# Understanding Motivators and De-motivators for Software Engineers – A Case of Malaysian Software Engineering Industry

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**Abstract.** One of the key components which has an impact on the performance and productivity of individuals in the organization is motivation. Software engineering lacks the studies on motivation. Even though those studies which have been done so far are mostly from Western countries. This paper tries to fill this gap by understanding motivators and de-motivators in the field of software engineering from Malaysian perspective. Questionnaire method was used to collect the data. Results show that recognition, technically challenging work, job security and feedback are the major motivators in the field of software engineering. As far as de-motivators are concerned, main de-motivators includes lack of promotional opportunities, less competitive pay and unfair reward system. These results confirmed that the importance of motivators and de-motivators vary between Western and Malaysian cultures.

**Keywords:** Motivators, De-motivators, Software Engineers, Malaysia.

## 1 Introduction

World economy has moved from industrialization to knowledge economy. Due to this shift, the major portion of Gross Domestic Product (GDP) of many countries in Organisation for Economic Co-operation and Development (OECD) is based on knowledge based activities [1]. Computer software and service industry is one of the examples of knowledge based industries and it is a fast growing industry [2]. Importance of software engineering can be imagined from the findings that this industry is already a leading contributor to world economy and employment [3].

Despite the importance of computer software and service industry, a small number of studies have been done on motivating software engineers. Therefore motivating software engineers continues to be a challenging task [4] because of the less research in this field and incompetence of software engineering managers in social science aspects like motivation. Although, corporate strategic advantage can be achieved through retaining “committed and productive employees" and retention and

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motivation are closely related [5]. This employs that motivation plays a vital role in the overall benefit of organization. Question arises that why motivating software engineers is a difficult task? One of the main reasons is the inability of software engineering managers to motivate their sub-ordinates as they do not know about motivational practices [6]. Their background is from technical side and they lack managerial experience. They are promoted to managerial posts based on their skills in technical area and once they become managers or group leaders they have to cope with issues from human behaviour like how to motivate subordinates, how to get maximum output from individuals by keeping their interests in mind. These are not the areas of their (software engineering managers) expertise. Therefore, such kinds of studies are needed in the field of software engineering which should give software engineering managers an insight of motivating software engineers. In other words, studies should be conducted to analyze what motivates and de-motivates software engineers in the field of software engineering. These studies are also needed because motivation increase productivity but it is a difficult concept when it comes to software engineers [6] because software engineering is a distinct group [7], [8].

Not many studies have been conducted on motivating software engineers or analyzing motivators in the field of software engineering in Malaysian environment. Few of the studies which have been done include US and European countries [9], Egypt [10], Finland, Nigeria and Estonia [11], Pakistan [12] and Brazil [13]. As discussed above that software engineering is a distinct profession so there is a need to study how software engineers get motivated or de-motivated as culture of every part of the world is not same. One motivator might be important for software engineers form one part of the world but not for others.

This paper aimed to find out what are the motivators and de-motivators in the field of software engineering for Malaysian software engineers. Do they consider same motivational and de-motivational aspects as other software engineers from other parts of the world? This study will help software engineers and managers in the field of software engineering by provide an insight about motivational aspects in this field.

## 2 Literature Review

### 2.1 Motivational Theories and Software Engineering

Software engineering does not have its own motivational theories and till now motivational theories from social science are used in this field. One of the most comprehensive review works on motivation in software engineering was done in [14]. Table 1 show the name of theories and their explanation which are from social science but used in software engineering. These theories can be categorized into process base theories (motivation is described as a process based on more than one activity) and content theories (motivation is measured at a single point of time and is not considered as a process of multiple activities). Among these theories, Job Characteristic Theory and Herzberg Motivational Theory have been used most of the time.

### 2.2 Motivators for Software Engineers

Demand and turnover both for Management and Information System (MIS) professionals are reported to be high [15]. This higher rate of turnover adversely affects any organization and especially software engineering firms. Reason being that software engineering is a knowledge oriented profession [16] which means that if a software engineer leaves his/her organization, the knowledge possessed by that person will also go with that person. This will leave a gap between required and existing knowledge. Therefore, organization as a whole will suffer in case of higher turnover. It has been reported that de-motivation leads to absenteeism and turnover [9] thus it can be concluded that one of the means to reduce higher turnover is through motivation.

Many motivational aspects have been studied by researchers in the field of software engineering. Like "the need to identify with the task, employee participation/involvement, good management, career path, sense of belonging, rewards and incentive, recognition, technically challenging work, feedback and job security" [9]. Among these motivational aspects, mostly cited is "the need to identify with the task" [9]. This means that if software engineers know well about their job, tasks are clear to them, they know how it benefits customer(s), organization and themselves, they will be motivated to do that kind of job.

