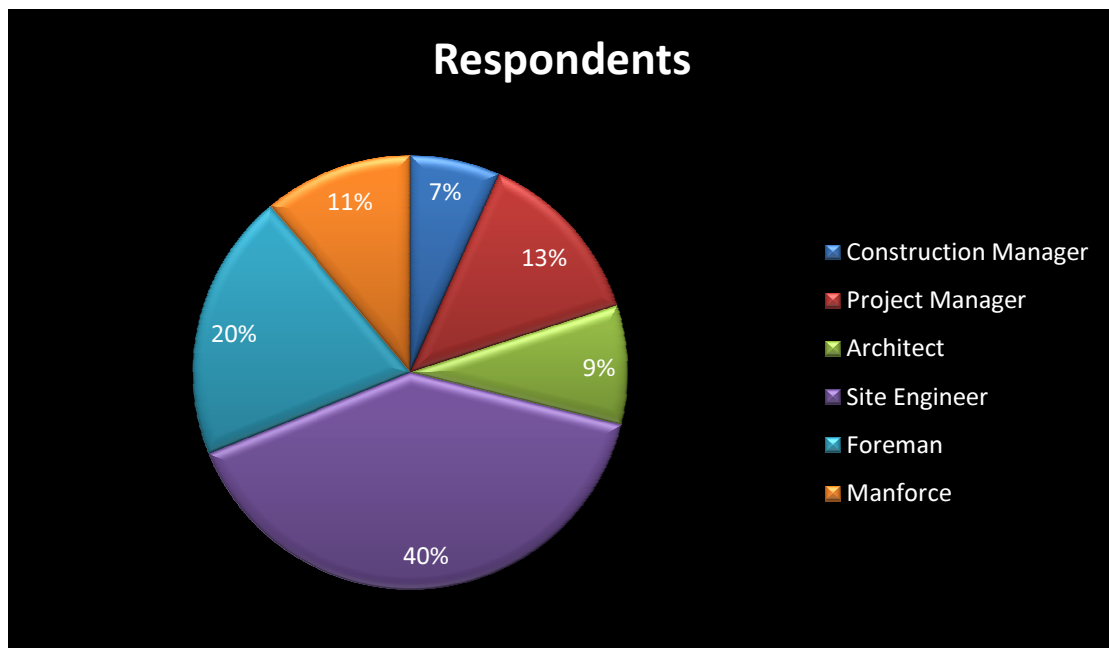


Chart No 1

In Chart No 1 are shown the percentages of each project team that was taken part as respondents of the questionnaire for the purpose of the dissertation. They were members of small construction companies to medium developers companies. The sample was consisted of:

1. Manager of a company No 3 which is the 7% of the respondents
2. Project Managers No 6 which is the 13% of the respondents
3. Architects ( independent and members of companies) No 4 which is the 9% of the respondents
4. Site Engineers ( employees of private and public sector) No 18 which is the 40% of the respondents
5. Foremen No 9 which is the 20% of the respondents
6. Man force No 5 which is the 11% of the respondents

**Likert Scale No 1: Age of Respondents**

Age		20-30	31-40	41-50	51-60	61-65	Likert Scale				
Scale		1	2	3	4	5					
Respondents	45	12	21	8	4	0	1	2	3	4	5
Adjustment	94	12	42	24	16	0	← [Red Dot] →				
Mean Value	2,09						Mean Value [Red Dot] 2,09				

The mean value of the likert scale No 1 indicated that the average age of the respondents is approximately up to forty years old. Therefore the sample which had been chosen for the purpose of the dissertation was young people.

**Likert Scale No 2: Years of Experience of the Respondents**

Years		0-2	2-5	5-10	10-15	More	Likert Scale				
Scale		1	2	3	4	5					
Respondents	45	11	16	14	3	1	1	2	3	4	5
Adjustment	102	11	32	42	12	5	← [Red Dot] →				
Mean Value	2,27						Mean Value [Red Dot] 2,27				

The sample asked for previous experience and their responses were analyzed with a mean value at 2,27. This shown that the respondents had average previous experience from 5 to 10 years.

