BUSINESS EXCELLENCE THROUGH INTEGRATION OF TQM AND HRM

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ABSTRACT

Purpose – This paper seeks to examine employees' perceptions of business excellence or High Performance Work System (HPWS) and its relationship with TQM/HRM practices within software industry in India. Despite extensive research on TQM/HRM practices and HPWS, none examines this scope of investigative study. Therefore, the proposed model was developed with the intention of examining this relationship.

Design/methodology/approach – Original research using self-completed questionnaires, distributed to employees of software industry, is thoroughly reported. The study sample consisted of 324 employees, resulting in a response rate of 81 percent. A questionnaire was developed and administered to ascertain the level of influence by TQM/HRM practices on HPWS. Data were analyzed by employing correlation.

Findings – The results revealed that HRM, organization culture, quality of work life, empowerment are high involvement TQM/HRM practices which are positively associated with employees perceptual outcomes and process quality management, benchmarking and others are low involvement TQM/HRM practices which are required for the cost efficiencies and operative outcomes of HPWS. Further, the result of the analysis supports the proposed model based on the empirically validated TQM/HRM instruments, which are reliable and valid.

Originality/value – The findings make a significant contribution by using software industry that proves to be useful as an example of a methodology that might be used to track the extent of TQM/HRM effects on HPWS. An organization could use this instrument to do a pre-test baseline measurement, and then periodically re-administer it to identify changes associated with TQM/HRM efforts.

Keywords-Total quality management, Human Resource Management, High Performance Work System, software industry.

I. INTRODUCTION

The relationship between TQM and HRM in relation with business excellence or performance of the organization is the concerned area for many researchers. There are many theories and researches, which explain this relationship and provide the practices, which are relevant for high performance work systems or business excellence. In the TQM literature there are some common practices described by many authors that contribute and leads to the business excellence. Dale (1999) explains that following TQM practices leads to the organizational excellence: leadership, training, involvement and participation of employees, co-operation and customer focus. These practices can also be described as HRM practices or activities. A part from that various researchers explicitly described the best practices for High Performance Work Systems or business excellence. Pfeffer (1994) describes 16 'high performance practices for high performance work systems. 'Information', 'high wages', job security, motivated and flexible work force are amongst them. While Arther (1994) stresses on other practices like decentralization, participative leadership and excellent wages. Dalery and shaw (2002) states that a proper mixing and application of best practices as staffing, appraisal, compensation and job design will leads to high performance work systems (see figure 1). The high performance work system models described in relation to international quality standards (like ISO, CMM, Six sigma etc.) developed best practices from TQM point of view (Blackburn and Rosen, 1993; Puay et al, 1998). Thus it is clear that TQM and HRM both are very much required for business excellence or high performance work systems.

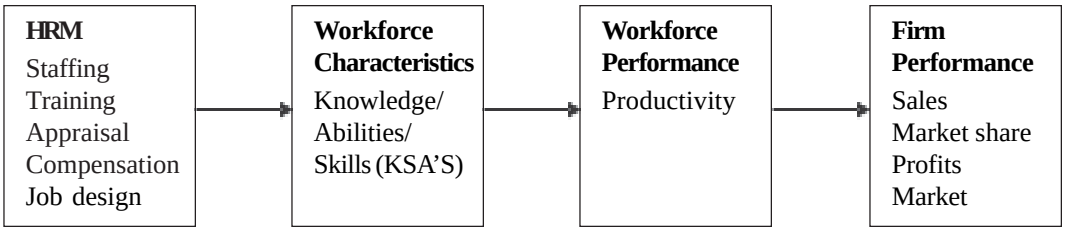

Figure 1: Theoretical Model

But, previous studies link the TQM/HRM with HPWS have had limited outcome in scope and also have methodological constrains. Most of the previous studies are theoretical in nature. In order to overcome mentioned limitations this study contributes to literature by attempting the clear need of an analytical study that examines the elements of TQM/HRM and linking them with HPWS using the appropriate statistical methods with in the Indian software industry.

In view of the absence of such research on these relationships, therefore, this paper reports the results of a survey that was designed to address these research questions :

(1) What essential TQM/HRM practices should be developed that would lead to HPWS?

