ISSN: 1997-4507

Volume – 2, Number - 1, Jun 2008

NUML
JOURNAL OF MANAGEMENT & TECHNOLOGY

NATIONAL UNIVERSITY OF MODERN LANGUAGES

H-9, Islamabad, PAKISTAN

ISSN: 1997-4507 **Volume – 2, Number - 1, Jun 2008**

NUML Journal of Management & Technology

Table of Contents

INTEGRATED CROSS-CULTURAL TRAINING APPROACH

Dr Najeeb A. Khan

ABSTRACT

Current research in international research has highlighted the failure of many MNCs, due to the ethnocentric approach of their managers, when they were appointed to represent their organizations in foreign countries. This is why, the number of MNCs, which arrange cross-cultural training for their managers has been rising in the recent past. In fact the cost of failure in the case of foreign investment is too high and even the highly established companies undertake all the pro-active measures before venturing in a diferent culture. Many companies falsely assume that cross-cultural training of their managers is a suficiently dependable strategy to deal with an unfamiliar cultural situation. The importance of such training cannot be denied. However, the failure of managers may also be attributable to poor selection, inappropriate compensation package and motivation, inadequate communication between the Headquarter and the expatriate manager or lack of a proper career and repatriation arrangement for the concerned individual. This Article attempts to bridge the gap between training and the other pre-requisites mentioned above and proposes an integrated approach of various highly important HR activities. Further research in this area can provide more useful insights in the field of international business, global marketing and international management.

WHAT ARE THE STAKES?

Currently, in this globalized world, many multinational corporations are entering the final stage of international business evolution, which is the global stage, after domestic and exporting stages. Quite a significant number of corporations, which had been successful at the domestic stage, tend to lose their competitive grip, if they had failed to understand and study the culture of the other country where they were establishing their subsidiaries.

Culture here, refers to many dimensions, such as the political environment, socio-economic conditions, languages, values and norms ,custom and rituals, laws, rules and regulations relating to trade, education, technology, and religion. Perhaps the most intriguing and challenging dimension of culture is understanding the attitudes, values and behavior of the individuals of other cultures with whom the Managers of multi-national-corporation have to deal with. Communicating with persons of other cultures is not easy and communication breakdowns are more the result of mis-understanding culture than grammatical or stylistic issues.

Grosse and Kujawa (1995, p286) have singled out certain complexities on usage of the word ‘culture’. We focus on politically defined area but culturally distinctive groups are not necessarily always countries and therefore cultural boundaries are inadvertently equated with national boundaries.

The main problem in studying the culture of other countries is that the cultural profiles prepared by researchers are often highly generalized and thus may produce only an approximation, or stereo type of national character. (Deresky H., 2006, p105). Cultural profile may, however, provide an insight of tentative expected attitude and behavior of managers of other countries.

Managers of Firms operating across their borders very often have to negotiate business deals, with managers as well as government officials of other countries. .Successful negotiations are crucial for meeting short term objectives, such as profitability and long term objectives of continuity of business relations and goodwill. Michael et al.(2001,p53) have highlighted that global managers face a dilemma in terms of international and inter-cultural competence. The lack of adequate language and global business skills has cost US firms lost contracts, weak negotiations, and ineffectual management. .

Cateora and Graham (2005 p564) suggest that seeds of success or failure often are sown at the negotiation table. (face-to face), where not only are financial and legal details agreed to, but

perhaps more important, the ambience of cooperation is established. Cross-cultural training of managers for international negotiations has thus acquired high importance.

The Author is a faculty member at Preston University, Islamabad, Pakistan

SIGNIFICANCE OF A PRO-ACTIVE APPROACH

Nelson A Carl (1999, p.71) suggests that global marketers need to understand and deal with diverse cultures for three reasons:

1) To overcome initial fear and mistrust
2) To conduct effective negotiations
3) To market products and services