From likert scales No 1 and No 2 was concluded that the respondents were most of them young people with few years of experience and new entrants in the Construction Industry who are just starting structuring their personal and professional lives.

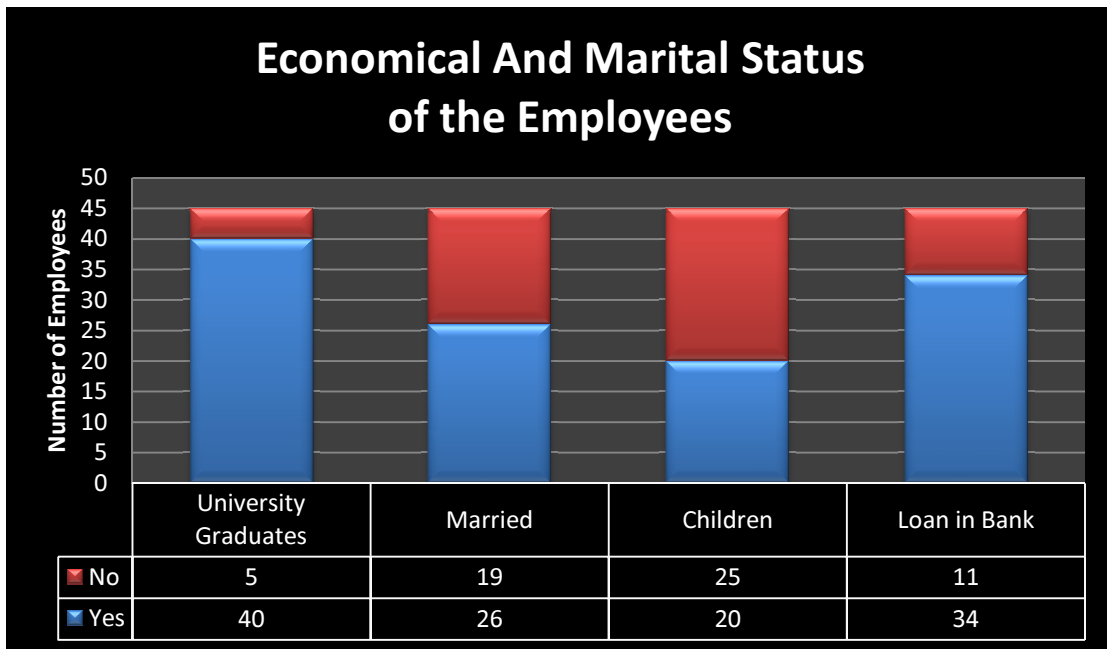


Chart No 2

In Chart No 2, are shown the Economical and Marital Status of each respondent and the level of education they had.


From the responses is concluded that the sample were most of them young people up to forties with few years of experience and a percentage of 88% were educated people.

A percentage of 58% was married and a 44% of them had children, which means more social and family responsibilities and the 76% of them economic obligations since they had loan to the bank.

Question 1) What is the grade of corporation with your superiors?


Responses		Little	Enough	A Lot	Likert Scale		
Scale		1	2	3			
Respondents	42	7	22	13	1	2	3
Adjustment	90	7	44	39			
Mean Value	2,14				Mean Value		2,14

Question 2) Are there any allowances of improvement in corporation with your superiors?


Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	43	38	2	3	1	2	3
Adjustment	51	38	4	9			
Mean Value	1,19				Mean Value		1,19

**Comments on Question 1 and Question 2:** The analysis of the results on the questions 1 and 2, shown that the corporation between the employees and their superiors are between 'Enough' and 'A lot' levels, although some of the respondents answered that their corporation is 'Little'. Even though there is an 88% (38/43) opinion of the respondents that there are allowances of improvement of this corporation.

Question 3) What is the grade of corporation with your colleagues?