(2) Is there any difference between the types of TQM/HRM practices, which lead to HPWS?

(3) Which of the HRM outcomes are closely related to HPWS?

(4) Does the perceptions of employees towards TQM/HRM practices affect HPWS?

(5) To what extent are the effects of TQM/HRM practices visible on HPWS and HRM outcomes?

This research explores the degree of impact, the implementation of TQM/HRM practices poses to benefit the employees within software industry in India, and further measuring the relationship between TQM/HRM practices and High Performance Work Systems, apart from identifying problem areas, their possible remedies respectively and also prominent improvements.

The purpose of this investigation is four-fold. Firstly, to identify a set of TQM/HRM principles that would prove to be an effective guide in the implementation of HPWS. Secondly, to present a model as a systematic way to measure the extent of impact employees' perceptions have in relation to the implementation of TQM /HRM practices on HPWS. Thirdly, it is to explore the relationship between TQM/HRM practices and HPWS and lastly, to assess which TQM/HRM practice is strongly associated with HPWS?

II. CONCEPTUAL MODEL FOR RESEARCH

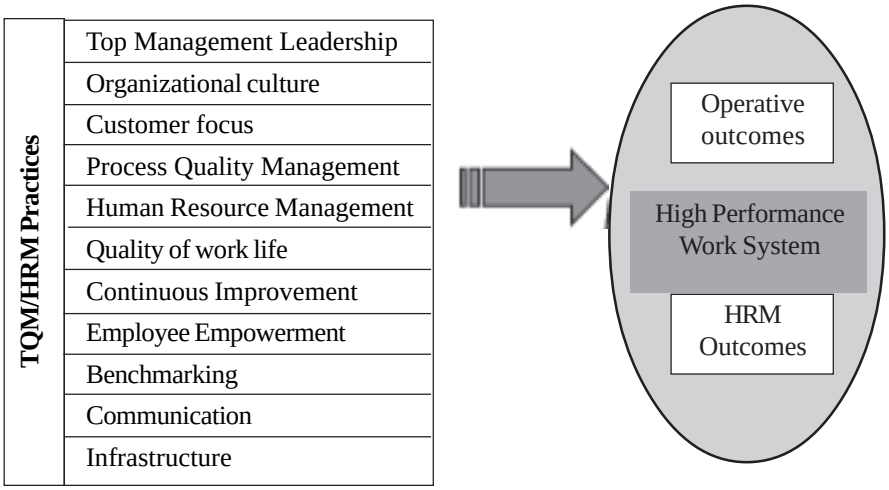

Figure 2: Conceptual model

The conceptual schema of this study focuses on the development of a theoretical HPWS model as a systematic way in implementing TQM/HRM practices within software industry in India. Examining the relationship between TQM/HRM practices and HPWS should contribute to our knowledge of the complexity of the relationship that exist between them.

The link between TQM/HRM practices and HPWS is illustrated in Figure 2. In this theoretical framework, TQM/HRM practices are independent variables and HRM outcomes and operative outcomes are dependent variables, which are the part of HPWS. The present study thus attempts to bridge the gap by providing a basis for a thorough and insightful discernment of TQM/HRM practices and HPWS.

III. HYPOTHESIS

Based on the extensive study of previous research, it would therefore suggest that TQM/HRM practices improve HRM outcomes and operative outcomes. As such, the following hypothesis are proposed:

H1. TQM/HRM practices are positively associated with operative outcomes within software industry.

H2. TQM/HRM practices are positively associated with HRM outcomes within software industry.

IV. METHDOLOGY

Sample and procedures

An initial list of constructs was prepared through literature survey and it was sent to the software engineers and academicians to verify it. They evaluate the list and also assess the relevance, understandability, clarity, and unambiguity of the questions. This ensures the validity of the questionnaire.

Data were collected from employees of various software organizations in India. The Companies were selected from the member list of NASSCOM.

The questionnaire survey was done for data collection. The questionnaires were sent to software developers and their managers who have more than 2 years of experience to 100 development centers of different software firms. They were sent through email or distributed through HR manager. Out of the 400 questionnaires sent, 324 questionnaires were returned, yielding a response rate of 81 percent, which is considered acceptable.