Schiffman .and Kanuk. in their Book "Consumer Behavior" (2004, pp490-9 1) have pointed out certain failures on the part of international marketers in understanding cross cultural differences. International marketers, in the first instance, may not take adaptability of product in accord with the local needs very seriously. Products were adapted belatedly when the local consumers manifested a lukewarm response towards the foreign product.Intenational markets frequently neglect to modify their products to meet local customs and tastes. American marketers who sell food products in Japan frequently learn the hard way (through poor sales performance) that they must alter traditional product characteristics. For example, Snapple failed to sustain sales momentum in Japan because the consumers preferred clear, less sweet iced tea. It appears that Snapple was either unwilling or too slow to alter its ingredients to conform to local Japanese tastes. Kellog's the giant cereal company, has attempted to avoid the numerous "cultural traps" that are associated with cross- cultural marketing of food stuff in its international expansion. It has learned to draw careful distinctions between the Irish, who consume 17 pounds per year (the highest rate in the world), and the French, Italian and Greeks, whose meager breakfasts tend not to include cereal. Indeed an article discussing Kellogg's attempt to market cereals in Europe was titled "Europe Is Deaf to Snap! Crackle!Pop !"The story did note that some European moms were purchasing cereal for their children, and the cultural change on the Continent might make bigger breakfasts essential.

Even the colors of products have very strong associations in cross cultural context. Blue color in Holland, Iran, Sweden and India stood for warmth, death, coldness and purity, respectively. Foreign investments could thus go down the drain, if proper understanding of local culture is not developed.

Daniel(2001 ,p74-77) cites the example of Eritearians who has much lesser per capita consumption of fish as compared with Americans and Japanese, despite the rich resources of fish due to the religious taboos of eating sea food by Eritearians.

NEEDS IDENTIFICATION

As pointed out by Deresky (2006, p379), training in language and practical affairs is quite straightforward, but cross-cultural training is not; it is complex and deals with deep- rooted behaviors. The major thrust of cross-cultural training should be to equip expatriates to minimize misunderstandings as well as the inappropriate behaviors. One of the goals of this training is to reduce cultural shock—a state of disorientation and anxiety about not knowing how to behave in an unfamiliar culture. For instance, Daly (2006, p.27) suggests that one must be careful to read between lines of the society that he or she is interacting with. Often, "yes", does not mean "yes" when responses or assistance are sought. Daly (2006, p28)has cited another example of cultural difference in Swaziland where training participation tended to be subdued in contrast to American settings where great deal of discussion and debate takes place in training seminars .The Swaziland culture is one based on no confrontation and nonconflict.Thus normal points of disagreement often are not presented, even when statements should elicit heated debates. Furthermore, trainees in this setting often sit passively, to the point of not signaling disapproval through their body language .Such culturally specific behaviors may surprise the instructor, who

may not be familiar with the local culture. Such misunderstandings might crop up frequently in most settings, especially when new ideas and approaches are introduced that may not easily fit when transferred from one culture to another.

In the case of cross -cultural training, it needs to be clearly understood that training of expatriate managers is inseparable from their selection, compensation, and career development as global managers. In the first instance, the issue of trainability arises: it is only worthwhile to select those individuals for foreign assignments who possess relevant personality traits including social sensitivity, flexibility, and geocentric orientations. It is also important to ensure that these individuals understand the implications of serving abroad on different compensation and career terms. Perhaps the most important factor is the adjustment of spouse of the concerned manager in a foreign setting: it may inspire the manager to learn more about the culture of home country or to disengage corresponding to the level and speed of adjustment of the spouse.

According to Fatehi (1996, p342), 30 to 50 percent of all the expatriate placements do not work out as anticipated. Besides the direct financial costs involved with a failed expatriate assignment, the firm may incur other costs, including voided business deals, loss of valuable employees, the break up of joint ventures, and poor relations with the host Government.Fortunately, many MNCs have now realized the importance of cross-cultural training and the number of organizations involved in making preparations and arranging training prior to the departure of managers in foreign countries has increased lately.

NATURE OF TRAINING

G.Shames quoted by Fatehi (1996, p3 15) mentions following attribute and skill envisaged by intercultural training programs:

Self-awareness: The recognition of personal assumptions, values, needs, strenghths, and limitations, and the understanding of personal response in different cultural settings. Cultural reading: The ability to discover and understand the inherent logic in cultural norms and expectations.

Multiple perspectives: The ability to suspend judgment about other cultures and appreciate other's perspectives.

Intercultural communication: To send and receive verbal and nonverbal messages accurately in different cultures.

Cultural flexibility: The ability to adjust and change expectations and plans in accordance with the host country cultural requirements.

Cultural resilience: The skill to handle cultural shock, and recover and rebound from setbacks arising from cultural differences.

Skills in building interpersonal relationships; the ability to develop and maintain interpersonal relations with host country people.

Intercultural facilitation skills: The ability to manage cultural differences and use these differences constructively.

