MOTIVATION OF EMPLOYEES IN SOFTWARE DEVELOPMENT PROCESS: A CASE OF PAKISTAN

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ABSTRACT: *This paper examines different motivational factors which can used to increase the motivation of employees working in software industry. With different other concepts, better skills of leaders can increase the productivity of employees. Skilled and dedicated leadership can set good values. Learning and mastering a variety of abilities facilitate leaders to spread and establish high standards in the organizations. In this research, questionnaire was developed and distributed to different people working in software industry. Data analysis was done through SPSS. The results were astonishing and all the variables have positive impact on motivation of employees working in software industry*

Keywords: Motivation, software industry, productivity

1: Introduction

Motivation is the driving force that causes the flux from desire to will in life[1]. From one of the classic theories about motivation in a development process by McConnell suggests that motivation itself is a soft-factor which cannot be quantified and often takes back seat to the factors less important and are easily quantifiable [2]. It also suggests that most organization do realize the importance of motivation, but hardly do anything about it, for such cases it is safe to suggest "Penny wise pound foolish". Along-side the facts mentioned earlier.

"The Standish Report [3]" suggests that having access to competent, hard-working and focused staff is one of the ten success criteria for software projects [4]. At last to conclude the classic theory of software motivation, "DeMarco& Lister's survey [5]" depicts that motivation was found to be one of the most cited causes of software project failures [6]. Software itself is the most complex creations of humanity itself so far. It is serious to an extent that that lives of many may depend upon it; simply we can conclude that the failure of the developed software might put a lot of lives at stake.

A software development process is the one to be known as people's process, as it is completely dependent upon the performance of the people [7]. For a software development starting from the requirements analysis to deployment of software deployment itself is a process of variables shifting along time simultaneously, thus resulting the effect in performance of the people either ways; excellent or poor. Demotivation of development team may result in privation of Retention, Productivity, Budgets, Absenteeism, Project Delivery Time, and Project Success [8-10]:

The motivators in software development are Good Management, Sense of Belonging, Rewards and Incentives, Feedback, Job Security, Good Work/Life Balance, Appropriate Working Conditions, Successful Company and Sufficient Resources [11-14].

Now it is clear enough to present the idea that it is the circumstances that get people made or broken, so to keep up the efficiency keep up the motivational level of the people.

2: Literature Review

Increasing the efficiency has always been a goal of every organization, weather scientific or non-scientific, also with prospect of scale whether large or small. Several hundred studies have shown that the equipmentcan only enhance productivity to an extent rest is purely dependent upon the moral or rather called motivational level of the employees in the organization.

2.1: Hawthorne Effect

Above concepts can be explained by the classical experimentation done by Elton Mayo [15, 16], and spanning over period of 8-years i.e. (1924-1932) at Hawthorne Works of Western Electric Company in Chicago. The out-come of theseexperimental periods came to be known as "Hawthorne Effect". The experiments were to demonstrate the effect of certain circumstances on the employee. The factor that was picked in the study was "Illumination" [17, 18]. Following were the results and immensely surprising these were:

- As illumination was increased, productivity went up
- As illumination was decreased, productivity went up
- As illumination was kept constant, productivity went up

These results made the authorities wanders that what were actually the reasons that were affecting the productivity of the production. The condition became enigmatic, which needed to be revealed. This led to the next phase to the experimentation in which 6 women were chosen from the relay assembly line. This group was isolated from rest of the factory workers and was put under supervision. For this particular group was put up with management style akin to leadership collaboration style.

This experiment was of great variation level compared to the one before. These variations were comprised of changes like reduction of work hours, increasing the length of work pauses throughout the day. Along with these variation the subject were kept well informed, also they were well heard by the experimenters and were involved as part of implementation of new variations.

As result the production went up. Eventually, all of these improvements were removed from the program. The

production was recoded highest at time. Stunning, it really was.

It was because of the utter dedication of the group to the experiment. The team had considerable amount of freedom of movement. Moreover they were not pushed by anyone and were considered in the decisions which affected the team. Experiment like this one was first of many which recognized the workplaces as social environments and also recognized the fact that it's not only the economical factor that can keep the employee motivated.

Recognition, security and sense of belonging were considered more important than the physical environment by Mayo. Also a friendly relationship with supervisor authorities was considered as an important factor to secure loyalty and cooperation with the team.

At same time theories like that of Taylor's Management System were highly considered compared to that of Mayo's, which pointed that highest motivational factor was wages [19-21].

