

Motivation of Survey Employees in Construction Projects

Steve Y. W. Lam and Conrad H. W. Tang

Department of Land Surveying & Geo-Informatics
Hong Kong Polytechnic University, Kowloon, Hong Kong, China

Abstract

This paper provides surveyors with a practical and concise explanation of the management concepts and techniques needed to motivate today's survey employees in construction projects. It reviews key motivation concepts, and describes how to apply the theory into practice in accordance with the ISO 9001:2000 standard.

1 Introduction

Motivation is the driving force within individuals that drive them physiologically and psychologically to pursue one or more goals to fulfill their needs or expectations. Motivators may be intrinsic or extrinsic. An example of an intrinsic motivator is the self-fulfillment of a worker as a result of performing a task well. An example of an extrinsic motivator is the award of monetary bonus for extra effort input by a worker. Most of the theorists assert that intrinsic motivators are better than extrinsic ones. Numerous studies have proved that productivity of workers is directly related with motivation. Workers who are highly motivated will input maximum efforts because of self-fulfillment from doing so, and resulting in high productivity.

In the past two decades, the authors identified three revolutionary changes in the quality management systems of surveying and construction industries. Firstly, consensual management has gradually replaced the traditional hierarchical structure of management systems. Secondly, the adoption of "systems approach" or "systems engineering" to deal with organizational and technical problems has been proved successful in managerial processes. Thirdly, organizations manage construction and survey teams on project basis as the more efficient way to accomplish their strategies and objectives.

Overseeing the newly created Total Quality Management (TQM) system under ISO 9001:2000 Standard for the construction industry, this paper briefly describes the methods to motivate survey employees during the life cycle of a construction project. In this paper, survey employees are land or engineering surveyors who are responsible for geodetic control, detail mapping, setting-out, as-built and deformation monitoring surveys in construction projects. They are the front line workers particularly in setting-out the precise geometric models of structures under construction. In fact, these survey operations exist from start to finish in construction projects.

2 Review of Motivation Concepts

The following motivation theories are often applied to increase productivity in construction projects:

- a) Theory of Maslow (1954) based on hierarchy of human needs
- b) Two-factor Theory of Herzberg et al. (1959) based on hygiene factors and job enrichment factors
- c) Theory X and Theory Y of McGregor (1960) based on ways of perceiving workers
- d) Expectancy theories of Vroom (1964) and Lawler (1973)
- e) Theory Z of Ouchi (1981) based on holistic concern for employees
- f) Motivation schemes under the current practice of TQM in construction projects.

In his theory of motivation, Maslow (1954) classifies the desires or needs of human beings into physiological, safety, belongingness, esteem, and self-realization needs in ascending order of importance. Examples of physiological needs are salary, housing, food and clothing. Examples of safety needs are safe working environment, freedom from pain and threat, and job security.

Belongingness needs include affection from friends and family, and the feeling of belonging to a group. Esteem needs are the desire for respect and recognition that satisfy one's ego. Self-realization or self-actualization needs are individual's personal sense of achievement and feeling of self-fulfillment. Maslow (1954) asserts that the low-level need must be satisfied before attempting to reach the need of the next higher level; and that once a need is satisfied, it is no longer a motivator of behavior with the exception of esteem and self-realization needs.

Herzberg et al. (1959) divides Maslow's hierarchy into lower-level and higher-level needs according to hygiene factors and job enrichment factors respectively. Hygiene factors are the basic needs to maintain a reasonable level of satisfaction among employees. Hygiene factors, also known as dissatisfiers, do not generate satisfaction but they would cause dissatisfaction if they do not exist. Job enrichment factors, also known as satisfiers, are related to job content and concerned with high-order factors of responsibility, growth, recognition, and achievement. Satisfiers are required to motivate a worker at high level of productivity. A motivational model developed after Maslow and Herzberg is given in Table 1.