Responses		Little	Enough	A Lot	Likert Scale		
Scale		1	2	3			
Respondents	45	0	26	19	1	2	3
Adjustment	109	0	52	57			
Mean Value	2,42				Mean Value		2,42

Question 4) Are there any allowances of improvement in corporation with your colleagues?

Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	44	38	0	6	1	2	3
Adjustment	56	38	0	18			
Mean Value	1,27				Mean Value		1,27

**Comments on Question 3 and Question 4:** Regarding to the corporation between colleagues, the analysis shown 'Enough' to 'A Lot' levels having a mean value of 2,42. Even though there wasn't a response for 'Little' corporation, the (38/44) 86% of the respondents agreed that there are allowances for improvement of the corporation with their colleagues.

Question 5) Is there any communication with your colleagues?

Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	45	38	5	2	1	2	3
Adjustment	54	38	10	6			
Mean Value	1,20				Mean Value 1,20		

Question 6) Are there any allowances of improvement in communication with your colleagues?

Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	45	37	0	8	1	2	3
Adjustment	61	37	0	24			
Mean Value	1,36				Mean Value 1,36		

**Comments on Question 5 and Question 6:** The 1,20 mean value on the Likert scale shown the existence of a very good communication between colleagues. Although there were good results, again the respondents suggested that there are allowances for improvement of the communication between their colleagues.

Question 7) Is there any communication with your subordinates?


Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	42	34	2	6	1	2	3
Adjustment	56	34	4	18			
Mean Value	1,33				Mean Value 1,33		

Question 8) Are there any allowances of improvement in communication with your subordinates?


Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	42	32	2	8	1	2	3
Adjustment	60	32	4	24			
Mean Value	1,43				Mean Value 1,43		

**Comments on Question 7 and Question 8:** The analysis of the results on the questions 1 and 2 shown a satisfactory communication with subordinate at levels of mean value at 1,33. The suggestion for improvement of this communication is not at the same level due to the fact that the sample of the respondents is not uniformly distributed at all the levels of project team's hierarchy.

Question 9) Do you consider your superiors organizing, satisfactory?


Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	44	17	2	25	1	2	3
Adjustment	96	17	4	75			
Mean Value	2,18				Mean Value		2,18

Question 10) Are there any allowances on improvement of your superiors organize?


Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	43	34	0	9	1	2	3
Adjustment	61	34	0	27			
Mean Value	1,42				Mean Value		1,42

**Comments on Question 9 and Question 10:** The analysis of the responses of question 9 and 10 is very important since the organizing on behalf of the superiors plays a significant role in the procedures of constructing a project from the beginning to the end. The responses shown that the employees are not satisfied with their superiors organizing with a mean value of 2,18 and the 79%(34/43) of the respondents suggested that there are allowances for improvement.

Question 11) Do you consider your colleagues organizing, satisfactory?

Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	45	20	3	22	1	2	3
Adjustment	92	20	6	66			
Mean Value	2,04				Mean Value		2,04

Question 12) Are there any allowances on improvement of your colleagues organizing?


Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	44	38	0	6	1	2	3
Adjustment	56	38	0	18			
Mean Value	1,27				Mean Value 1,27		

**Comments on Question 11 and Question 12:** Even if the analysis of the previous questions shown that the corporation's and communication's levels between colleagues were at good levels, the mean value of 2,04 shown that the respondents considerations about their colleagues organizing are not satisfactory. For this a percentage of 86 % (38/44) suggested that there are allowances for improvement of their colleagues organizing.

Question 13) With scale 1 to 10, which grade is your productivity?

Responses		0-5	6-7	8-9	10	Likert Scale			
Scale		1	2	3	4				
Respondents	45	0	13	28	4	1	2	3	4
Adjustment	126	0	26	84	16				
Mean Value	2,80					Mean Value 2,80			

Question 14) Are there any allowances on improvement of your productivity?

Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	45	37	2	6	1	2	3
Adjustment	59	37	4	18			
Mean Value	1,31				Mean Value 1,31		

**Comments on Question 13 and Question 14:** The evaluation of the employees' productivity obtained from the responses can be characterized satisfactory since the mean value on the likert scale was 2.80 close to an evaluation of 8-9 in the scale to 10. Even though the evaluation was at high levels, the respondents suggested that there are allowances for improvement of their productivity with the mean value at 1.31

Question 15) Is there any motivation on behalf of the company for improvement of your productivity?

Responses		Yes	Other	No	Likert Scale		
Scale		1	2	3			
Respondents	45	12	1	32	1	2	3
Adjustment	110	12	2	96	←—————●————→		
Mean Value	2,44				Mean Value		2,44

**Comments on Question 15:** Is shown from the two previous evaluations (13, 14) that the respondents care about their productivity and they want an improvement even in higher levels, but they appreciated by mean value of 2,44 that there is no motivation on behalf of their companies for improvement of their productivity.

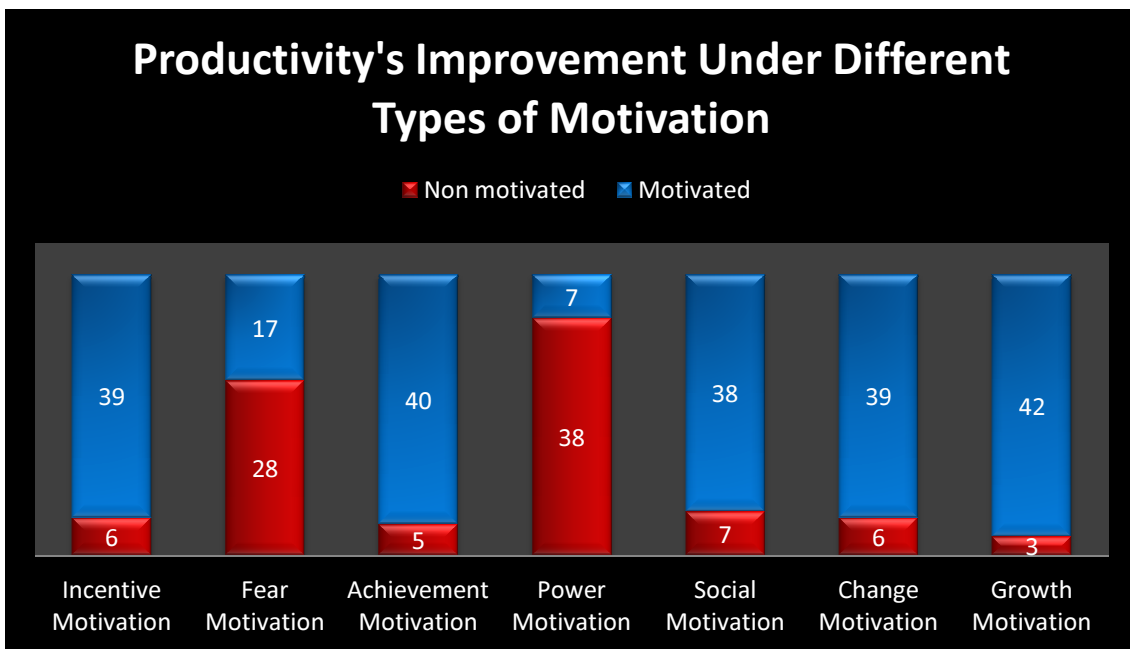


Chart No 3

In Chart No 3 are indicated the types of motivation that would influence the employees to improve their productivity. Is clearly shown that, the employees voted in favor for Incentive, Achievement, Social, Change and Growth motivation and they reject the Fear and Power motivation. Is shown from the evaluation above that the age of the use of fear and power was replaced with personal desire in development of skills, knowledge and the feeling of contribution.

## **6 Conclusions:**

**Evaluation of employees' satisfaction based on their relationship with their superiors, colleagues and subordinates in manner of corporation and communication but also in the general environment of the company they are part of.**

It was indicated from the field research, that employees' satisfaction must be produced by the creation of a happy environment, by promoting team working, brainstorming and sessions on behalf of the company.