Hawthorn's experiment was an inspiration to all the following experiments and theories which resulted in many useful conclusions. Though none of these have been successful enough to present a universal solution to the problem, faced by the industry regarding the employee moral level in relation to work optimization, though these theories have provided us with highly conclusive and productive results.

Two types of factors affecting these motivational levels are divided as [22]:-

- Ins-centric Factors
- Eccentric Factors

Intrinsic Factors

The factors that affect the employee from within the work itself and ambitions promised on organizational level [23].

Eccentric Factors

The factors that affect the employee from the factors that are comprised of the elements other than work itself, but the surrounding environment [22].

2.2: Boehm Motivational Theory

The first ten motivational factors for software developers in decreasing order of importance reported by Boehm are Achievement, Possibility for growth, Work itself, Recognition, Advancement, Technical supervision, Responsibility, Relations with peers, and Relations with subordinates and Salary [24-26]:

This list is based upon the research study of more than 25 years and has been applauded widely. Though looking at the theory depicts a strange scenario, of which first part is easily understandable that achievements being top motivator, but salary being the least motivator, which in today's scenario is considered among top ones in the list.

2.3: Good Management

Now days the projects are so complex that it is impossible to accomplish these tasks without great team collaboration [27]. This collaborative work is only possible when done under great management supervision. It took LaFasto 3 years to determine the characteristics of a successful team.

His findings were A clear, elevating goal, A results-driven structure, Competent team members, Unified commitment, A collaborative climate, Standards of excellence, External support and recognition and Principled leadership [28]. Thisproves that good management is directly connected with the motivation of workers.

2.4: Sense of Belonging

Sense of belonging means that an employee feels that he belongs to an organization. Felling that an employee is part of organization, to induce this feeling in employees an organization has to do a lot.

Organization has to give employee respect and their respective space to produce this type of feeling in their workers [29]. Organization has to show that the work being done by their employees is important and means something to the organization. Organization has to make their employees feel that they are needed and respected at their organization to produce sense of belonging in their employees, and when the organization has earned the loyalty of their employees then there is very less stopping from that organization from reaching excellence [30]. Perhaps the best example is of army, they make their employees feel respected and important to organization and that is why most soldiers go to extreme lengths to complete their respective tasks.

2.5: Rewards and Incentives

Reward and incentives is the reason for healthy competition between workers in any organization. These rewards are the reasons why an employee will want to increase their skills so that their work could improve and standout in their organization. Incentives is also the reason why employees especially at low level put in a lot of time and hard work because they now that if they do so they will not remain at the bottom for a long period of time and will reach higher ranks in the organization. Rewards and incentives are the driving force in any organization [31, 32].

2.6: Feedback

Taking feedback from the employees is very important for various reasons. During creative process if top management dictates the process, it will cause many problems in organization as well as in the process .On the other hand if they take feedback from their workers, it can improve the process and employees will feel proud [33, 34]. Hence increasing the productivity.

2.7: Job Security

Job security is also another important motivating factor for the employees. Employees want that their future should be secure in their organization. This factor will make them excel in their respective fields rather than spending time in perusing other job opportunities [35]. If an organization does not provide job security to their employees then that organization will have a major employee turnover which will directly impact the ongoing projects. So job security is crucial for growth of employees as well as for organization [35].

2.8: Successful Company

It is also a very important motivating factor in today's time. If an employee knows he is working in an important and successful company then morale of the employee will be high [36]. The employee will work hard and motivation level will be high.

2.9: Sufficient Resources

It means that the company is going to provide their workers with the required resources that they need to complete their work [3]. It is also another important motivating factor for their employees because they know that when any task will be given to them then they will be backed by their organizations [37].

2.10: Appropriate Working Condition

To make an employee remain committed to the organizational goals it is necessary that the appropriate working conditions are being provided. It is not only the salary that keeps the employee committed to the task, but after reaching at a point it takes a lot more than just that [38]. Most of all it is to make the employee realize that he/she does have a value of their own and the organization is just for them; not the other way around. To make achieve this level of realization, discipline of the organization is the utmost necessity [39]. The organizational discipline is applied to all the aspects of the organization. This includes the availability of appropriate hygiene conditions of the workspace [40, 41].

If it is considered by the managers that the issues are heating up to be resolved by themselves, then it becomes responsibility of the higher authority to intervene and resolve the issue before the efficiency of the other team members is affected. The workloads assigned to the employees should be manageable; as an individual has a limit to the work output. Assigning tiring loads of work might backfire and result in increased absenteeism or worse.

Appropriate working conditions also comprises of managing of an environment that if free of biasness based upon favoritism, gender or creed differences.

