Is IT Industry Productive: A Performance Based Investigation of IT Sector Firms Operating in Pakistan

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Abstract

This paper investigates the effect of eleven independent variables as subsets of Employee Orientation, Environment and Organizational System, on the overall performance of the IT sector firms, operating in the area of Islamabad, Pakistan. Variables are investigated by targeting a sample of 15 leading IT sector firms. A total of 225 questionnaires were distributed. The Cronbach's Alpha for the questionnaire resulted in a score of 0.8398. Extensive analysis after the application of multiple regression analysis revealed that, there is an overall average level of relationship between the variables considered. IT sector has shown tremendous progress.

Keywords: Organizational performance, Employee orientation, Environment, Organizational system, Industry

1. Introduction

Productivity of the organizations operating in the industry usually defines the overall performance of the industry in true letter and sprit. Researchers have comprehensively evaluated and analyzed the subject of productivity in terms of performance related to operations of the firms within the concerned industries. The definition of productivity in the context of our study is usually defined as a performance measure that indicates how effectively an organization converts its resources into its desired products or services. It is a relative measure and it is used to compare the effectiveness of a country, organization, department, workstation or individual over a certain time period (Internet, Answers Search Engine, 02nd, September 2007). Productivity is generally measured by the ratio of inputs to outputs produced efficiently and effectively with in the given timeframe where, factors affecting productivity may range from categories like; product, process, labor force, capacity, external influences, to quality, but this study encompasses a different angle of performance evaluation of IT sector firms operating in Pakistan. Here the main objective is to investigate the true association of factors taken as independent variables with the dependent variable which are further explained in detail in this study. These factors are associated with three broad categories which are; employee orientation, Industrial environment and organizational system, which are considered as the pillars on which performance of an organization can be measured and once the performance of a significant number of firms from the selected sample are recorded, the overall performance in terms of productivity of the IT industry can be estimated and compared with the published growth statistics by an authenticated publishing source in the country. The focus of this research study is the Information Technology Industry of Pakistan.

In Pakistan the IT industry is comparatively new and initiated its operations bit late as compared to her neighboring country India, which is said to be 15 years ahead of us. In spite of this latency the IT industry of Pakistan has progressed at a remarkable pace. These days IT industry is one of the most progressing and dynamic sectors in the country. Almost all the leading world IT companies have their branches in Pakistan and this shows the strength of IT industry in Pakistan. According to the statistics presented in Pakistan Software Export Board, press release, 3rd may (2007), showed that, in IT industry of Pakistan the revenue growth is 30 to 40 percent per year for the last couple of years and the total IT

industry revenues crossed USD 2 billion in fiscal year (2005-06) whereas, total exports crossed USD 1 billion. This growth of IT industry exports in the last three years was around 50 percent, while the domestic market has grown at 33 percent per annum. The global IT companies like NCR, IBM, Oracle, Hyundai IT, and Halliburton are operating for South Asia and Middle East from Pakistan. Hundreds of millions of quality software is being developed and over 60 thousand professionals are employed in this industry. Recent publications in the country confirms that Pakistan is now on the world IT map and the overall size of IT industry is on the path of expansion.

2. Rationale of the study

The numerical figures and data stated above motivated us to initiate a study which evaluates and analyzes the productivity of IT industry based on performance of individual IT firms. We also want to investigate that, up to what extent an individual IT firm is contributing to the overall growth of the IT industry of Pakistan?. In-order to accomplish this task, eleven factors representing three main areas for performance evaluation are taken as independent variables which are; Organizational Commitment and Esprit de Corps as factors of Employee Orientation; Marketing Turbulence, Competitive Intensity, Technology Turbulence, and Market Dynamics as factors of Environment; Formalization, Centralization, Departmentalization, and Rewards as factors of Organizational System. The dependent variable in this study is Organizational Performance. This study basically targets the companies operating in the IT industry in the geographical area of Islamabad, the capital of Pakistan.

This study will definitely be a value addition to the knowledge base and will be beneficial for the academic institutions, research organizations, individual researchers, technocrats and industrial analysts in Pakistan and abroad, who want to improve their understanding regarding performance of Information Technology Industry of Pakistan.

3. Purpose of the study

The purpose of the paper is to test the association developed in the question stated below and also to test the formulated hypothesis:

What is the level of association of the independent variables that are; Organizational Commitment, Esprit de Corps, Marketing Turbulence, Competitive Intensity, Technology Turbulence, Market Dynamics, Formalization, Centralization, Departmentalization, and Rewards with the dependent variable that is; Organizational Performance of IT sector firms operating in Islamabad, Pakistan?

4. Literature review

4.1 Organizational Productivity and Performance

The study of Vonortas and Auger (2002) found that the firm's productivity ultimately defines the overall performance of the industry in which they operate. They also stated that market share of any firm also predicts its performance in the industry. There is considerable evidence available from the previous researches, which indicates that high performance human resource practices are associated with organizational performance as it was found by Wright, Gardner, Moynihan and Allen (2005); Bartel (2004); Appelbaum et al. (2000); Bae and Lawler (2000); Batt (2002); Guthrie (2001); Huselid (1995); MacDuffie (1995) and Arthur (1994).