**Table 1.** Various Theories of Motivation

| Theory | Explanation | Category |
|---|---|---|
| Equity Theory [25] | Balancing individual's input versus output received from organization | Process |
| Stimulus Response Theory [26] | Individual's behaviour is based on punitive or rewarding stimuli | |
| Job Characteristic Theory [27] | Work itself is the main motivator which is measured on five dimensions | |
| Goal Setting Theory [28] | Goals should be set but these goals should be realistic, measurable and feedback should be provided | |
| Expectancy Theory [29] | Motivation is based on expectation of positive outcomes | |
| Need Theory – Malsow [30] | During different life stages, motivational needs changes. Hierarchy of needs was presented in this theory | Content |
| Need Theory – McClelland [31] | Achievement, affiliation and authority are the motivational needs of an individual | Content |
| Motivation - Hygiene (Herzberg) [32] | Motivational factors were categorized into intrinsic and extrinsic factors | |

Source: [14]

Rewards are another important factor for the motivation, a basic factor according to Maslow's Hierarchy of Needs. Besides reward, career path is also important for software engineers. Those organizations, where individuals do not have enough growth opportunities, they will face higher turnover rate as their employees will quit [17].

Problem solving is one more factor discussed by researchers as a motivator in the field of software engineering. As each software is different from other softwares in some aspects based on the customer's requirements, thus software engineers have to deal with different problems while providing solutions to the customers. This leads them to problem solving on regular basis and it is a challenging work. Therefore, technically challenging work is considered as a crucial motivator in the field of software engineering [9].

Job security is also considered as a motivator in the field of software engineering [9]. But the aim is that whether motivational practices in an organization should be individual centric or organization centric? Because, many individuals especially beginners, use organizations as a ladder to move ahead. These people will leave an organization in 3-4 years on average [18]; [19]. Point is, instead of only focusing on job security, organizations should focus on other motivational aspects as well, because those who want to quit the organization in 3-4 years might be retained by giving them other motivational benefits.

### 2.3 De-motivators for Software Engineers

Just like any other profession in the world, software engineering also has its own de-motivators. Some of them are work and home life imbalance, stress [20], [17], less feedback [21], [10]. Feedback from supervisors and colleagues, especially supervisors is important, otherwise individuals may not know about their performance which can be a cause of de-motivation. Insufficient salary [10], [22] and lacking growth opportunities [22], [23] are also important de-motivating factors.

## 3 Research Methodology

Personally Administered Questionnaire (PAQ) method was used to collect the data. Simple Random Sampling (SRS) technique was used to select the respondents. SRS was used because results can be generalized after using this method. Data was collected from 80 respondents. Factors mentioned in [9], for motivators and de-motivators in the field of software engineering were used in the questionnaire. These factors were used to compare the results of this study with those done in other parts of the world. Data was analysed using descriptive statistics, frequency method (number of times respondents selected that option).

## 4 Results and Analysis

Table 2 presents the demographic information. 93.75% respondents were male whereas only 6.25% were female. 50% had 3-4 years of experience while 25% had 1-2 years of experience. Most of the respondents were software developers (43.75%) followed by software testers (37.5%).

**Table 2.** Demographic Information

| Details | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 75 | 93.75 |
| Female | 5 | 6.25 |
| **Experience** | | |
| Less than 1 year | 9 | 11.25 |
| 1-2 | 20 | 25 |
| 3-4 | 40 | 50 |
| 5-7 | 11 | 13.75 |
| More than 7 years | - | - |
| **Job Description** | | |
| Software Developer | 35 | 43.75 |
| Software Testing | 30 | 37.5 |
| Software Maintenance | 12 | 15 |
| Software Quality Assurance | 2 | 2.5 |
| Other | 1 | 1.25 |

Table 3 reports the motivators for software engineers and their frequency, based on the feedback provided by the Malaysian software engineers. As indicated in the research methodology, factors in questionnaire were taken from the study done by [9]. Results show that among the highly reported motivators are recognition (frequency = 32), technically challenging work (frequency = 28), job security (frequency = 26), feedback (frequency = 25), career path (frequency = 24), work/life balance (frequency = 23) and task significance (frequency = 23).

De-motivators for software engineers indicated by Malaysian software engineers are presented in table 4. Among the mostly reported de-motivators are lack of growth opportunities (frequency = 20), insufficient salary (frequency = 19), poor reward system (frequency = 18), no involvement in decision making (frequency = 16), stress (frequency = 14), unrealistic or unachievable goals (frequency = 14) and poor management (frequency = 14).