TAILORING TRAINING TO THE STAGES OF GLOBALISATION

Monica and McBey (2004, p300) have identified four stages of growth in evolution of MNCs.Each stage has planning implications for selection, training and career development of global managers. The intensity/rigor and contents of training may correspond to the following stages of internationalization of a firm:

a) Export stage:

At export stage a firm is focusing on the domestic market and usually begins to become international by exporting goods abroad as a mean of entering into new markets. At this stage, the firm is not altering its products for foreign markets. For this purpose, elementary training relating to customer values and business behavior in host and home countries is advisable.

b) Multi-domestic stage:

Growth of foreign market may provide an impetus to a firm to set up a subsiadiary.Culturally appropriate products is produced and cultural sensitivity becomes crucial for the success of the firm. In this stage moderate to high rigor of training is needed in business practice and law, and production and service procedures in addition to the basics including knowledge about cultures, interpersonal and negotiation skills.

c) Multinational corporation stage:

In this stage the firm may have its corporations in various countries and has embarked upon standardizing the products and services around the world to become more efficient as compared with its competitors. At this stage, the emphasis of training is more on international strategy, and corporate culture, in addition to the contents for previously mentioned stages. The rigor of training is high moderate to high.

d) Global stage:

At this stage companies are striving to introduce culturally sensitive products, with the least amount of cost (Belcourt and McBey, 2004, p301). A geo-centric perspective is taken by the company management and a high rigor of training is warranted with emphasis on global conduct policies and global culture.

TRAINING METHODOLOGY

As evident from the literature on intercultural training, most of the MNCs are using the documentary approach for training their managers deputed on foreign assignments. The trainees are provided with material relating to the country's history, geography, socio political and economic systems, and cultural practices. In addition, lectures and films are arranged to provide them with an insight of day-to-day concerns as local transportation, housing, shopping, schools and finances.

Fatehi (1996, p31 6) has suggested that managers need to develop an in-depth sensitivity to a culture's mores and behavioral patterns. In fact, they should be given specialized training that goes beyond a review of reports and instructions in foreign languages. The scope and depth of the training should match the extent and frequency of interaction and involvement with the people of different cultures. As the need for interaction with different cultures increases, training programs should assume a more interactive or affective- immersion -oriented perspective.

Quoting R.D.Alert, Fatehi (1996,p316) mentions the benefits of using intercultural assimilator or intercultural sensitizer (ICS).This instrument attempts to provide the learners with extensive information about a target culture . The information chosen for the ICS portrays the very important and significant differences between the two cultures .The basic requirement for constructing an ICS is to identify two situations and critical problems and to provide the learner

with an active experience from which they can learn the behavior, norms, perspectives, attributes, values and customs of other cultures.

CONCLUSIONS

As already discussed in the preceding paragraphs, around fifty percent of the firms do not arrange cross-cultural training for the concerned managers. It may be assumed that some of them may not feel the need believing that managers will learn by hit and trial method during their stay in the host country. As pointed out by Kotabe and Helson (2001, p504) once the expatriate is overseas, training becomes more difficult to provide, but it is even more important. As discussed above, the more different the culture into which people are venturing, the more specific and rigorous the training needs to be, and the more the needs to incorporate such experiential tactics such as simulations and role plays aimed at specific differences.

Recently,a number of scholars as well as practicing managers have opined that unless the expatriate manager fully immerses himself/herself into the foreign culture, the tensions and feelings of alienation will persist.Kotabe and Helson(200 1,p126) are of the view that expatriates must recognize that within a two – to four-year average time frame abroad they will never internalize enough of the local culture to overcome all social and communication concerns. Even with the appropriate training, the expatriated remain the products of their home culture. They will eat with a fork when a hand is more polite, shake on a deal and thereby show their lack of faith, or require that a contract with all possible contingencies spelled out be signed in triplicate when honor and trust dictate that the deal go through on a shared local drink. These may appear small social problems, but such social problems may keep the expatriate out of important deals. Any assumption on the part of the management that cross cultural training would suffice to prepare the expatriate manager to face the global challenge, would be an over-simplification of the matter. The purpose could be achieved by carefully selecting the appropriate person, training him /her, followed by motivation, communication, and arranging respectable repatriation calls for the *integration* of this human resource related functions. By *integrating* various HRD activates, the *synergetic* effect is more likely to enhance the effectiveness of the cross cultural training.

Fatehi (1996,p3 17)has also posited the same: while the MNCs culture may affect and even change the way the manager behave in work/business settings, this change in behavior may be only superficial. On a deeper level, the manager may cling to mores and norms of their own culture.

