

Study on Motivational Model for Civil Engineers & Workers in Construction Industry

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Abstract— One of the major concerning issue of constructors and owners of construction are how to improve construction productivity and how construction project can be completed cost effectively. Because of large number of labours and civil engineers involved in construction industry there have been several studies that have focused on how to motivate them, so as to improve construction productivity. It has been seen that increasing construction workers and civil engineers productivity through improved method of motivation will result in considerable saving and in time completion of construction work. In this paper covered all relevant studies which possess and are primarily concerned what energize human behavior and how behavior is maintained or sustained throughout the project.

Key words: Motivation, Motivational Model, Efficiency Improvement, Productivity Enhancement

I. INTRODUCTION

Industry today is facing three needs viz. i) to increase productivity ii) to promote employee satisfaction iii) to curtail industrial conflicts. The achievement of these three objectives is necessary for sound and profitable operation of a business enterprise. Businessman firmly believed that effectiveness of business depended almost entirely upon perfection of its technical process and of equipment employed by it. Economists of nineteenth century regarded labor as commodity like other material factor of production. It is only recently that they have begun to realize that full utilization of its human resources is equally important. According to Peter Ducker "Human being is the central, the rarest, and the most precious capital resources of our industrial society." The human resources alone because of their ability to co-ordinate, to integrate, to judge and to imagine are capable of yielding an output far greater than their input. Other material resources are subject to operation of law of mechanics, in the sense that when combined that can give output which is at the most equal to but often less than their input. Dr. Frank claimed that potential hidden in human resources is as high as in an atom of U232. In this paper it is explored that how can this potential be used for increasing productivity.

II. THEORIES OF MOTIVATION

A. MASLOW

First theory for discussion is of Abraham Maslow who was prominent social psychologist. Maslow mentioned that a person's needs were hierarchical and that they could be classified on five levels. Each need level must be satisfied before the next need level becomes of importance. The needs in ascending order are: physiological, safety, social, egotistic and self-actualization. Physiologically, people must have basics such as food, water, clothing etc. People's needs for

protection against threats are found on safety level. After satisfaction of these two needs social need

B. McGregor

Douglas McGregor's Theory X and Theory Y is the next theory. Theory X describes average human as one who has an inherent dislike for work and must be coerced, controlled, directed and threatened with punishment to achieve the goals of the organization. In addition, Theory X says a person prefers to be directed, wishes to avoid responsibility and has little ambition.

Theory Y describes human behavior as naturally expending physical and mental effort in work, just as in rest or play. Organizational objectives are made without the threat of punishment or excessive external controls, and people will, if given the opportunity, utilize internal direction and self-control in the accomplishment of tasks towards goals to which they are committed. Becoming committed to an objective is related to the rewards associated with achieving that objective. McGregor goes on by saying people are capable of accepting responsibility, and in the right conditions, may aggressively seek obligations. Theory Y is concluded by ascertaining that the ability of people to be imaginative, ingenious, and creative is common, and the intelligence of the average human is only partially utilized in the work place.

C. HERZBERG

This theory was originally developed by interviewing 200 engineers and accountants to gain insight into their working relationships, attitudes and performance motivators. Herzberg defined motivator as behavior concerned with job satisfaction. His description of job constituents which cause dissatisfaction are called Hygiene factors.

D. VROOM & LAUFER

This theory differs from previous three mainly in attention to uniqueness of personal needs, objectives and rewards. The principles of the theory accent the requirement for recognizing three sets of variables and the relationship those variables have to each other within different individual. Expectancy theory says the motivational force of an individual is equal to multiplying the personal expectancies concerning future events by value placed on outcomes.

III. APPLICATION OF THEORIES ON CIVIL ENGINEERS

According to Maslow's theory if a civil engineer has been successful in his career, his physiological and safety needs are satisfied in relation to his fellow men. Motivation of such an engineer would best be accomplished by giving attention to his social, egotistic and self-actualization requirement.

Motivating civil engineer under Theory X plan would be primarily through extrinsic motivators that are

incentives that only influence our feelings towards working for a particular company, rather than increasing the satisfaction of work itself within that company. Theory Y can be used to help engineering managers view the motivational process as one which is dynamic and requires constant integration of organizational and employee goals.

Considering Herzberg's theory, intrinsic motivators are applicable to civil engineers who generally have technical and intellectual skills to control the quantity and quality of work productivity, because the scope of work is generally centered on mental instead of physical, machine controlled activities. Job assignments can be non-repetitious, intellectually stimulating projects which will provide engineers with feeling of growth and achievement. Company policies, supervisors and working relationships are commonly viewed as restrictions to steps an engineer takes towards accomplishment of objectives.