Finally, it comes down to the safety of the working environment itself, for that it should be made sure that every possible emergency scenario is properly studied both from the experience of past & and from the similar cases of other organizational structures. Again this is very much factor to realize employee that some one is there who is caring for him/her. The next section of the paper is about theoretical frame work, hypothesis, research methodology and results of the paper.
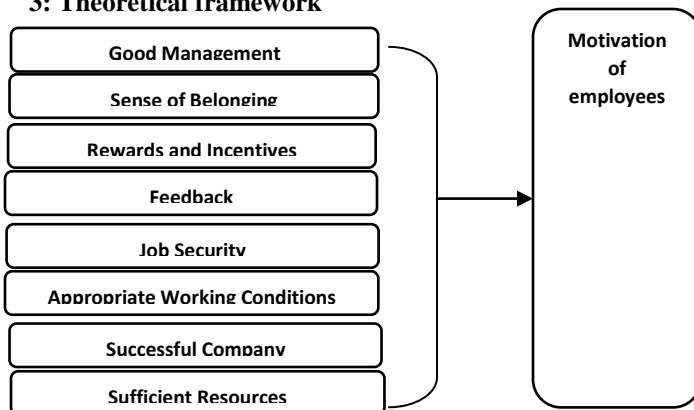
3: Theoretical framework

Figure 1

4: Hypothesis

H1: Good Management increases motivation level of employees.
H2: Sense of Belonging is factor which increases motivation of employees.
H3: Rewards and Incentives increase motivation of employees.
H4: Feedback increases motivation of employees workinh in the organization.
H5: Job Security enhances motivation of employees
H6: Successful Company improves motivation of employees
H7: Appropriate Working Conditions increases motivation of employees
H8: Sufficient Resources in the organization improve motivation of employees

5: RESEARCH METHODOLOGY

The research questions were examined from the individuals who provided information. Questionnaires were used as a secondary source of data collection. As with the help of questionnaires, it is very easy to gain data efficiently for research purpose.

In this paper questionnaire were administered personally and distributed through web among the general public who are working in different organizations to collect data.

The survey is confined to all over Pakistani organizations and responses completed within a short period of period.

5.1: Sampling size

It is a method of choosing elements from a big population. So that a learning of the sample and an understanding of its characteristics would make it

Probable for us to simplify such properties or characteristics to the population elements. The number

of members surveyed is n=126.

5.2: Sampling procedure

In our research, sample area is Pakistan where we administered our questionnaires to make our sample size more appropriate in understanding the impact of leadership on the productivity of employees.

Simple random sampling technique is used in this paper. Precision and confidence are important issue in sampling because when we use sample data to draw inferences about the population, we hope to be fairly "on target", and have some idea of the extent of possible error. Because a point estimate provides no measure of possible error, we do interval estimation to ensure a relatively accurate estimation of the population parameter.

6: RESULTS AND DISCUSSION

6.1: Checking the Reliability of measures: Cronbach's Alpha:

The interim consistency reliability or the Cronbach's Alpha reliability coefficients of the eight independent variables (Good Management, Sense of Belonging, Reward and Incentive, Feedback, Job Security, Appropriate Working Condition, Successful Company, Sufficient Resources) and one dependent variable (Motivation of employees) were obtained in table 1. The results in table 1 indicate that the Cronbach's Alpha for the 9-item measure is 0.902.

The closer the reliability coefficient to $\acute{\alpha}$ 1.0 the better the results are. It shows that the data collected through questionnaire is reliable as value is above 0.7 and if the value of Cronbach's Alpha is above 0.7 then it means that the data is consistent and we can rely on collected data and the data can be used for further analysis.

Table 1: Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	**N of Items**
.902	**9**

The Pearson Correlation Matrix is attained for the nine interval-scaled variables as revealed in table 3. From the results, we find that motivation of employees is positively correlated with all the independent variables, but the contribution of Successful Company is more than any other variable. The significance value is below than 0.05 in all the cases.

6.2: Descriptive Statistics: Measuring Mean and Standard deviation

Descriptive Statistics such as means and standard deviations were investigated for the interval-scaled independent and dependent variables as mentioned in table 2. The results in table 2 (5-point scales) were tapped on the variables, the mean for motivation of employees is 3.87, Good Management shows 3.71, Sense of Belonging shows 3.83, Reward and Incentive shows 4.01, Feedback has the value 4.00, Job security has 3.94, Appropriate Working Conditions has 3.79, Successful Company shows 3.87 and Sufficient Resources has the value 3.93.