A challenging environment and the responsibilities given to the employees along with the recognition of the employees from superiors for the successful completion of their tasks would lead them into satisfaction.

Also it was suggested that the present of satisfaction by obtaining human needs as basic needs, safety needs, love and belonging needs and esteem needs would create the right functions for the body and mind of an employee.

The satisfaction levels of the employees in manner of corporation and communication with their superiors, colleagues and subordinates taken out from the field research were at good levels\* and even though the opinion for allowances for improvement was suggested.

### **Evaluation of employees' productivity and the allowances of improvement**

Desk research shown that, employees' satisfaction is based on themselves and on their managers' supervision. The specialization of the employees would decrease the expenses of the company and produce the high quality of the project in the indicated time. For these to be obtained, the appropriate equipment must be used and the methodology of the procedures must be followed, avoiding the extra costs and useless movements.

On the other hand, a good supervision and control of the employees must be provided by their managers. Any conflicts or wrong procedures must be solved and avoided by the correct monitoring.

Field research concluded that tasks are designated to employees according to their specialization by the use of the appropriate equipments. The evaluation of the employees' control was in satisfied levels but was suggested the allowance of improvement of it.

Also the productivity levels of the employees were evaluated and the mean value on the likert scale was at 2.8, indicated a level of 8-9, in scale to 10, and even though, field research shown that there were allowances for improvement.

**Critical examination of the Superiors'/Managers' attitude towards employees, the level of organizing and the effectiveness in giving orders.**

The performance of the employees is also a manager's responsibility. As stated in the desk research, there are basic functions of Management which must be followed by every manager.

One of these functions is the organizing of the workforce, train them and recruit the right people for a specific work.

Commanding and supervising the employees along with the inspiration of them is another function of management stated in the desk research.

Also there were stated that there are different types of managers. The use of closely supervision and narrow span of control based on threats and coercion, which will force the employees to abeyance and on the other the creation of the right conditions and climate of trust which will drive the employees in better communication and performance.

Field research suggested that strictly behavior, fear motivation and perform under pressure and stress are not something that the employees are looking for, but enforce the opinion of improvement of the relationship among the project teams.

Even if it was considered that the organizing and giving orders on behalf of the superiors were in satisfactory levels there were suggestions for improvement.

**Examination of the existence of motivation on behalf of the company that drives the employees in higher level of productivity and the type of motivation that the employees are suggested for such improvement**

Several types of motivation that can be given to the employees based on their personalities and their tasks were identified in desk research.

It was shown that money can make the employees to work more and commit themselves to what they are doing, which was defined as Incentive motivation, but on the other hand was stated that workers must be rewarded based on if they had achieved their target.

The completion of employees' task and the recognition that was taken from the company was defined as Achievement motivation.

It was also stated that the opportunity that is given to employees for self and skills improvement along with their training could produce a Growth motivation.

The contribution of employees in accomplishing the company's target and their involvement in decision taking formed them as a part of the company producing a Social motivation.

The introduction of new ideas and technologies that are able to give a new direction to the company and would result in profit was defined in desk research as Change motivation.

Also it was concluded that satisfaction of the employees in the work environment would provide them a motivation.

The above types of motivation were defined in field research as the types of motivation that the employees need to improve their productivity. The results below, showed the need of present of such motivation.

- 86,7% (39/45) of the respondents consider that Incentive motivation is needed
- 88,9% (40/45) of them, consider that Achievement motivation can obtain better results if promoted by the company
- 84,4% (38/45) of them needed a Social motivation in the structure of a company
- 86,7% (39/45) of them suggested that a Change motivation is needed, for both company and employees
- And 93,3% (42/45) of the respondents suggested that the Growth motivation must be promoted by the company which will introduce the employees in a different way of thinking and acting moving the company in an innovating strategy.

On the other hand, field research indicated that the restrict attitude and the threats in combination of the existence of stress, are not motivation for the employees and neither the use of power on others due to one's position in the pyramid of hierarchy of a company.