Variable measurements

Independent variables:

TQM/HRM practices. A total of 45 questions captured the 11 TQM/HRM variables under investigation. The questionnaires on TQMHRM dimensions were grouped into 11 elements; namely, Top management leadership, Organizational culture, Customer focus, Process Quality Management, Quality of work life, Continuous Improvement, Human resource management, Employee Empowerment, Benchmarking, Communication. The importance of the 11 constructs of TQM/HRM practices are described below:

(1) Top-Management Leadership (TML): The leadership of top management is very important and in central to the implementation of a TQM/HRM practices in any organization. Many researchers states that the quality improvement efforts in any organization should start from the top and flows down to the lower level.

(2) Organizational Culture (OC): Quality cannot be achieved without the cooperation and coordination of everyone in the organization. A proper atmosphere should be created in the organization to imbibe and cultivate an organizational culture, which builds up the commitment of everyone to quality (Tenner 1991).

(3) Customer Focus (CF): Many studies agree on what quality means, satisfaction of customer requirements. Customer focus leads to improved quality irrespective of anything. So, understanding of the client's requirements and maximizing his satisfaction are critical in the software industry also. The requirements of the customers (internal and/or external) should be satisfied at each stage of software development.

(4) Process Quality Management (PQM): Quality performance depends on process management, measurement and analysis of data, and leadership. So, the quality of processes needs to be improved continuously for improving the quality of the product. "Process" is a key factor in software development. Improvement of processes helps to reduce the effort, development time, and defects in software (Jalote 2000).

(5) Human Resource Management (HRM): Based on an empirical study, Paul and Anantharaman (2002) said that there is a positive relationship between human resources practices and organizational performance. The authors further

states that there is a significant difference in human resources practices across multinational and Indian software companies. Thus, it is evident that human resources practices are critical in software firms.

(a) Reward and recognition: This can be defined as monetary and nonmonetary benefits, such as increased salary, bonuses and promotion resulting from the review of performance, which is gave public acknowledgement of superior performance.

(b) Recruitment, selection, and retention: Recruitment, selection, and retention of employees with required skills are very important for any organization. The ability of the employee to develop as a member of the team as well as the organization is another important factor in the case of software industry. Employee turnover is a major issue faced by software companies that should be minimized.

(c) Training and development: Training brings about changes in knowledge, skills, attitudes, and social behavior of employees for doing a particular job, and it is a vital in continuous improvement. Training also helps to improve employee participation and involvement in quality programs by providing required knowledge and skills to them.

(d) Teamwork: Teamwork is an important tool associated with quality management. Most of the software projects involve the combined efforts of a number of people across various departments in the organization. Therefore, the success of a project depends on interdependence and coordination among the team members in a software firm.

(6) Quality of Work life (QWL): An essential factor that decides the effectiveness of software employees is "conducive work environment." Quality of work life is the general atmosphere and human relations at the workplace.

(7) Employee Empowerment (EE): Empowerment means the assigning of responsibility with authority to the employees. High performance and high commitment require high levels of employee empowerment can be successfully used to transform organizations. Freedom for all team members to make suggestions during software development or project execution is a good practice for improving the software quality.

(8) Continuous Improvement (CI): According to the TQM philosophy, the key to quality is satisfying the needs and expectations of the customer through a system wide continuous improvement strategy (Goyal and Islam 2001; Ahmed 2001). Therefore, superior quality demands the propagation of a culture of continuous improvement, driven by measurement and improvement (Lewis 1999).

(9) Benchmarking (BM): Benchmarking is a term used to describe activities that are aimed to make comparisons against the best practices. Benchmarking is a common element of TQM implementation, irrespective of the nature of the organization (Zinovy et al. 1996). In the IT industry, the common benchmark themes are expenditures, operations, helpdesk activities, programming effectiveness, and efficiency (Cortada 1995).

(10) Infrastructure and Facilities (IF): Infrastructure becomes very critical in the case of software companies, where technological advancement is rapid and its adaptation is compulsory for survival. The term "facilities" also includes sufficient conference rooms; training areas; physical resources such as furniture, computers, and application software; and communication technologies such as telephone, fax, and e-mail (Bahrami and Evans 1997).