Table 1 Motivational model developed after Maslow (1954) and Herzberg et al. (1959)

Motivational Factors	Priority of Human Needs	Examples of Needs and Motivational Factors
Job Enrichment /Long-term Factors	Level 5: Self-realization Needs	Achievement in work Challenging job
	Level 4: Esteem Needs	High position/ status Advancement recognition
Hygiene /Short-term Factors	Level 3: Belongingness Needs	Affection from team members Professional affiliations
	Level 2: Safety Needs	Job security Safe working environment
	Level 1: Physiological Needs	Salary Housing

The empirical works of Borcharding and Garner (1981) have contributed to the understanding of factors constraining worker performance that would cause dissatisfaction among construction workers. These factors include material availability, tool availability, redoing work, crew interfacing, overcrowded areas, inspection delays, craft turnover, craft absenteeism, foreman changes and incompetence of foremen. Borcharding and Garner (1981) indicate that satisfiers or motivators common to construction projects are good craft relationship, good orientation program, good safety program, work itself, overtime, pay, recognition, goals defined, open house and project tours, projects well-planned and suggestions solicited.

McGregor (1960) postulates Theory X and Theory Y based on extreme assumptions about people and work. Theory X assumes that average employees dislike work, and that the only way to maintain or increase productivity is to simplify the production process, supervise the employees closely, and motivate them in short term through financial incentive schemes. Theory Y assumes that average employees desire self-direction and self-control, seek and accept responsibility, enjoy physical and mental effort, and have the potential to be self-motivating.

The expectancy theories of Vroom (1964) and Lawler (1973) are regarded by Maloney (1986) as the most useful approach to analyzing the three important variables (the individual, the job and the work environment) that affect motivational schemes, in particular, in the use of incentives in construction projects. To relate performance and motivation in mathematical form, Vroom (1964) expresses performance (P) as a function of the product of motivational force (M) and workers' ability (A). That is,

$$P = MA \quad (1)$$

where $M = \Sigma(EIV)$; E represents the worker's expectancy, probability value from 0 to 1, to achieve the expected outcome; I represents the instrumentality of being rewarded or punished, probability value from -1 to +1, for the expected outcome ; V represents the valence or perceived value of the expected outcome to the individual.

Lawler (1973) revises Vroom's expectancy model and expresses motivational force as:

$$M = (E \rightarrow P) \Sigma (P \rightarrow O) V \quad (2)$$

where (E→P) represents the worker's effort-performance expectancy, probability value from 0 to 1, to achieve the expected outcome; (P→O) represents the performance-outcome expectancy, probability value from 0 to 1, to achieve the expected outcome; V represents the valence of the expected outcome to the individual.

These probabilistic models are useful in motivation programs to evaluate the morale of employees in construction projects.

According to Theory Z of Ouchi (1981), the key factors to managerial success are technology and a holistic way of managing employees by a strong company philosophy, a distinct corporate culture, long-term staff development, staff-participation in decision-making, and modification or improvement of worker behavior. The emphasis of humanized working conditions increases productivity and profits to the company and self-esteem for its employees. The theory refers mainly the elements of Japanese managerial success in the 1980s but plays down on cultural and individual differences in higher order needs among employees.

Early in Year 2001, ISO 9001:2000 has officially replaced ISO 9001:1994, ISO 9002:1994 and ISO 9003:1994 in the construction industry, and has asserted the role of the global standard as a TQM standard, in stead of, as a quality assurance standard of the previous version. Under the standard, an organization treats employees as individuals by job descriptions, appraisal schemes and reward systems. It takes into account individual differences in motivation at work, and provides opportunities for people to meet their esteem and self-realization needs.

Broadly speaking, methods to motivate employees can be categorized into need-based, process-based or reinforcement based. Maslow's Needs Hierarchy, Herzberg's Two-factor Theory, McGregor's Theory X and Theory Y, and Ouchi's Theory Z are typical need-based approaches focusing on the role of motivational dispositions in driving an employee to complete a job with the desirable productivity and quality. Vroom's Expectancy Theory and ISO 9000's TQM standards are process-based approaches in through which motivation become aroused and translated into the desirable work behavior. Under the TQM system, reinforcement approaches are applied to change or modify employees' working behavior and learning attitude through the use of contingent awards or punishment, and voluntary life-long learning programs. The applications of these theories in both short and long term motivation programs are discussed in the following sections.