4.2 Organizational Commitment

In the study of Fey and Bjorkman (2001) and Kling (1995) it is mentioned that with the involvement of more employees under the concept of empowerment and decentralization, where employees can easily perform the operational decision making, can substantially contribute to the organizational performance. In multiple studies and books, it is mentioned and emphasized that a proper work structure of the organizations, where employees perform their tasks, have a positive impact on the performance of the organization. This statement indicates that organizational commitment will be greater in those employees who find working environment comfortable and conducive, and this phenomenon will ultimately enhance the organizational productivity. Kelley (1993) stated that organizational commitment generally translated into organizational goals and values. For example if a manager of an organization feels more committed to the organization and accepts the values and objectives assigned by the organization will eventually put his maximum efforts for the well being of the organization as stated by Locke and Latham (1990); Kother and Heskett (1992). In multiple studies, organizational commitment was found positively associated with employee performance and it is obvious that when an employee performs well on his job, its organizational performance also increases as stated by Brown and Peterson, (1993); Singh et al. (1996) and Parker et al. (2003).

4.3 Espirit de Corps

The field study of Banker and Field's (1996) reported that the effect of work teams on the organizational manufacturing performance, where the effect of work teams is also pronounced as Espirit de Corps, resultant of devotion and commitment of team members, has enhanced the quality and labor productivity in the organization.

4.4 Market Turbulence

Market turbulence is the rate of change in the composition of customers and their preferences reported in the study of Jaworski and Kohli (1993). If the market is turbulent then the preferences of the customer changes frequently whereas in the stable market the preferences of customers show little fluctuations overtime. So, organizational performance needs to be adjusted as according to the market turbulence and dynamics.

4.5 Competitive Intensity

The effect of market's environment on an organization as stated in the previous researches is often used as an independent variable to predict the organizational performance as found and stated by Cooper (1993), Cooper and Gimeno Gascon (1992) and Keeley and Roure (1990). Jaworshi and Kohli (1993) found that the organizations that face less competition or operate in low competitive or intense environment may get success because in this case customers have no other choice other than demanding the current firm's product or service. The research of Appiah-Adu and Singh (1998) found that the firms that usually operate in turbulent markets provide prompt information to their customers and competitors' in-order to reduce the factor of uncertainty. Competitive intensity as reported by Joworski and Kohli (1993) is a condition of high competition, where there are multiple options available to customers in the market to fulfill their demands, which determine that, in an intense competitive environment an organization can loose its business. Thus, evidence shows that, competitive intensity has a strong impact on the performance of the business.

4.6 Technological Turbulence

The study of Jaworski & Kohli (1993) found an inverse relationship between technological turbulence and organizational performance. Bennett and Cooper (1981), Houston (1986), Kaldor (1971) and Tauber (1974) reported that the competitive advantage of an organization is associated with the fact that how fast an organization changes itself with the changing technological orientation of the industrial environment, because an obsolete technology can not benefit an organization and fulfill the changing demands of the customers, who are dependent on the state of the art technologically manufactured products.

4.7 Market Dynamics

Muller, Walter and Gemuenden (2001) found that the market dynamics is associated with the short span of product life in market due to the high innovativeness of the competition related to software products. Gray et al. (1998) reported that market environment also has a great impact if it is taken as moderating variable in the study.

4.8 Government Policies

It is observed as well as reported by researchers that, if the governmental policies are in favor of the organization in particular and industry in general the overall performance of the organization on individual level and industry on collective level improves.

4.9 Formalization

Formalization is a central dimension of decision making structure as reported by Argouslidis and Baltas (2007). There are three basic dimensions of the organizational research which are specialization, formalization and centralization. Hall, Hans and Johnsons (1967) reported that, formalization represents the degree to which rules define roles, authority relations, communications, norms and sanctions and procedures. So, formalization has strong ties with the organizational performance.

4.10 Centralization

Hage and Aiken (1970) found that the centralization refers to the inverse of the amount of delegation of decision-making authority throughout an organization and the extent of participation by organizational members in decision making. In the study of Pugh, Hickson, Hinings and Turner (1969) it is reported that the centralization determines the intensity up to which the power regarding decision making is confirmed to the upper hierarchy of organizational management, in which autonomy, locus of control and authority delegated are considered as administrative tools. Arthur (1994) evaluated thirty mini-mills on the basis of productivity and found that when the authority is decentralized, the turnover was reduced among the employees, thus, enhanced the organizational commitment and resulted in increased organizational performance.

4.11 Reward System

The observations of Delery and Doty (1996) predicted that when an organization provides job security and rewards to its employees, it results in long-term commitment of the employees with the organization which will ultimately compel them to put-in their best to increase organizational performance. Lawler (1990) found that the corporate reward strategy should be adopted by the organizations that will certainly help them to leap ahead of their competitors in the market and also at the same time provide them a competitive advantage.