As mentioned in desk research, people differ in personality, the way of thinking, in perceiving things and in their behavior. Many things must be said or given to them in the

simplest form or their language of perception so as to receive the correct message. Their needs must be understood and the appropriate motivation must be given to them.

It was shown that ***“opportunities must be given to employees, for them to create an idea or change something towards improvement, or even contribute in their way to a common goal and feel accepted and recognized”*** by others and this might be the only motivation they seek.

## 7 References

### Books

1. Frederick E. Gould and Nancy E. Joyce. (2009). *Construction Project Management*. Third Edition. USA: Pearson
2. Frank Harris and Ronald McCaffer with Francis Edum-Fotwe. (2006). *Modern Construction Management*. Sixth Edition. Blackwell Publishing
3. Lawrence A. Pervin and Daniel Cervone. (2010). *Personality Theory and Research*. Eleventh Edition. John Wiley & Sons, Inc
4. Nicky Hayes. (2000). *Foundations of Psychology*. Third Edition. Pat Bond
5. Gerald Matthews, Ian J. Deary and Martha C. Witeman. (2003). *Personality Traits*
6. Glassop L.I. (2002). *The Organizational Benefits of Teams*. *Human Relations*
7. Arnold J., Silvester J., Cooper C. and Robertson I. (2005). *Work Psychology: Understanding Human Behavior In The Work Place*. Financial Times
8. Costa A.C., Roe R.A. and Taillien T. (2001). *Trust within Teams: The Relation With Performance Effectiveness*. *European Journal of Work and Organizational Psychology*.
9. Λεωνίδας Σ. Χυτήρης. (2001). *Οργανωσιακή Συμπεριφορά: Η Ανθρώπινη Συμπεριφορά Σε Οργανισμούς και Επιχειρήσεις*. Τρίτη Έκδοση. Αθήνα: Interbooks
10. Μαρία Βακόλα και Ιωάννης Νικολάου. (2012). *Οργανωσιακή Ψυχολογία και Συμπεριφορά*. Rosili

**Web**

- 1 Tim Cornick and James Mather. (2009). *Construction Project Teams, Making Them Work Profitably*. London: Thomas Teleford (on line) Available from: [http://books.google.com.cy/books?hl=en&lr=&id=tYoAHj0uoHEC&oi=fnd&pg=PA1&dq=construction+project+teams&ots=dkBF2kl\\_9c&sig=nz9Im5dQL5osKuAURTcUfC1IN9g&redir\\_esc=y#v=onepage&q=construction%20project%20teams&f=false](http://books.google.com.cy/books?hl=en&lr=&id=tYoAHj0uoHEC&oi=fnd&pg=PA1&dq=construction+project+teams&ots=dkBF2kl_9c&sig=nz9Im5dQL5osKuAURTcUfC1IN9g&redir_esc=y#v=onepage&q=construction%20project%20teams&f=false)
- 2 Small Business. *Herzberg and Taylors Theories of Motivation* (on line) Available from: <http://smallbusiness.chron.com/herzberg-taylors-theories-motivation-704.html>
- 3 Management For the Rest of Us. *Frederick W. Taylor, Scientific Management* (on Line) Available from: <http://www.mftrou.com/frederick-taylor.html>
- 4 Studymode. *Compare and Contrast Management Theories of Frederick Taylor, Henri Fayol, Elton Mayo and Douglas MaGregor*. (on line) Available from: <http://www.oppapers.com/essays/Compare-Contrast-Management-Theories-Frederick-Taylor/148963>
- 5 <http://managementinnovations.wordpress.com/2008/12/04/henri-fayols-14-principles-of-management/>
- 6 Lifehack. *Six Types of Motivation Explained* (on line) Available from: <http://www.lifehack.org/articles/productivity/6-types-of-motivation-explained.html>
- 7 citeHR. *Different Types Of Motivation* (on line) Available from: <http://www.citehr.com/35175-different-types-motivation.html>
- 8 <http://mmrg.pbworks.com/f/Ryan,+Deci+00.pdf>

## **8 Appendices**

### **1. Questionnaire of Field Research**