3 Motivation of Survey Employees in Short Term

Need theories of Maslow and Herzberg form the basis of motivational models for motivating survey employees in construction projects. As shown in Table 1, once an employee satisfies his physiological needs, he becomes motivated to satisfy his safety needs, belongingness needs, esteem needs and self-realization needs. Physiological needs, safety needs, and belongingness needs are needs of short-term motivators because a need from these categories is no longer a motivator once it is satisfied. Esteem needs and self-realization needs are needs of long-term motivators for employees to achieve high performance and productivity. It must be noted that short-term needs must be satisfied before an employee can be motivated to satisfy long-term needs.

In order to fulfill physiological needs and to attract survey workers to stay with the company, a suitable salary scheme and employment policy should be established provided that the salary policy, the salary structure and the master pay scale comply consistently with labor legislation and the market level. Although extrinsic rewards such as salary and financial benefits do not motivate

employees to high work performance, they could lower employees' dissatisfaction. The basic needs of food and shelter are of minor concern to today's survey workers because these needs are always met and supported by existing social welfare and security system.

Job security and safety needs correspond to positive sense of safety and well being of the employees. Safety training is mandatory to all survey workers in construction projects. A survey organization should maintain a high profile of job security and safety in the public in order to satisfy employee's basic needs in the work environment, to motivate workers staying in the organization, and to attract talented workers to join the organization.

In order to satisfy the feeling of belonging to a project team, induction programme for new employees should be organized to introduce them the company objectives, their colleagues, the facilities and the working environment. Very often, survey organizations allow survey workers to choose their partners or allow party chiefs to choose new recruits. Survey employees having harmonious teams lead to better productivity and lower the rate of labor turnover.

In modern construction projects, the turnover rate of survey and other construction workers is often quite high because most of the contracts, large or small, must be completed within a relatively short period of time. Thus, TQM system is always built into construction processes that form the value chain and support activities. In doing so, Quality System Manuals, Project Quality Plans, Quality Procedure Manuals, Department/ Section manuals, and Operation/ Work Instructions and Quality Records are designed by senior management (Lam and Tang 2000). They are published for all levels of survey employees so that each employee is familiarized with the company objectives and becomes competent at his/ her job. These are the methods being applied in construction projects to fulfill the basic needs of survey employees in short term.

4 Motivation of Survey Employees in Long Term

Long-term motivation schemes should be implemented in parallel with fulfilling the short-term needs of survey employees. The authors opine that the following managerial approaches are useful to motivate employees in long-term:

4.1 Proper Resource Management and Job Design

It has been found that a productive and meaningful job creates satisfaction at all levels of survey employees. By adequate planning and insuring that survey instruments and equipment, materials, manpower and supporting data are readily available, a survey job will become productive. Four basic principles of designing meaningful jobs are job enrichment by increasing decision-making opportunities of individuals, job rotation to reduce boredom and increase skills, establishing autonomous survey teams and implementation of the TQM system under ISO 9000.

4.2 Life-long Learning Programs

The provision of training will intrinsically motivate employees because the training will help them accomplish the tasks with better efficiency. This has been proved by the survey of Dulaimi and Beckingsale (2001) on construction workers that, under the Investors in People (IiP) Standard of the United Kingdom, employees are motivated by keeping their quality and skill level in line with the business objectives through long-term staff development of the organization.

Training, as conducted by the survey manager to his/ her subordinates, provides an excellent environment for communication with survey employees for potential areas of improvement and recognition of achievements. Under ISO 9001:2000 in the construction industry, it is not enough for a company to provide training to its employees; it further requires a company to evaluate whether the training produces competent workers for the job.

4.3 'Open-door' Communication

Survey workers are highly motivated if they are allowed to convey their opinions to their supervisors and managers. Therefore, communication channels for different organizational levels

and cross-levels should be established for the exchange of information and workers' involvement in decision-making. An 'open-door' policy should be established so that technical problems, dissatisfactions or misunderstanding can be solved by direct discussion in site meetings, telephone calls and e-mails. This kind of network of formal and informal sources also keeps managers well informed about what is happening within their organization.