So, this research shows that data is more reliable and consistent to (4th scale) i.e. **agreed** by respondents in an average. Standard deviation is near to 1.0 in all the cases. So it shows strong impact on motivation of employees.

Table 2 Descriptive Statistics

Descriptive Statistics			
	Mean	**Std.**	**N**
Motivation	3.87	.968	126
Good Management	3.71	1.233	126
Sense of Belonging	3.83	1.121	126
Reward and Incentive	4.01	1.043	126
Feedback	4.00	1.042	126
Job Security	3.94	1.084	126
Appropriate Working	3.79	1.062	126
Successful Company	3.87	1.046	126
Sufficient Resources	3.93	1.066	126

6.3: Inferential Statistics: Pearson Correlation

The Pearson Correlation Matrix is attained for the nine interval-scaled variables as revealed in table 3. From the results, we find that motivation of employees   is positively correlated with all the independent variables, but the contribution of Successful Company is more than any

other variable. The significance value is below than 0.05 in all the cases.

Table 3 Pearson Correlation

		Motivation of Employees	Significance
Pearson Correlation	**Motivation of Employees**	1.000	
	Good Management	.701	000
	Sense of Belonging	.749	000
	Reward and Incentive	.691	000
	Feedback	.692	000
	Job Security	.703	000
	Appropriate Working Condition	.784	000
	Successful Company	.809	000
	Sufficient Resources	.766	000

6.4: Multiple Regression Analysis

The tabl*e* 4 lists the eight autonomous variables which are put into the Regression Model and **R** (0.895) is the correlation of the eight independent variables with the dependent variable, after all the inter correlations amongst the eight independent variables are taken into account. In the Model Summary in table 4, the **R Square** (.0.802), which is explained variance, is in fact the square of the multiple R (.0.895)².

In table 4 the value of R 0.895 (89.5%) shows that 89.5% of the dependent variable i.e.; motivation of employees can be explained with its eight independent variables (Good Management, Sense of Belonging, Reward and Incentive, Feedback, Job Security, Appropriate Working Condition, Successful Company and Sufficient resources). The value of R square is 0.802 or 80.2% which shows the significant contribution of eight independent variables towards dependent variables i.e.; motivation of employees.

Table 4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.895a	.802	.788	.446

6.5: ANOVA

From the ANOVA table we conclude that our model is goodness of fit because the significant value is .000. If the significant value is less than the level of significance (0.05) its shows the model is goodness of fit. It also shows that at least one the coefficient is not zero**.**

Table 5 ANOVA

ANOVA[b]					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	93.885	8	11.736	59.097	.000a
Residual	23.234	117	.199		
Total	117.120	125			

6.6: Coefficients

ANOVA table tells us about the goodness of fit but coefficient table tells individual contribution of every variable. From the Coefficients table, every variable is contributing towards motivation of employees.

Table 6 Coefficients

Model	Standardized Coefficients		
	Beta	t	Sig.
1 (Constant)		2.043	.043
Good Management	.207	3.324	.001
Sense of Belonging	.058	.760	.449
Reward and Incentive	.006	.085	.933
Feedback	.020	-.266	.790
Job Security	.064	-.874	.384
Appropriate Working Condition	.236	3.172	.002
Successful Company	.390	5.193	.000
Sufficient Resources	.217	3.006	.003

7: RESULTS

From the Correlation table, we conclude that our independent variables i.e.; Good Management, Sense of Belonging, Reward and Incentive, Feedback, Job Security, Appropriate Working Condition, Successful Company and Sufficient resources are all positively correlated with the dependent variable i.e.; motivation of Employees, Our all hypothesis have been accepted as the significance value of independent variables is less than 0.05.

So its means that all the independent variables which have been proposed in this paper are necessary to increase the motivation of employees.

8: CONCLUSION

The objective of writing this paper was to discuss the motivation and which factors are responsible for increasing the motivation of employees. A survey was conducted with a sample size of 126. Results show that all the independent variables are positively contributing towards motivation of employees. So it has been proved that in order to increase of motivation of employees working in software industry, all the mentioned variables must be provided to the employees. Good motivation level increases the productivity of employees and hence increases resoures of the organization. In case of software development efforts, this is more important as software workers often work in burnout mode.

9: Limitations

The limitations of this study are that we are only covering organizations in Pakistan. The sample size may be on the lower side, it is possible that if there is large sample size, results would be clearer and specified and at the same time there is also shortage of time as well.

10: Future Work and Suggestions

This research is confined to Pakistan only. In future we can expand our research internationally and can make assessment on how to increase the productivity of employees. At the same we can expand the base of independent variables to judge and to increase the productivity of employees.

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