4.12 Departmentalization

Jaworski and Kohli (1993) found that the Departmentalization basically refers to the numbers of departments into which organizational activities are segregated and compartmentalized. (See figure-1)

4.13 Mathematical Model

The diagrammatical research model shown in figure-1 is written in a mathematical form below:

$$\mathbf{O}rgPer_{i,t} = \alpha_0 + \beta_1\, OrgComt_{i,t} + \beta_2\, EsDec_{i,t} + \beta_3\, MarTub_{i,t} + \beta_4\, CompInt_{i,t} +$$
$$\beta_5\, TechTub_{i,t} + \beta_6\, MatDyn_{i,t} + \beta_7\, GovtPol_{i,t} + \beta_8\, Form_{i,t} + \beta_9\, Centz_{i,t}$$
$$+ \beta_{10}\, \mathrm{Re}\, wSys_{i,t} + \varepsilon_{i,t}$$

In above mathematical model, (i) represents the firm having a certain level of performance at a particular time t. So, organizational performance is the function of x having (t > 0) and (i approaches to n number of firms) to be evaluated regarding their level of performance. Thus, the sum of predictors in above mathematical equation can be written as follows:

$$Ind\,\mathrm{Pr}od_{n,t} = f(x)_{n,t} = \alpha_0 + OrgPerf \sum_{i=1}^{n} \begin{bmatrix} \beta_1\, OrgComt_{i,t} + \beta_2\, EsDec_{i,t} + \\ \beta_3\, MarTub_{i,t} + \beta_4\, CompInt_{i,t} + \\ \beta_5\, TechTub_{i,t} + \beta_6\, MatDyn_{i,t} + \\ \beta_7\, GovtPol_{i,t} + \beta_8\, Form_{i,t} + \\ \beta_9\, Centz_{i,t} + \beta_{10}\, \mathrm{Re}\, wSys_{i,t} \end{bmatrix} + \varepsilon_{i,t}$$

(where. t > 0)

The equation mentioned above represents the sum of variables contributing to the industrial productivity where i ranges from (1 to n) number of firms operating in the industry. Now, the above equation can be written as:

$$f(x)_{n,t} = \alpha_0 + OrgPerf \sum_{i=1}^{n} \begin{bmatrix} Factors\ of\ Employee\ Orientation \\ + Factors\ of\ Organizational\ Environment \\ + Factors\ of\ Organizational\ System \end{bmatrix} + \varepsilon_{i,t}$$

The above written equation represents that the function of x is equal to the sum of the factors of employee orientation, organizational environment and organizational system sigma to the organizational performance of the firms ranging from (1 to n) operating in the industry plus constant and model errors.

The interpretations of the above mathematical equation are given in the table 1. (See table-1)

5. Hypothesis Development

The hypotheses formulated after review of the literature are given below:

Hypothesis - 1: There is strong relationship between (organizational commitment) high performance human resource practices and organizational performance.

Hypothesis - 2: Espirit de Corps has a strong relationship with the quality and labor productivity in the organization.

Hypothesis - 3: There is an inverse (negative) relationship between market turbulence and organizational performance.

Hypothesis - 4: Competitive intensity has an inverse (negative) relationship with the performance of the business.

Hypothesis - 5: There is an inverse (negative) relationship between technological turbulence and organizational performance.

Hypothesis - 6: The market dynamics is inversely (negative) associated with the organizational performance due to the high innovativeness of the competition related to software products.

Hypothesis - 7: There is strong relationship between government policies and organizational performance.

Hypothesis - 8: There is strong relationship between formalization and organizational performance.

Hypothesis - 9: There is an inverse (negative) relationship between centralization and organizational performance.

Hypothesis - 10: here is strong relationship between reward system of employees and organizational performance.

The testing of the hypotheses is confined to the primary data collected from the area of Islamabad.

6. Methodology

6.1 Sample

The sample is drawn from the total number of employees working in the IT sector firms operating in Islamabad, Pakistan, in a non-contrived environment. We have selected fifteen leading IT sector firms **[i.e, ZTE, Motorola, Teralight, Bentley, Averox, IBM, Falcon, Netsol, Nortel, CISCO, Askari Information Systems (AIS), Pakistan Software Export Board (PSEB), DPS, Pakistan Revenue Automation Limited (PRAL), LMKR]** from which respondents where pooled up in the sample. Each organization was given 15 questionnaires which resulted in a total of 225 questionnaires. A convenient sampling technique (non-probability sampling method) was adopted to tap the responses from the respondents. A total of 142 employees of IT sector firms responded and returned the completely filled questionnaires, for which the response rate resulted into a score of 63 percent.

6.2 Instrumentation

The instrument used to collect data from the subjects was a questionnaire having different sub-parts. The instrument was basically comprised of three parts in which questions were distributed regarding, employee orientation, environmental component, organizational system, and organizational performance. The sub-parts of the three major parts incorporated in the questionnaire were adopted from different previous studies; Part 1 (Organizational Commitment, Espirit de Corps), Part 2 Market Turbulence, Competitive Intensity, Technological Turbulence), Part 3 (Formalization, Centralization, Departmentalization, Reward Systems) and Part 4 (Organizational/ firm Performance, question 1 & 2) are adopted from the study of Jaworski & Kohli (1993). Part 2 (Market dynamics) and Part 4 (Organizational/ Company Performance, questions 3 to 7) are adopted from the study of Mueller, Walter & Gemuenden (2001). After collecting 142 responses the reliability of the instrument was checked by the help of Statistical Package for Social Sciences which resulted in a Cronbach's Alpha score of 0.8398, which confirmed the reliability of the instrument. All the items of the questionnaire were designed on five point scale ranging from (Strongly Disagree as "1" to Strongly Agree as "5") (see annexure).