The Expectancy theory differs from other theories by emphasizing the worth of evaluating the behavioral motivators of each engineer. The major problem with the expectancy theory is its relative complexity in terms of implementation. It not only requires an engineering manager to identify an individual wants, but the manager must also be able to influence an individual perception of performing a task given a certain degree of effort and how attractive the positive outcome is to that individual. Using this theory exclusively then may not be advantageous to engineering manager who finds the perceived implementation effort to be greater than the expected outcome.

IV. PRACTICAL PROGRAMME TO MOTIVATE EMPLOYEES

Having discussed different theories of motivation, we are now in a position to make positive suggestions in formulating a practical programme for motivating employees. In our country, a large majority of industrial workers are only semi-literate and do not have the benefit of intellectual development which is a result of higher education. Many do not get adequate monetary rewards to satisfy their basic needs. Following are few measures for managements who desire satisfactory employee relations

A system of wage incentive which will ensure adequate income to employees and convince them that the management is sincerely interested in a better living standard for them and not in greater profits for itself alone.

Satisfactory physical conditions of work, such as ventilation, temperature, lighting, noise, etc. which will help to reduce irritation.

Small cohesive work groups and emphatic and understanding supervisors to satisfy their social needs.

V. MOTIVATION IN THE CONSTRUCTION INDUSTRY

All motivation techniques applied successfully in most industries are not necessarily effective in the construction industry. The construction industry is different, and these differences need to be recognized. Notwithstanding these differences the principles discussed in the preceding chapters still apply. The construction manager must understand the limitations that are imposed by the very nature of the industry when attempting to set up a motivation program. Considering the differences, the construction manager must be resourceful

and creative. This chapter explores those factors that are unique to the construction industry and explains their impact upon motivation and performance.

A. Project Employment

In the construction industry the work force works for the project, not the construction company. During the course of the year the construction worker may have worked on several projects, unlike the factory worker who works for a single company, gets an annual report of the company's profit and looks forward to a company pension. The construction worker is a migratory sole who seldom if ever establishes a lasting unity with one construction firm.

B. Union Shop Influences

Unions provide a means by which worker's rights are protected. Unions negotiate for wages, hours, and working conditions. Unions do address some of the very same issues that lead to the satisfaction of worker's needs. While it is true that unions make important contributions to the operation of the construction industry and safeguard employee rights, the unions do impose limits upon the motivation progress that the construction manager may implement.

C. Open Shop Influence

In the open shop arrangement the construction company is not signatory to a labour agreement with a construction union. The construction manager hires his work force from the open market without regards to union status. The construction manager can manage the project. The construction manager can recruit, hire, train, promote, or discharge as he or she desires. The open shop provides the construction manager with the greatest flexibility in establishing and implementing a multi-faceted motivation program. The open shop construction firm may decide the size of the work crews.

D. Motivation within the System

It has already been stated that the construction manager must be resourceful and creative in motivating the construction worker.

- 1) Incentives
- 2) There is a wide use of incentives in industries other than construction. Incentives provide tangible rewards when given to those who perform at a given level. The measure used to decide those rewards should be carefully set and should be clearly linked to performance. Profit sharing is the most frequent type of incentive program used by construction companies. Providing For Job Security
- 3) Providing for job security in the construction industry is particularly difficult. Most construction workers expect to be changing job from time to time. There is no conclusive workable plan that fully addresses this issue. Yet, there are a few things that can be done by the construction manager. Economist argues that better methods mean lower costs which mean more construction. Quality Circles
- 4) The concept of quality circles originated in Japan. A quality circle is defined as small group of volunteers performing similar work who meet regularly to identify and analyze problems they encounter in their work environment, to propose solutions to management, and

assists management with implementation. Quality circles can be effective as a form of participative management. Work Facilitation

- 5) Since mankind's beginning, the individual has sought to build things never before built or become the best builder of whatever the individual builds. Humans are compulsive builders. The individual takes pride in becoming a capable builder. The craftsman wants to see the results of his endeavor. For the most part, human nature is such that craftsmen want to leave behind a product for which they can proclaim proud ownership. Construction Worker Recognition

On average, construction workers receive little or no recognition for their efforts. Praise and status provided by the construction manager satisfies ego needs. Recognition can include craftsman-of-the-month awards, crew-of-the-month awards, recognition of the entire project, an active public affairs program, and other methods. Status can be conferred on the worker by the decisions that he or she is empowered to make.

VI. SOURCES OF JOB SATISFACTION

- 1) Organizational factors
- 2) Work environmental factors
- 3) Factors related to work itself
- 4) Personal factors

A. Organizational Factors

1) Salaries and Wages

Studies conducted by Locke indicate that pay is a primary determinant of job satisfaction, especially when it is perceived as fair and equitable compared to others and relative to employee's own efforts and contributions. Higher pay reflects higher degree of contribution towards organizational operations and welfare and is considered a symbol of achievement.