We may thus conclude that assuming cross- cultural training as a panacea to address all cultural immersion issues would be a very risky proposition .As advocated by Cascio(1995) the firms should plan for a recruitment pipeline with steps including ,resume to invitation, invitation to interview, interview to offer, offer to acceptance, and acceptance to report for work. It would be advisable for firms to move systematically in selecting the culturally appropriate individuals by following a schedule of placement activities instead of hurriedly dispatching ‘someone ‘at the ‘eleventh hour’.Pual (2005, p291) cites the example of Colgate-Palmolive of selecting managers for global assignments from India who were MBAs, were computer literates, knew one foreign language and had served abroad. It may, however, be remembered that motivating expatriates to accept and succeed at positions abroad requires a combination of carefully planned policies and incentives. Their stints abroad should not hinder their career progress.

REFERENCES

Belcourt Monica and Mc Bey Kenneth J.(2004). *“Strategic Human Resource Management”*, Thomson (Nelson).,

Cateora Philip R. and Graham JhonL.(2005) . *“International Marketing”* McGraw Hill.

Cascio Wane F.(1 995). *“Managing Human Resources ”*. McGraw hills.

Czinckota A. et al.(200 1). *"Global Business "*, Hartcourt College Publishers.
Daly Jhon L.(2006). *"Training in Developing Countries "*.Pentagon Presss.
Daniels Jhon D.and Redbaugh Lee H.(2001). *"International Business Environments* and Operations", Prentice –Hall Inc.
Deresky Helen.(2006). *"International Management: managing Across Borders and Cultures"*, Prentice Hall.
Fatehi Kamal(1996). *".International Management: A Cross Cultural Approach"*Prentice Hall.
Grosse Robert and Kujawa Duane.(1995). *"International Business"* Richard D., Irvin Inc. Kotabe
Masaaki and Helsen Kristiaan.(2000). *"Global Marketing Management*".Jhon Wiley & Sons..
Paul Justine.(2005). *"International Business "*, Prentice Hall Of India".

THE IMPACT OF DIVIDEND ANNOUNCEMENT ON SHARE PRICE OF OIL AND GAS MARKETING SECTOR OF PAKISTAN

FAUZIA MUBARIK

ABSTRACT

This study intends to focus on the impact of dividend announcement on the share price of the oil and gas marketing sector of Pakistan. It analysis the general perception of investors with a notion that share prices have significant association with the dividend announcement. A sample of five listed companies has been taken and studied upon twenty-one day event window (-10, + 10). The t-test has been applied on the average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) derived from company and market returns. The data have been collected through the websites of Karachi Stock Exchange and Business Recorder. For calculations, the Microsoft Excel has been used. The findings show a significantly negative impact of dividend announcement on the share price of oil and gas marketing sector of Pakistan.

INTRODUCTION

Dividend announcement plays a potential role in seeking investment by various investors. Usually, firms pay dividends in the form of cash or additional stock. Cash dividend may be as regular quarterly, semi-annual or annual payments depending upon the dividend policies. Some firms prefer paying a stock dividend in addition to cash dividend or in place of cash dividend. Therefore, the decision in the sale and purchase of shares is taken after the announcement of dividend payment schedule. Borokhovich, Brunarski, Harman and Kehr (2005) demonstrate that the dividend increase brings positive news for the shareholders. This increase is perceived as an increase in the current or future cash flows.

According to them, the firm with few growth opportunities may provide information that managers will waste flows on non optimal projects and those with high growth opportunities are compelled to use external capital markets for continuous growth to meet an increase in dividends.

As any activity within an organization is followed by a policy, thus the decision regarding dividend increase or decrease is also based on dividend policy. The dividend policy refers to the policy or guideline that management uses in establishing the portion of retained earnings that is paid in dividends. Miller and Modigliani (1961) argued that dividend is irrelevant to the choice between dividends and retained earnings. According to them, the dividend policy is irrelevant if the firm's capital investments and debt policy are fixed. Thus, the dividend payments can simply be financed by a combination of excess retained earnings and new equity financing if required.

It is usually observed that the dividend payment schedule is set by the firm's board of directors. On a particular date, the board votes to declare a dividend payment either in cash dividends or stock repurchases. This date is termed as the declaration date. After the declaration date, the payable date is decided by the board about the distribution of dividend payments. The firm then examines corporate records to determine the shareholders eligible for the payment of upcoming dividends on a particular date. This date is termed as the record date. Depending upon this record , an earlier date is announced for stocks being traded publicly that the new stock holder does not have the right to the upcoming dividend payments, This date is called as ex-dividend day or ex-day.