(11) Communication (COM): Communication helps to provide better control of processes, which in turn helps to improve quality. Communication helps to provide clarity of roles and responsibilities of each employee. Communication helps to improve quality through customer satisfaction by providing better service and quicker response to queries (Cortada 1995) opportunities. The internal consistency reliability coefficient for the scale is 0.79.Prepare

Dependent variables:

High Performance Work Systems (HPWS). HPWS include two elements, namely HRM outcomes and operative outcomes.

(1) HRM outcomes: This includes the HR performance of the system. This can be divided in two:

(a) *Perception HRM outcomes*; e.g. employee satisfaction, employee motivation, employee trust, employee commitment, and employee loyalty.

(b) *Objective HRM outcomes*; e.g. employee turnover rate and absenteeism rate.

(2) Operative Outcomes: This includes the productivity of the system. This includes:

(a) *Product Attributes (PA):* The quality of software is estimated by many of its attributes such as reliability, integrity, maintainability, enhanceability (extensibility), usability, portability, and reusability. They affect the customer satisfaction so these can be treated as the indicator of quality product.

(b) Return on Quality (ROQ): The returns (benefits) of quality implementation are measured by performance indicators such as the reduction of errors, better process management, decrease in production costs, decrease in rejects and wastage, reduction in rework, and decrease in customer complaints (Radovilsky and Gotcher 1996).

Measure	Items	Factor loading	KMO	Eigenvalue	Variance explained (%)	Reliability
Independent variables						
Top-Management Leadership	3	0.598-0.718	0.85	2.69	53.77	0.74
Employee Empowerment	4	0.531-0.955				0.70
Organizational culture	7	0.516-0.803				0.72
Communication	4	0.701-0.795				0.83
Customer Focus	4	0.510-0.755				0.80
Process Quality Management	4	0.588-0.728				0.83
Human Resource Management	8	0.541-0.955				0.76
Quality of Work life	4	0.516-0.813				0.76
Infrastructure and Facilities	3	0.703-0.796				0.81
Benchmarking	3	0.520-0.755				0.73
Continuous Improvement (CI)	3	0.599-0.718				0.74
Dependent variable						
HRM outcomes	5	0.653-0.797	0.84	2.34	46.47	0.79
Operative outcomes	5	0.721-0.794				0.82

V. ANALYSIS OF DATA

The statistical computer program used for the questionnaires data analysis was SPSS 11.0. Correlation studies were used to determine the relationship between the dependent and independent variables. TQM/HRM practices were regressed against HPWS. The multiple regression analyses confirmed the significance of the independent and dependent variables.

A. Result of Surveys

Factor analysis and scale reliabilities:

Table I. Factor analysis and scale reliabilities – independent variables

Note: n =324

A principal component factor analysis with varimax rotation was conducted to validate the TQM /HRM practices (Table I). In interpretation, only a loading of 0.5 or greater on the factor and 0.35 or lower on the other factors is considered. Varimax rotated analysis showed the existence of 11 significant factors with eigenvalues (i.e. 2.69) greater than one that explained 53.79 percent of the variance. The KMO sampling adequacy test has 0.85 value for each item with sufficient intercorrelations with the Bartlett's test of spehericity was also found significant (Chi-square = 472:06, p , 0.001). Thus, the factors are considered adequate because they are less than 60 percent of the variance recommended in social sciences (Hair et al., 1998). The results of the factor analysis represented in Table I.

Similarly, another factor analysis was done to check the dimensionality of the dependent variables. The two factor analysis with eigenvalue of 2.34 showing 46.45 percent of variance in the data. The KMO measure of sampling adequacy was 0.84 indicating sufficient intercorrelations, while the Bartlett's test of sphericity was significant (Chi-square = 339:92, p, 0:01).

The reliability of the questionnaire was tested by Cronbach alpha. The reliability coefficient (alpha) of each element of TQM/HRM practices was as follows: top management leadership (74 percent), employee empowerment (70 percent), organization culture (72 percent), communication (83 percent), process quality management (83 percent), human resource management (76 percent), quality of work life (76 percent), infrastructure and facilities (81 percent), benchmarking (73 percent), and for continuous improvement (74 percent). The reliability for dependent variables i.e. HRM outcomes is (79 percent) and for operative outcome is (82 percent). The reliability coefficients of all the five elements of TQM were above 0.70, which concurs with the suggestion made by Nunnally (1978).