6.3 Procedure

The data collection was done by means of well developed, adopted questionnaire having four parts. This questionnaire was further arranged according to the needs of the current study. All of the questionnaires were distributed among the respondents in the area of Islamabad personally by the researchers. The data was collected in the time frame of 55 days and then responses were fed into the Statistical Package for Social Sciences (SPSS) for analysis and evaluation. Multiple regression analysis was used as a statistical test to determine the degree of relationship/association between the variables involved in this study.

7. Results

The "Table 2" explains that the probability of F statistics is 6.471 for the overall regression analysis (p>0.001), (p>0.05). The un-standardized coefficients (beta for IV-2, IV-4, IV-6 & IV-9 are negative) show that, they have inverse relationship with other independent variables of the study. The (p > 0.05 for IV-10, IV-1 & IV-7) shows that, they are the major contributors in the overall strength of the relationship among the independent and dependent variables considered in this study.   (See table 2)

The significance values for (IV-2, IV-3, IV-4, IV-5, IV-6, IV-8, IV-9) is (p>0.05) which shows that these independent variables have no significance relationship with the dependent variable, whereas, result of (p<0.05) for (IV-1, IV-7, IV-10) shows that these independent variables have a significance relationship with the dependent variable. The value of R-square 0.331 shows that, there is an average level of relationship in the overall models of independent variables with the dependent variable.

The testing of hypotheses developed earlier revealed the following results after which the mathematical model of this research has been modified:

$$Ind\,Pr\,od_{n,t} = f(x)_{n,t} = \alpha_0 + OrgPerf \sum_{i=1}^{n} \begin{bmatrix} \beta_1\,OrgComt_{i,t} - \beta_2\,EsDec_{i,t} - \\ \beta_3\,MarTub_{i,t} - \beta_4\,CompInt_{i,t} - \\ \beta_5\,TechTub_{i,t} - \beta_6\,MatDyn_{i,t} + \\ \beta_7\,GovtPol_{i,t} - \beta_8\,Form_{i,t} - \\ \beta_9\,Centz_{i,t} + \beta_{10}\,Re\,wSys_{i,t} \end{bmatrix} + \varepsilon_{i,t}$$

(where, t > 0)

The above modification of the mathematical model is done after the analysis which shows that function of 'x' representing the industrial productivity, has strong association with the organizational commitment, governmental policies and reward system of the employees. Rest of the variables in the model have weak association with the organizational performance and thus considered as weak predictors of the industrial productivity.

8. Discussion

It is evident from the results as predicted by the figures illustrated in the table 2 that, organizational commitment has a strong relationship with the organizational performance as it is supported by the multiple studies of: Brown and Peterson (1993); Singh et al. (1996); Parker et al. (2003). It is true because in IT sector of Pakistan, firms have a good salary structure which is generally a factor which retains the young professionals in these IT firms. The ($p<0.05$) for the independent variable for government policies which is also an understood case, because a favorable policy devised by government always brings improvement in the performance of the industry and it is evident from the current improvements in the policy structure regarding 'doing business in Pakistan' by the government and also introduced multiple strategies and procedures clearly stated in the Medium Term Development Framework (MTDF) (2005 – 10) road map to enhance the   capacity of domestic industries as well as to attract FDIs.

The third case in which ($p<0.05$) is of reward system which can be supported by the evidence from the study of Delery and Doty (1996) in which they reported a positive association of rewards system with the performance of the organization. In Pakistan, the IT sector always rewards medals and certificates to its employees on their performances. It is not restricted to the firms but the former Minister for Information Technology, Mr. Owais Ahmed Lagari had also given achievement of excellence awards to the best performers on yearly basis in the IT industry of Pakistan. This culture of rewarding best IT people is still present in the industry.

The ($p>0.05$) for the independent variables which are, Esprit de Corps, Marketing Turbulence, Competitive Intensity, Technology Turbulence, and Market Dynamics, Formalization and Centralization. Here, we can generally support this result with the argument that, the IT industry of Pakistan is relatively new industry with around 15 -20 years of tenure, where firms are developing at a fast pace. In-addition, the last fiscal year's revenue also predicted the high performance of the IT industry and it is obvious that individual firms are also on the path of growth and prosperity. These associations and confirmation of null hypothesis also explains that in IT industry of Pakistan, if software market is turbulent, competitive and dynamic the performance level of each firm operating in the industry will be affected. We found that productivity is enhanced in those firms which have well organized departments led by an experienced and professional department head.

Globalization along with its dynamics and challenges has a strong impact on the technology being used by the firms across the world. So, as world advances in time, technology being used by the firms gets obsolete. This obsolescence factor of technology resulted in the adaptation of new state of the art technology to meet and exceed the needs of the customers and created competitive advantage for the organization. In our study technological turbulence resulted in direct relationship with the performance of the firms operating in the IT sector of Pakistan and this result is not concurrent with the hypothesized statement.

The firms studied have centralized structure which was evident from the tall hierarchy of these firms. It can be supported by the fact that majority of the organizations in Pakistan have centralized system of operations and all decisions are directed from top to bottom. So, similar is the case with the firms selected for this paper. Instead of a strong centralized organizational structure, we found non-formalized working environment in these firms.