**Table 3.** Motivators for Software Engineers

| Motivators | Frequency |
|---|---|
| Recognition | 32 |
| Technically challenging work | 28 |
| Job security/stable environment | 26 |
| Feedback | 25 |
| Career Path (opportunity for advancement, promotion prospect, career planning) | 24 |
| Work/life balance (flexibility in work times, work location) | 23 |
| Making a contribution/task significance (degree to which the job has a substantial impact on the lives or work of other people) | 23 |
| Rewards and incentives | 20 |
| Autonomy (e.g. freedom to carry out tasks, allowing roles to evolve) | 19 |
| Variety of work (e.g. making good use of skills, being stretched) | 18 |
| Trust/respect | 17 |
| Appropriate working conditions/environment/good equipment/tools/physical space | 17 |
| Development needs addressed (e.g. training opportunities to widen skills; opportunity to specialise) | 15 |
| Employee participation/involvement/working with others | 14 |
| Identify with the task (clear goals, know purpose of task, how it fits in with whole, producing identifiable piece of quality work) | 12 |
| Good management (senior management support, good communication) | 11 |
| Sufficient resources | 11 |
| Empowerment/responsibility (where responsibility is assigned to the person not the task) | 10 |
| Sense of belonging/supportive relationships | 9 |
| Equity | 9 |
| Working in successful company (e.g. financially stable) | 6 |

**Table 4.** De-Motivators for Software Engineers

| De-Motivators | Frequency |
|---|---|
| Lack of promotion opportunities/stagnation/career plateau/boring work/poor job fit | 20 |
| Uncompetitive pay/poor pay/unpaid overtime | 19 |
| Unfair reward system | 18 |
| Lack of influence/not involved in decision making/no voice | 16 |
| Stress | 14 |
| Unrealistic goals/ phoney deadlines | 14 |
| Poor management (e.g. poorly conducted meetings that are a waste of time) | 14 |
| Interesting work going to other parties (e.g. outsourcing) | 13 |
| Poor communication (Feedback deficiency/loss of direct contact with all levels of management) | 11 |
| Risk | 10 |
| Bad relationship with users and colleagues | 10 |
| Producing poor quality software (no sense of accomplishment) | 10 |
| Poor working environment (e.g., unstable/insecure/lacking in investment and resources; being physically separated from team) | 8 |
| Poor cultural fit/stereotyping/role ambiguity | 7 |
| Inequity (e.g. recognition based on management intuition or personal preference) | 5 |

## 5 Discussion

A comprehensive work in studies [9]; [24] concluded that most of the work on motivation in software engineering field is dominated by Western studies. The motivators in the field of software engineering which are important in Western culture are identifying with the task (frequency = 20), employee participation (frequency = 16), good management (frequency = 16), career path (frequency = 15) and rewards (frequency = 14) [9]. Our findings which are based on Malaysian culture indicated that motivators in the field of software engineering from Malaysian software engineer's perspective are different from a study conducted in Western environment. Important motivators for Malaysian software engineers are recognition, technically challenging work, job security, feedback, career path, work/life balance and task significance.

Similarly, there is a difference between importance of de-motivators in the field of software engineering in Western and Malaysian cultures. Studies [9], [24] which summarized results of Western based studies, highlighted the following de-motivators cited most of the times. Poor working environment (frequency = 9), poor management (frequency = 7), uncompetitive pay (frequency = 6), lack of promotion (frequency = 5) and poor communication (frequency = 5). In comparison to this, important de-motivators according to Malaysian culture are lack of growth opportunities, insufficient salary, poor reward system, no involvement in decision making, stress, unrealistic or unachievable goals and poor management.

Thus, a clear deviation can be found between the importance of motivational and de-motivational aspects between Western and Malaysian cultures. This can be explained by the phenomenon that culture has an impact on the individual's characteristics and thus motivators and de-motivators will also vary, based on the characteristics of an individual, a link which was theoretically proved in [9].

## 6 Conclusion

Software engineering form a distinct group of profession and studies on motivators in software engineering are very few. This study tried to fill this gap by examining the motivators and de-motivators in the field of software engineering from Malaysian software engineer's perspective. Findings suggest that importance of motivators and de-motivators in software engineering field vary from one culture to another. Those motivators and de-motivators which are important for Western software engineers are not necessarily important for Malaysian software engineers.

Although this study gives us some hints about the variations in results from different parts of the world, results of this study cannot be generalized due to low sample size. Thus generalization should be applied after further verification of these results by conducting similar kind of study on a larger scale in Malaysia.

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