B. Descriptive Statistical Analysis

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
TML	3.76	0.55											
EE	3.92	0.61	0.53*										
OC	3.93	0.58	0.49 *	0.56 *									
Com	3.89	0.62	0.54 *	0.61 *	0.67*								
CF	3.74	0.57	0.42*	0.36 *	0.53*	0.62*							
PQM	3.70	0.58	0.41*	0.46 *	0.47 *	0.57*	0.57 *						
HRM	3.95	0.52	0.53*	0.65*	0.66*	0.57*	0.65*	0.63*					
QWL	3.90	0.55	0.49 *	0.56 *	0.54*	0.49*	0.57*	0.59*	0.60*				
I&F	3.69	0.56	0.54 *	0.61 *	0.67*	0.57*	0.56*	0.54*	0.54*	0.58*			
BM	3.67	0.61	0.42*	0.36 *	0.53*	0.62*	0.62*	0.59*	0.56*	0.60*	0.58*		
CI	3.74	0.59	0.41*	0.46 *	0.47 *	0.57*	0.57 *	0.56*	0.60*	0.61*	0.58*	0.55*	
HRM O	3.90	0.55	0.52*	0.70*	0.72*	0.68*	0.54*	0.46*	0.76*	0.60*	0.42*	0.44*	0.55*
OO	3.76	0.52	0.46*	0.66*	0.65*	0.57*	0.60*	0.67*	0.70*	0.57*	0.50*	0.60*	0.58*

Notes: n = 324; *Correlation is significant at p, 0.01 level (2-tailed)

Table II. Correlations of TQM/HRM practices and HPWS

The correlation matrix in Table II further indicates that TQM/HRM practices were positively, moderately and low correlated with HPWS. There was a significant positive relationship between HRM and HRM outcomes (r = 0.76, n = 324, p, 0:01), organization culture and HRM outcomes(r = 0.72, n = 324, p, 0:01), employee empowerment and HRM outcomes(r = 0.70, n = 324, p, 0:01), communication and HRM outcomes (r = 0.68, n = 324, p, 0:01) and quality of work life and HRM outcomes (r = 0.60, n = 324, p, 0:01). The positively moderate correlation was for continuous improvement and HRM outcome (r = 0.55, n = 324, p, 0:01), customer focus and HRM outcome (r = 0.54, n = 324, p, 0:01) and between top management leadership and HRM outcome (r = 0.52, n = 324, p, 0:01). The weakest correlation was for process quality improvement and HRM outcome (r = 0.46, n = 324, p, 0:01), benchmarking and HRM outcome (r = 0.44, n = 324, p, 0:01) and between infrastructure and facilities and HRM outcomes (r = 0.42, n = 324, p, 0:01).

While when we consider the correlations between TQM/HRM practices and operative outcomes (indicated in table 2) we find that there is a significant positive relationship between process quality improvement and operative outcome (r = 0.67, n = 324, p, 0:01), benchmarking and operative outcome (r = 0.60, n = 324, p, 0:01), continuous improvement and operative outcome (r = 0.58, n = 324, p, 0:01) and customer focus and operative outcome (r = 0.60, n = 324, p, 0:01) also along with the HRM and operative outcome (r = 0.70, n = 324, p, 0:01)organization culture and operative outcomes(r = 0.66, n = 324, p, 0:01), employee empowerment and operative outcomes(r = 0.65, n = 324, p, 0:01), communication and operative outcomes (r = 0.57, n = 324, p, 0:01). The positively moderate relationship was found between top management leadership and operative outcome (r = 0.46, n = 324, p, 0:01), and between infrastructure and facilities and operative outcomes (r = 0.50, n = 324, p, 0:01).

The correlation coefficients between the independent variables (i.e. TQM/HRM practices) and the dependent variable (i.e. HRM outcomes and operative outcomes) were less than 0.9, indicating that the data was not affected by a collinearity problem (Hair et al., 1998). These correlations are also further evidence of validity and reliability of measurement scales used in this research (Barclay et al., 1995; Hair et al., 1998). The results indicate that the most important TQM/HRM practice affecting HRM outcomes were HRM and employee empowerment (i.e. with the highest scores of correlation), which proves that HRM and empowerment were perceived as a dominant TQM/HRM practices, which improves HRM outcomes. But when we consider operative outcomes other practices, as process quality improvement is also very important.