Esprit de Corps, translated as teamwork is not so popular in companies operating in Pakistan as managers and employees pursue their individual assignments as part of the project assigned to them. This basically resulted in an inverse association of Esprit de Corps with the organizational performance in the IT sector firms of Pakistan.

9. Conclusion

This research encompasses an in-depth analysis of the association of the independent variables with the dependent variable. The results and analysis from SPSS confirmed that organizational commitment, governmental policies and reward systems have a strong association, where as Esprit de Corps, Marketing Turbulence, Competitive Intensity, Technology Turbulence, and Market Dynamics, Formalization and Centralization have negative association with the organizational performance as in this case we have rejected the alternate hypothesis developed after the literature review.

In the culture of Pakistan where economy is growing at GDP rate of 7.0 percent per annum, old firms are growing, and new are emerging as well as entering in to the industries of multiple disciplines operating in Pakistan. Similar is the case of Information Technology industry where firms are growing and expanding their businesses. The current political stability and good economic indicators have given confidence to the local as well as foreign investors to indulge in business activities in Pakistan without any hindrance. But, being a young IT industry, the firms have to face certain challenges and this factor changed the responses, and altered some of the associations in the study. The findings of the

study as assessed after the application of multiple regression analysis elucidated the fact that there exists an average level of association among the variables considered in the current study. Thus, we are confident that the overall performance of the IT sector of Pakistan is satisfactory and the industry is productive.

There is a room for improvement in this sector which can be achieved by enhancing the productivity of the IT firms by greater emphasis on issues regarding human capital, up-gradation of existing infrastructure, constant up-gradation of the existing technology and equipment as well as close coordination of all stakeholder to uplift this industry, so that it can become one of the leading software exporting industry of the Asian region.

10. Further research

There is a need to utilize tools other than we have adopted like; productivity ratios for "Total Factor Productivity" to assess the overall productivity of the IT sector firms as well as the industry. The list of concepts used in this research can be extended to get insight into other factors of productivity in which infrastructure, technology and quality can be used as variables. The performance of firms operating across Pakistan especially in the cities of Lahore and Karachi, (among the major metropolitans of Pakistan) can also be tapped to expose useful information regarding important factors of productivity, in-order to understand the complete picture of Information Technology industry of Pakistan.

References

Appelbaum, E., Bailey, T., Berg, P., and Kalleberg, A. (2000). "Manufacturing advantage: Why high-performance work systems pay off", Ithaca, NY: ILR Press, USA.

Appiah-Adu, Kwaku; Singh and Satyendra, (1998). Customer orientation and performance: a study of SMEs. *Management Decision*, 36 (6), 385-394.

Argouslidis, Paraskevas and Baltas, George. (2007). Structure in product line management: The role of formalization in service elimination decisions. *Journal of the Academy of Marketing Science, 35 (4)*, 475-491.

Arthur, J. (1994). Effects of human resource systems on manufacturing performance and turnover. *Academy of Management Journal*, 37: 670-687.

Bae, J., & Lawler, J. J. (2000). Organizational and HRM strategies in Korea: Impact on firm performance in an emerging economy. *Academy of Management Journal*, 43: 502-517.

Banker, R.D. and Field, J.M. (1996). Impact of Work Teams on Manufacturing Performance: A Longitudinal Field Study. *Academy of Management Journal*, 39(4): 867-91.

Bartel, A. P. (2004). Human resource management and organizational performance: Evidence from retail banking. *Industrial and Labor Relations Review,* 57: 181-203.

Batt, R. (2002). Managing customer services: Human resource practices, quit rates, and sales growth. *Academy of Management Journal*, 45: 587-597.

Bennett, Roger and Robert Cooper. (1981). Beyond the Marketing Concept, *Business Horizons*, 22 (June), 76-83.

Brown SP, Peterson RA. (1993). Antecedents and consequences of salesperson job-satisfaction meta-analysis and assessment of causal effects. *Journal of Marketing Research*, 30:63-77.

Cooper, Arnold C. (1993). Challenges in Predicting New Firm Performance. *Journal of Business Venturing*, 8, 241-253.

Cooper, Arnold C.; Gimeno Gascón, F. Javier. (1992). Entrepreneurs, processes of founding, and new firm performance, Sexton, Donald L.; Kasarda, John D. (eds.): *The State of the Art of Entrepreneurship*, 301-340.

Delery, J. E., & Doty, H. D. (1996). Modes of theorizing in strategic human resources management: Test of universalistic, contingency, and configurational performance predictions. *Academy of Management Journal*, (39), 802-836.

Fey, C.F. and Bjorkman, I. (2001). The Effect of Human Resource Management Practices on MNC Subsidiary Performance in Russia. *Journal of International Business Studies*, 32(1): 59-75.

Fey, C.F. and Bjorkman, I. (2001). The Effect of Human Resource Management Practices on MNC Subsidiary Performance in Russia. *Journal of International Business Studies*, 32(1): 59-75.

Gray, Brendan, Matear, Sheelagh, Boshoff, Christo, Matheson and Phil. (1998). Developing a better measure of market orientation. *European Journal of Marketing*, (32), 884-903.