2) Promotions

Promotion indicates an employee's worth to organization which is highly morale boosting. A promotion also involves positive change in higher salary, less supervision, increased responsibilities decision making freedom.

3) Company Policies

A highly authoritative and autocratic structure may produce more resentment on part of employees who may want more open and democratic style of leadership. Liberal and fair policies are usually associated with job satisfaction.

B. Work Environment: These Factors Include

1) Supervisory Style

A close relationship between the supervisor and worker and worker participation in decision making about such issues that directly concern the worker are highly conducive to job satisfaction.

2) Work Group

Larger group sizes usually lead to lower level of job satisfaction due to fact that large groups lead to poor interpersonal communication, reduced feeling of togetherness and difficulty in getting to know each other more closely. Smaller groups provide greater opportunity for building mutual trust and understanding.

3) Working Conditions

Good working conditions are highly desirable because they lead to greater physical comfort. People put a high premium on a clean and orderly work station and factors such as heating, air conditioning, humidity, lighting, and noise level, availability of adequate tools and equipment and desirable work schedule. All contribute to higher level of satisfaction.

C. Work Itself

The job content has two aspects one is 'job scope' which involves amount of responsibility, work pace and feedback provided. The higher the level of these factors, the higher the job scope and thus higher the level of satisfaction. The second aspect is variety. It has been found that a moderate amount of variety is most effective. Excessive variety produced confusion and stress and too little variety causes monotony and fatigue which are dis-satisfiers. Role ambiguity and role conflict are to be avoided because employees feel very unhappy if they do not know exactly what their task is and what is expected of them.

D. Personal Factors

People with generally negative attitudes about life and pessimists always complain about everything including the job. No matter how good the job is, such people always find something wrong with it to complain about. Age, Seniority and tenure have considerable influence on job satisfaction. Employees who do not move up at all with time are more likely to be dissatisfied with their jobs. Employees with tenure are expected to be highly satisfied with their jobs. Some of the personality traits that are directly related to increased job satisfaction are self-assurance, self-esteem, and maturity, and decisiveness, sense of autonomy, challenge and responsibility.

VII. DESIGNING MOTIVATING JOBS

A. Work Redesign

Work redesign involves revising job descriptions and changing the nature of work so as to induce a higher level of motivation among workers. Hackman has suggested four benefits of work redesign. First, that it alters the basic relationship between people and their jobs. People who are happy with the content and context of work are highly intrinsically motivated. If some aspects of the job are not satisfactory to the employees, then these aspects should be changed to suit the employee's convenience. Secondly, it is believed that by experiencing more rewarding work, the employees develop more favorable attitudes towards the organization. Such attitude reinforces behavior which is desirable and more permanent. Thirdly, work redesign opens opportunities to initiate changes in other areas. The ability to initiate change in one area makes it easier and more conclusive to initiate changes in other areas. Finally, work redesign makes an organization people oriented rather than machine oriented.

B. The Job Characteristics Model

Proposed by Hackman and Oldham and is known as the "Job Characteristics Model" or JCM. At the foundation of this model lie three critical psychological states of workers.

- 1) Experienced meaningfulness: It is the degree to which the individual experiences and perceives his work as generally meaningful, valuable and worthwhile by some system of values that he accepts.
- 2) Experienced responsibility for work outcomes: It is the degree to which an individual feels personally responsible for the outcome of his efforts.
- 3) Knowledge of results. The employee must be able to determine the degree of quality of output of his efforts. He must receive frequent and regular feedback from his supervisors as to how satisfactory his performance continues to be.

As Hackman explains, "The model postulates that integral rewards are obtained by an individual when he "learns" (knowledge of results) that he "personally" (experienced responsibility) has performed well on a task that he "cares about"

When these three states are present, an individual will feel good about himself when he performs his work well. The higher the level of these states, the higher will be the satisfaction that an employee will experience when he performs well.

The job Characteristics Model further proposes that these three psychological states are triggered by five characteristics of the job, which it describes as "Core Job Dimensions"

These core job dimensions are described as follows

- 1) Skill variety. When there are several skills involved in a job it will break the monotony of doing only one thing over and over and thus keep the worker interested in his work.
- 2) Task identity. It is the degree to which the job requires completion of the "whole" identifiable unit of work from beginning to the end with visible and tangible outcomes.
- 3) Task significance. It is the degree to which the job has a significant impact on the lives or work of other people either within the organization itself or in the outside environment.
- 4) Autonomy: it is the degree to which the job allows the worker substantial freedom, independence and discretion in scheduling his own work and in establishing procedures to be employed in carrying it out.
- 5) Feedback is the degree to which the work performance results in the worker obtaining direct and clear information about the effectiveness of his performance.

VIII. ANALYSIS OF QUESTIONNAIRE

After going through various research papers and discussions with civil engineers, builders and workers on site following questionnaire is prepared to understand their present state of mind and to find out factors which can motivate them for increasing their work productivity. Following are some of the questions.