VI. DISCUSSION

The overall objective of this study was to investigate the relationship between TQM/HRM practices and HPWS within software industry. The results of this study revealed that the TQM/HRM practices could be categorized into three categories:

1. High Involvement TQM/HRM practices: e.g. HRM, empowerment, quality of work life, communication and organization culture with highest mean and correlation coefficient.
2. Moderate involvement TQM/HRM practices: e.g. continuous improvement, customer focus and top management leadership with moderate mean and correlation coefficient.
3. Low involvement TQM/HRM practices: e.g. benchmarking, infrastructure and facilities and process quality management with weakest mean and correlation coefficient.

In the contemporary HRM-business performance literature, high involvement work practices are typically measured by indexes that incorporate, or assign points to the extent of team-based work and/or other employee participation arrangements, employee training and development, formal performance management systems, variable pay, business information sharing with employees, targeted or selective recruitment and hiring, and certain other practices. Those entities –companies, service work groups -with high index scores can be said to practice what might be called "high high involvement" HRM; those entities with midlevel index scores can be said to practice what might be called "average high involvement" HRM; and those entities with low index scores can be said to practice what might be called "low high involvement" HRM. (lewin 2004).

The results show that there is a strong relationship between high involvement TQM/HRM practices and HRM outcomes. This provides the evidence to lewin and other researchers who states that high involvement practices are required for HPWS and leads to business excellence.

In contrast, there was a weak relationship between low involvement practices and HRM outcomes. Low involvement practices were found to have insignificant contributions towards HRM outcomes.

But, there is a significant and strong relationship is found between low involvement practices and operative outcomes. The result supports the findings from lewin (2004), in which he found there is a significant relationship between the low involvement practices and business performance which is the called as 'dual theory of business performance'. (lewin 2004).

The dual theory of business performance states that "high involvement" type HRM (HIHRM) practices has significant positive effects on such business performance measures as market value, rate of return on capital employed, revenue growth, revenue per employee, productivity, product/service quality, and even organizational survival (see Lewin, 2004). That HIHRM practices "leverage" business performance appears to be well known to human resource (HR) executives.

HIHRM practices, however, constitute only one way of managing human resources to leverage business performance. Another way to achieve more business performance is by managing human resources by expense control. Consequently, certain "low involvement" HRM (LIHRM) practices may best fit some organizations and employees. Taken together, HIHRM and LIHRM practices form the building blocks for a dual theory of HRM and business performance (lewin 2004).

VII. PROPOSED MODEL

On the basis of the findings from the study and lewin's dual theory we propose a model for HPWS.