Guthrie, J. P. (2001). High involvement work practices, turnover and productivity: Evidence from New Zealand. *Academy of Management Journal,* (44), 180-190.

Hage, Jerald and Michael. Aiken. (1970). Social Change in Complex Organizations, (New York), USA.

Hall, Richard; J Eugene Hans, and Norman. J. Johnson. (1967). Organizational Size, Complexity and Formalization.

American Sociological Review, 32, 6 (December 1967), pp. 903-12.

Houston, Franklin S. (1986). The Marketing Concept: What It Is What It Is Not. *Journal of Marketing*, 50 (April), 81-7.

Huselid, M. A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management Journal*, (38), 635-672.

Internet definition of 'productivity'. [Online]: Retrieved, October 30, 2007, from http://strategis.ic.gc.ca/sc_innov/productivity/engdoc/prod_questions.html.

Jaworski, B. J & Kohli, A. K. (1993). Market Orientation: Antecedents and Consequences. *Journal of Marketing*, Vol. 57, 53-70.

Kaldor, A. G. (1971). Imbricative Marketing, *Journal of Marketing*, 35 (April), 19-25.

Keeley, Robert H.; Roure, Juan B. (1990). Management, Strategy, and Industry Structure as Influences on the Success of New Firms: A Structural Model, *Management Science*, 36 (10), 1256-1267.

Kelley SW. (1993). Discretion and the service employee, *Journal of Retailing,* (69), 104-26.

Kling, J. (1995). High Performance Work Systems and Firm Performance, *Monthly Labor Review,* 118(5): 29-37.

Kotter JP, Heskett JL. (1992). Corporate Culture and Performance, The Free Press: New York. Locke EA, Latham GP (1990). Work motivation: the high performance cycle. In: Work Motivation (UEA Kleinbeck), pp. 4-25. Erlbaum Associates: Hillsdale, New Jersey, USA.

Lawler, Edward. E. (1990). Strategic Pay: Aligning Organizational Strategies and Pay Systems, San Francisco, USA.

Locke EA, Latham G. P. (1990). Work motivation: the high performance cycle. In Work Motivation, (ed., UEA Kleinbeck), pp. 4–25. Erlbaum Associates: Hillsdale, New Jersey, USA.

MacDuffie, J. P. (1995). Human resource bundles and manufacturing performance, *Industrial and Labor Relations Review,* (48), 197-221.

Mueller, T. A; Walter, A. & Gemuenden, H. G. (2001). The Impact of Customer Orientation and Competitor Orientation on Organizational Performance of New Software Ventures, IMP-2001, Competitive, Department of Technology and Innovation Management, Technical University of Berlin, Germany.

Pakistan Software Board press release, Pakistan IT Revenue Crossed USD 2 billion dated 3rd May, 2007, retrieved, October 31, 2007, from http://www.itinsight.info.

Parker CP, Baltes BB, Young SA, Huff JW, Altmann RA, et al. (2003). Relationships between psychological climate perceptions and work outcomes: a meta-analytic review, *Journal of Organizational Behavior,* (24), 389-416.

Pugh, D. S., Hickson, D. J., Hinings, C. R., & Turner, C. (1969). The context of organization structures, *Administrative Science Quarterly*, 14, 91-114.

Singh J, Verbeke W, Rhoads GK. (1996). Do organizational practices matter in role stress processes? A study of direct and moderating effects for marketing-oriented boundary spanners, *Journal of Marketing*, (60), 69-86.

Tauber, Edward M. (1974). How Marketing Discourages Major Innovation. *Business Horizons*, 17 (June), 22-6.

Vonortas, Nicholas and Robin Auger. (2002). Assessing Industrial Performance, Manuscript: Center for International Science and Technology Policy; George Washington University, USA.

Wright, P. M., Gardner, T. M., Moynihan, L. M., & Allen, M. R. (2005). The relationship between HR practices and firm performance: Examining causal order. *Personnel Psychology*, (58), 409 - 446.

Table 1. Symbols and their meanings of the mathematical model

Symbol	Meaning	
α	Constant	
ε	Model error	
i	Firm i operating in the industry	
t	Firm performance at a particular time	
n	Number of Firms in the industry	
IndProd	Industrial Productivity	
Constant	OrgPerf	Organizational Performance
IV-1	OrgComt	Organizational Commitment
IV-2	EsDec	Espirit De Corps
IV-3	MarTub	Marketing Turbulence
IV-4	CompInt	Competitive Intensity
IV-5	TechTub	Technological Turbulence
IV-6	MatDyn	Market Dynamics
IV-7	Govtpol	Governmental Policies
IV-8	Form	Formalization
IV-9	Centz	Centralization
IV-10	Rewsys	Reward System

Table 2.　(Beta Coefficients, Standard error in parenthesis, t-Value in Brackets and P-Values in italics)

Const.	IV-1	IV-2	IV-3	IV-4	IV-5	IV-6
2.489	0.394	-0.078	0.009	-0.026	0.003	-0.032
(4.221)	(0.134)	(0.123)	(0.142)	(0.133)	(0.173)	(0.166)
[0.590]	[2.936]	[-0.634]	[0.066]	[0.192]	[0.015]	[-0.109]
0.556	*0.004*	*0.527*	*0.948*	*0.848*	*0.988*	*0.850*
Result of Hypothesis Testing	H1 Accepted	H2 Rejected	H3 Rejected	H4 Rejected	H5 Rejected	H6 Rejected

IV-7	IV-8	IV-9	IV-10	R Squ.	F-Stat.
0.469	0.009	-0.143	0.455		6.471
(0.162)	(0.102)	(0.102)	(0.117)		
[2.893]	[0.089]	[-1.40]	[3.90]	0.331	
0.004	*0.929*	*0.164*	*0.000*		*0.000*
H7 Accepted	H8 Rejected	H9 Rejected	H10 Accepted		

Legend:　IV-1: Measure of frequency of respondents regarding organizational commitment.