1) Q.Which type of incentives motivates you more?
Type of incentive which motivates a person depends upon his living conditions, culture, thinking etc.It changes from person to person. Here we tried to find out a common incentive which is applicable for more than 50% of the surveyed person.

2) Q.Does top management considers you in decision making?

Involving in decision making makes an employee feel important and attached to the company.

3) Q.Are your goals & company goals aligned clearly?
If an employee feels his goals are aligned with company, he will take more efforts for his job as the results are clear in his mind.

4) Q.Is there opportunity for you to give feedback? Is it taken seriously?

If Yes the employee will feel he is free to express even his negative feelings and also he knows once the company knows about it, surely it will try for betterment of conditions.

5) Q.Do you feel your real skills & capacities are put to use on your job?

This is very important because the employee should not feel that there is no scope for him to use his skills for betterment in his jobs and consequently in his life.

6) Q.Do you have job security?

If not then employee will try to search a job which will give him job security. So that he will be sure about his future plans to some extents.

7) Q.Till what extent are working conditions (Safety & health) good?

If a person is highly motivated then also he will not be able to give his 100% if the working conditions are not suitable.

IX. RECOMMENDATIONS & CONCLUSION

Construction tasks are expensive and frequently cause in arguments and claims, which generally affects progress of construction projects. The environment of construction organizations should be suitable to implement projects with successful completion. In the construction industry, it is necessary to find the weaknesses of particular task in order to solve and overcome them. Mentioned below are the recommendations which were found to be important factors for improving labour productivity in the construction industry.

- 1) A financial incentive in the form of best employee of the year should be implemented to create competition among the employees, thus achieving better productivity.
- 2) Absenteeism at work site can be reduced with inclusion of appropriate paid time off and vacations to all employees.
- 3) Recruiting manager and project managers should recruit appropriate candidate to particular task. Friendly relations should be maintained with laborers and made aware of their importance to the organization.
- 4) It should be seen that goals of company and employees should align clearly because of this employees will take more efforts to achieve company goals as ultimately they achieve their goal by doing so.
- 5) Engineers and workers should be given chance to give feedback. This makes them feel important moreover, their feedback will let us know the drawbacks in policies or nature of work, etc. Steps can be then taken to remove these drawbacks and increase efficiency of working.
- 6) Every engineer and worker should be given chance to utilize and show his skills and capacities. This will make

- him proud of his work. It will also make others having less skill motivated to improve their skills.
- 7) Having job security is most important criteria to be totally dedicated to a company. At some point in life, everyone wants to be settled. Employees might be dedicated to a company till they are new and seeking experience and fineness in their job. But after this, if they do not find job security they may go where they get it. The company will only then be training employees and losing them.
 - 8) Organizations should make sure there is enough lighting present at the construction sites which can indirectly reduce number of accidents. Continuous safety training and meetings should be arranged to achieve better performance in labour productivity. Purchased material should be stored at appropriate location and should be easily accessible and lose to construct buildings to avoid wasting labour time for multiple-handling materials.
 - 9) Training system should as best as possible. Proper training will help in making strong structure and also in safety of all working on site.
 - 10) Company's internal and external image should be consistent as it will increase the respect of the company in eyes of its employees. There are the ones who do publicity in outside world. If they make a good image of company in outside world, it will be beneficial to company itself.
 - 11) Company should try to make interesting with the help of methods such as job rotations, incentives for the one who does a job best, giving proper breaks, forming healthy work groups etc. So employees are happy to come to work every day.
 - 12) Retention of qualified employees is must. Always appointing a new staff and training them will lead to wastage of time and money. Qualified employees are asset to a company. Hence, they must be retained to attract more qualified employees to join the company.
 - 13) All should be given equal workload. Anyone should not feel that he is doing more work than anyone else. This will lead to dissatisfaction. If such thing happens then proper compensation should be given to person working more.
 - 14) One of the basic needs of human is to get appreciation. This makes him feel he is right and he strives to do that work again and in a better way so that he gets more appreciation. Proper appreciation at proper time may be very helpful in increasing motivational level. Thus seniors should encourage juniors and subordinates when they perform a good job.
 - 15) A detail schedule of material supply schedule for each project should be provided by the contractors. It should contain the time required to supply materials and the availability of the local market to furnish the required materials in time. Extra attention is required on quality of construction materials and tools used in their projects because using suitable materials and tools reduces both the time taken to finish the work and wastage of materials. Using suitable materials and tools also has a positive effect on the task and thus, better labour productivity can be achieved.

- 16) All human beings have some talent. They can create miracles if they get chance. Similarly if employees have some new ideas then they should be given chance to innovate their work. May be any idea proves to be helpful increasing productivity.

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