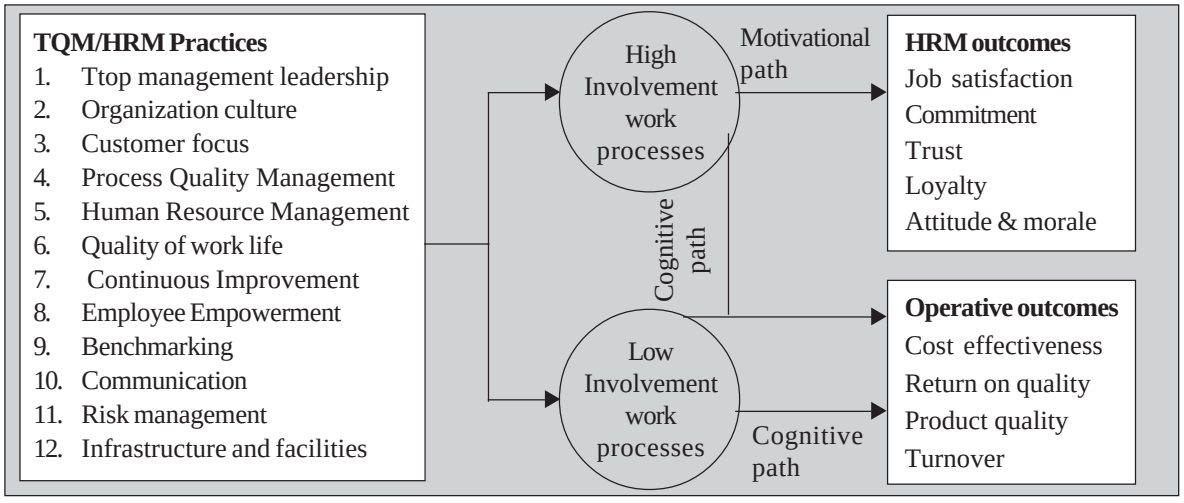

Figure 3. High Performance Work System

Figure 3 linked TQM/HRM practices to involvement processes and thence to worker psychological states, which leads to HR outcomes and measures of organisational effectiveness i.e. operative outcome. It proposes two paths: a cognitive path in which high-involvement processes take 'greater advantage of the skills and abilities' employees possess and a motivational path in which involvement processes increase HR outcomes (satisfaction, commitment etc.). This parallels Batt's (2002) identification of a 'direct' path (enhancing employee skill levels and firm-specific knowledge) (Boxall and Macky 2009) and an 'indirect' path (enhancing employee motivation and satisfaction, and lowering quit rates). The direct path, which includes low involvement processes, is important for enabling workers (individually and collectively) to solve work problems more effectively, and that leads to better operative outcome of the companies, and the indirect path is important to ensuring they want to do so and continue to take responsibility for doing so...

In other words, high-involvement work processes empower workers and positively affect job satisfaction, trust, commitment and employee loyalty. It also reduces the employee turnover and absenteeism. While low involvement work practices are related to motivational path only and give the cost advantages and enhance knowledge and employee abilities, motivations and opportunities to contribute. Improvements in knowledge enhance ability, while empowerment and information enhance the opportunity to contribute.

The kind of framework shown in Figure 3 takes us in a simple but important way beyond the counting of HR practices. It means that we are not restricted to understanding TQM only through certain specific practices. It measures each process dimension in relation to the HRM framework. Such a procedure measures the systemic impact of these processes on employee attitudes and organisational effectiveness. It is found that high-involvement processes do act positively through both (indirect) motivational and (direct) cognitive paths. Company performance is higher (measured by higher ROE and lower employee turnover), as is employee morale. It ensures that processes *as experienced by employees* are measured in the space between management.

A sustainable high involvement work practices also benefit firms or economically rational managers will shut down operations or relocate operations. Because, the value to firms is best demonstrated by the benefits and costs at the point of production (*i.e.* operational outcomes of an actual production process) and the proposed model measures the cost involved, ROE and other operative outcomes. So, the proposed model also measure that processes, which are beneficial, form the employer side.

VIII. CONCLUSIONS, IMPLICATIONS AND RESEARCH LIMITATIONS

Like others, we found the difficulties in specifying the independent variable in HPWSs. The term itself gives no clue about the pathway of the desired goal. The linkage of HPWS and high involvement employment practices (lewin 2004), are both more descriptive, more useful in identifying the main thrusts in a particular HR system. However, they are not equivalent. While higher involvement typically implies higher skill and is more rationally managed with high-involvement practices, but, the reverse is not always true.

The study of HIWSs has logical focus because it creates smarter working, to gain competitive advantage globalised software industries, are of vital interest to practitioners and policy makers in the developed economies. As the studies of MacDuffie (1995) and Appelbaum *et al.* (2000) states that the competitive response requires change to work systems. This study provides a theoretical rationale for particular practices by accompanying quality framework.

Focusing our independent variable on high-involvement work and linking it with TQM/HRM improve our theoretical modeling and practical measurements and will help to progress the evaluation in this area. The HIWSs implies that there are possibilities for win–win outcomes in certain contexts but not without careful management of both types of practices. On the employee's side, the high involvement practices provides motivation to them and leads to high HR outcomes in the form of better job satisfaction and high moral and less turnover. But on the other side low involvement practices required for the cost efficiency and better operative outcomes. However, the interaction between involvement and intensification is very critical. On the company's side, the caution should be taken with overgeneralised claims of economic benefits. This study will help us to know that *when* and *how* a high involvement system might perform, thus helping us with the contextual and causal questions that is the central to this line of research.

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