　　　　　IV-2: Measure of frequency of respondents regarding espirit de corps.

　　　　　IV-3: Measure of frequency of respondents regarding marketing turbulence.

　　　　　IV-4: Measure of frequency of respondents regarding competitive intensity.

　　　　　IV-5: Measure of frequency of respondents regarding technological turbulence.

　　　　　IV-6: Measure of frequency of respondents regarding market dynamics.

　　　　　IV-7: Measure of frequency of respondents regarding governmental policies.

　　　　　IV-8: Measure of frequency of respondents regarding formalization.

　　　　　IV-9: Measure of frequency of respondents regarding centralization.

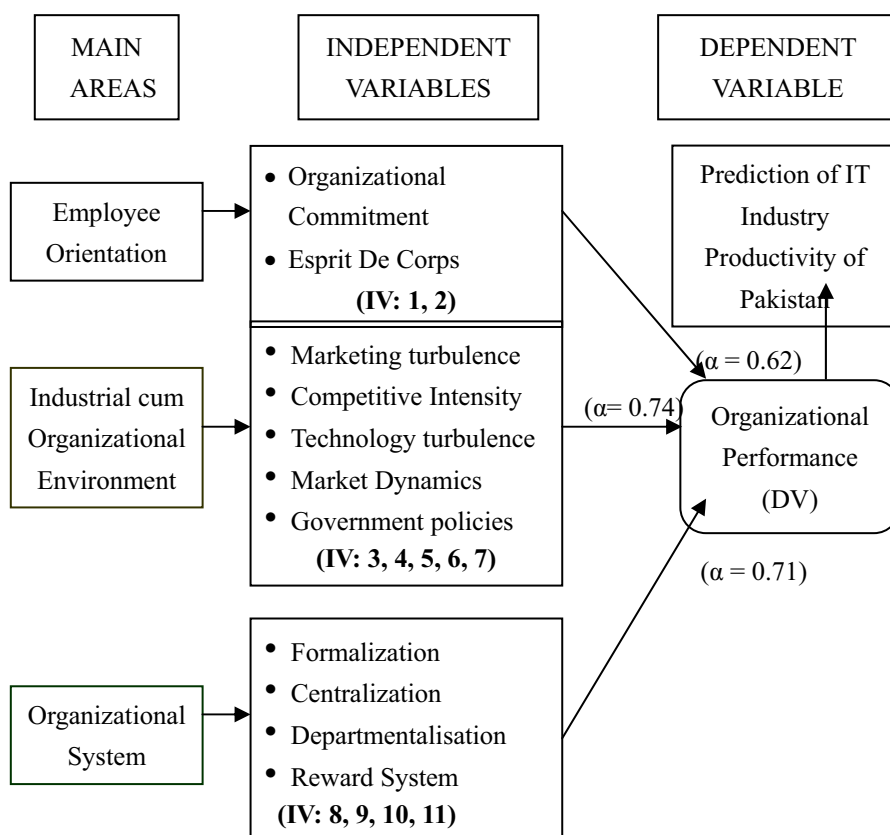　　　　　IV-10: Measure of frequency of respondents regarding reward system.

Figure 1. Research model (Theoretical Framework)

Annexure: Questionnaire adopted and re-designed for the research study

PART 1: Data collection regarding Organizational Commitment and Espirit de Corps					
Scale	Strongly Disagree	Disagree	Nor Agree Nor Disagree	Agree	Strongly Agree
	1	2	3	4	5

1	Employees feel that as through their future is intimately linked to that of this organization	1	2	3	4	5
2	Employees would be happy to make personnel sacrifices	1	2	3	4	5
3	The bond between this organization and its employees is weak	1	2	3	4	5
4	In general, employees are proud to work for this organization	1	2	3	4	5
5	Employees often go above and beyond the call of duty to ensure the well-being of this organization	1	2	3	4	5
6	Our people have little or no commitment to this organization	1	2	3	4	5
7	It is clear that employees are fond of this organization	1	2	3	4	5
8	People in this organization/ company are genuinely concerned about the needs and problems of each other	1	2	3	4	5
9	A team spirit pervades all ranks in this organization	1	2	3	4	5
10	Working for this organization is like being a part of a big family	1	2	3	4	5
11	People in this organization feel emotionally attached to each other	1	2	3	4	5
12	People in this organization feel like they are "in it together"	1	2	3	4	5
13	This organization lacks an "spirit de corps"	1	2	3	4	5
14	People in this organization view themselves as independent individuals who have to tolerate others around them	1	2	3	4	5