4.4 Effective Rewarding System

Rewarding competencies of individuals through financial incentive plans, recognition programs and behavior modification strategies are the most effective way to motivate employees. Rewards can be monetary (e.g. salary increase), job related (e.g. favorable performance appraisal), or in the form of status upgrade (e.g. promotion to higher positions).

Under the rewarding system, employees should be treated fairly and equally by clearly defining and communicating the system to them, making honest appraisals, and rewarding according to effort of participation, performance, skill level and desired behavior of the employees. The employees should be able to understand the rewarding system easily and the rewards they will receive upon various levels of their performance and in direct proportion to their increased productivity. In construction projects, team unit rather than individual is normally adopted for incentive evaluation.

4.5 Diverse and Contingency Style of Leadership

Working for a credible leader who inspires confidence among employees increase motivation and commitment. Survey managers and party chiefs are leaders in construction projects in which contingency approach to TQM is always emphasized. Therefore, diverse and contingency style of leadership is required of them. Survey managers and party chiefs are expected to be adaptive, directive, supportive, achievement-orientated, relationship-orientated, and physically and mentally fit in performing their duties. They should demand high standards of performance from group members by giving frequent feedback to group members on their performance toward satisfying customers.

Uncertainties are always found in managing a project in which contingency allowance in time, budget and performance/ quality is necessary. Under these contingency factors, survey leaders should be able to develop a set of backup plans or contingency plans which will be used if the original plan can not be implemented or a crisis happens, and to recover quickly from setbacks such as budget cuts and shortening of time schedules. By having a diverse and contingency style of leadership, survey managers are able to inspire confidence and support among the subordinates who are needed to achieve organization goals.

4.6 Empowering and Valuing Survey Employees

Empowering employees means that employees at all levels are responsible for their actions and given the authority to make decisions on their own work. It enhances the employees' feelings of personal mastery and self-determination, encourages participation by all parties in decision making, and results in democratic distribution of power in construction projects (Newcombe 1996). It increases satisfaction, self-efficacy, loyalty and thus motivation of employees. Over-worked situation is quite common in construction projects. By empowering survey employees in building their self-confidence and management skills in performing their duties, they would be less liable to feel over-worked.

Rather than just looking at their job-related skills, most of the surveyors are employed based on their values that must be consistent with those of the company. Therefore, valuing programs are needed to reinforce survey employees the skills necessary to deal effectively with each other and with customers, to respect individual difference and value, and to create harmony in work.

4.7 Continual Assessment and Improvement of Motivation Programs

Managers should implement the motivation program progressively and monitor the outcome at regular intervals to see if the program is having the desired effect. Prior to implementation,

workers or their representatives should be consulted for opinions and participation towards the success of the program. In construction projects, direct methods to evaluate the rewarding system and the level of performance are work measurement techniques (e.g. time study and activity sampling) and learning curve method. Both empirical methods and expectancy methods are also recommended by the authors to monitor motivators of work behaviors in both the short term and the long term. Warren (1989) outlines a motivation program which can be assessed analytically by cost-accounting systems, cost-control systems, work sampling (e.g. statistical profile for each crew), records of workers' of absenteeism, turnover rate, safety records and quality improvement (e.g. rate and cost of repair jobs).

5 Conclusion

Key motivation concepts based on the theories of Maslow, Herzberg, McGregor, Vroom, Lawler, Ouchi and others are introduced in this paper. As integral components of a TQM system, methods of motivating survey employees in both the short term and long term in construction projects are presented.

Short-term motivation schemes are required to satisfy the basic needs of surveyors to join the company. The basic needs are physiological needs, safety needs and belongingness needs. Equitable salary and employment policy, safe working environment, stable employment and induction programme for new employees should be provided by the employer in order to motivate its employees to work efficiently.

In order to maximize productivity toward the success of the TQM system, long-term motivation schemes are required to fulfil higher-order needs of esteem and self-realization of employees. Therefore, proper human resource management and job design, life-long learning programs, open-door communication, effective rewarding system, diverse and contingency style of leadership, empowering and valuing employees, and continual improvement of motivational schemes are recommended to enhance motivation and retain employee commitment in the long run.

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