PART 2: Data collection regarding Marketing Turbulence, Competitive Intensity, Technological Turbulence, Market Dynamics and Governmental Policies					
Scale	Strongly Disagree	Disagree	Nor Agree Nor Disagree	Agree	Strongly Agree
	1	2	3	4	5

1	In our kind of business, customers' product or service preferences change quite a bit over time	1	2	3	4	5
2	Our customers tend to look for new product or service all the time	1	2	3	4	5
3	Our customers are very price-sensitive	1	2	3	4	5
4	We are witnessing demand for our products and services from customers who never bought them before	1	2	3	4	5
5	New customers tend to have product or service-related needs that are different from those of our existing customers	1	2	3	4	5
6	We service many of the same customers that we used to service in the past	1	2	3	4	5
7	Competition in our industry is cutthroat	1	2	3	4	5
8	There are many "promotion wars" in our industry	1	2	3	4	5
9	Anything that one competitor can offer, others can match readily	1	2	3	4	5
10	Price competition is a hallmark of our industry	1	2	3	4	5
11	One hears of a new competitive move almost every day	1	2	3	4	5
12	Our competitors are relatively weak	1	2	3	4	5
13	The technology in our industry is changing rapidly	1	2	3	4	5
14	Technological changes provide big opportunities in our industry	1	2	3	4	5
15	It is very difficult to forecast our industrial technology in the next 2 to 3 years	1	2	3	4	5
16	A large number of new product/service ideas have been made possible through technological breakthroughs in our industry	1	2	3	4	5
17	Technological developments in our industry are rather minor	1	2	3	4	5
18	In our target market suppliers launched frequently new products or products with extended features	1	2	3	4	5
19	We had anticipated entry of new, additional competitors in our market	1	2	3	4	5
20	Needs and requirements of our customers changed rapidly	1	2	3	4	5
21	The competition reacted efficiently to changed customer requirements	1	2	3	4	5
22	The competitors changed their marketing activities frequently	1	2	3	4	5
23	Products and services on the target market became rapidly obsolete	1	2	3	4	5
24	Governmental policies are in favor of our organization	1	2	3	4	5
25	The organization is performing well under the policies of the government	1	2	3	4	5
26	I am satisfied with the overall performance of the organization	1	2	3	4	5
27	There is a need of consistency in the governmental policies related to the industry	1	2	3	4	5
28	Government should revise its policies related to the industry	1	2	3	4	5

<table>
<tr><td colspan="7" align="center"><u>PART 3</u>
Data collection regarding Formalization, Centralization, Departmentalization and Reward Systems</td></tr>
</table>

Scale	Strongly Disagree	Disagree	Nor Agree Nor Disagree	Agree	Strongly Agree	
	1	2	3	4	5	

Number of Departments in your Organization _____

1	I feel that I am my own boss in most of the matters	1	2	3	4	5
2	A person in this organization can make his own decisions without checking with anybody else	1	2	3	4	5
3	How things are done in this organization is left up to the person who does the work	1	2	3	4	5
4	People in our organization are allowed to do work in their own pleasing style	1	2	3	4	5
5	Most people in this organization make their own rules on the job	1	2	3	4	5
6	The employees are constantly being checked on for rule violations	1	2	3	4	5
7	People here feel that they are constantly being watched, to see that they obey all the rules	1	2	3	4	5
8	In this organization not a single action can be taken until a supervisor approves the decision	1	2	3	4	5
9	A person who wants to make his own decision would be quickly discouraged here	1	2	3	4	5
10	Even small matters have to be referred to someone higher up for a final answer	1	2	3	4	5
11	I have to ask my boss before I do almost anything	1	2	3	4	5
12	Any decision I make has to have my boss's approval	1	2	3	4	5
13	No matter which department they are in, people in this organization get recognized for their contributions	1	2	3	4	5
14	Customer satisfaction assessments influence senior managers' pay in this organization	1	2	3	4	5
15	Formal rewards (i.e., pay raise, promotion) are available to anyone who consistently provides good market intelligence	1	2	3	4	5
16	Employee performance in this organization is measured by the strength of relationships they build with the customers	1	2	3	4	5
17	Employee's monetary compensation is almost entirely based on their performance	1	2	3	4	5
18	We use customer polls to evaluate organizational performance	1	2	3	4	5

PART 4: Data collection regarding Company/ Organizational Performance					
Scale for Question 1 & 2	Poor	Average	Good	Very Good	Excellent
	1	2	3	4	5
Scale for Question 3 – 7	Strongly Disagree	Disagree	Nor Agree Nor Disagree	Agree	Strongly Agree
	1	2	3	4	5

1	The overall performance of the organization/ company year last year	1	2	3	4	5
2	The overall performance of the organization/ company relative to major competitors last year	1	2	3	4	5
3	The market-share of the organization has increased in the last 3 years	1	2	3	4	5
4	I am very satisfied with the financial success of the organization	1	2	3	4	5
5	The organization has reached a strong competitive position in the market	1	2	3	4	5
6	I am very satisfied with the market performance of the organization	1	2	3	4	5
7	The organization/company has reached an excellent technological competitive position	1	2	3	4	5