There are basically two determinants of a dividend policy that is the investment alternatives available to a firm and the capital gains or current yield preferences of its

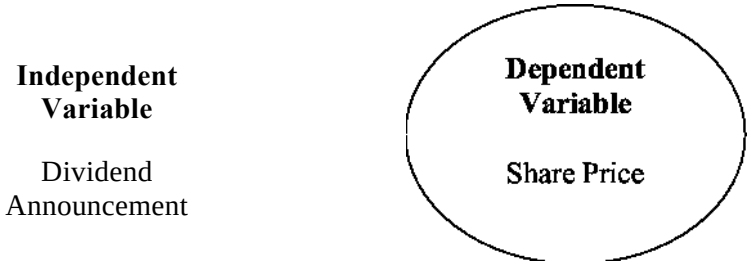
stockholders. The firm with limited investment opportunities prefers choosing high dividend payout ratio. According to Impson and Karafiath (1992), the share price increase pattern should be less for firms whose payout ratio increases with dividend increase.

Contrary to efficient market where prices fully reflect available information and no excess returns can be made from any such information, Pakistan has rather a semi efficient market where investors in market respond to the dividend announcements in order to make maximum profit from this information.

This study intends to focus on the impact of the dividend announcement on the share price of the oil and gas marketing sector of Pakistan. The data includes five marketing oil and gas companies listed at Karachi Stock Exchange. In a time span of August 2004 to February 2008, thirty-two dividend announcements have been made by various marketing oil and gas marketing companies of Pakistan.

A lag of ten days before and after the dividend announcements have been taken for data analysis. The data has been collected from the web sites of Karachi Sock Exchange and Business Recorder.

Hypothesized Diagram



The conceptual framework is designed around two variables which are the independent, and dependent variables. The dividend announcement is identified as the independent variable and share price as a dependent variable.Viera and Raposo, (2007) demonstrates that share prices have inverse relation with dividend announcements which is evident in numerous practical cases. They further stress that no such findings have been concluded to support the opinions and perception that changes in dividends have information contents about future earnings changes. Further, their findings do not support the assumption of dividend signaling hypothesis that dividend change announcements are positively related to future changes in earnings.

HYPOTHESIS DEVELOPMENT

H_1) There is significant association between the dividend announcement and share price.

As increase in dividend announcements is positive news for existing or new investors. The above hypothesis is raised to analyze the relation of the dividend announcement and share price. According to Cheng, Fung and Leung, (2004) earnings and dividend signals cannot be evaluated in isolation. Their findings conclude that market gets good response on any clear but good news and weak response on any clear but bad news. According to them, dividend usually has an influential impact on the market as it indicates sound future earnings of a firm. Their research is based on Hong Kong market, it gives a positive association between dividend announcement and share price because of the limited information available to the investors. This result has been concluded because the Hong Kong market is usually governed by concentrated shareholding family structures. This structural tie usually weakens the content of information regarding earnings.

It has been observed in Pakistan that the investors do not play a key role in identifying the information contents regarding dividend announcements of various firms.

LITERATURE REVIEW

John, Audun, and Andrew P., (2004) demonstrate that abnormal stock markets have significant relation with dividend increase and decrease by using the signaling theory. This theory holds that dividends direct or signal management to bring a permanent change in the future earnings of the firm and revaluation of the firm's shares. This valuation is observed as a market reaction which results from new technical information or a change in agency costs. To make this theory valid, the change in future earnings must be parallel with a change in dividend.

Acker, (1999) has studied the role of information in dividend cuts and raises regarding interim and final dividend announcements. He concludes that when dividends are cut, the interim dividends are perceived to be more significant than the final dividends and reverse for increase in dividends. Volatility in the dividend is expected to rise on the day of final announcement. Likewise the rise expected after an interim announcement of a cut in dividend is perceived to increase.

Lippert, Nixon and Pilotte, ((2000) conclude that the need of dividends is reduced with a purpose to reduce the agency costs based on high-pay performance sensitivity phenomenon. Their findings are concluded in effect of agency theory which shows that the price response to dividend inclination declines with pay-performance sensitivity and is usually evident in firms with low market-to-book ratios.

Tian and Zhang, (2006) conclude that after dividend announcement, a significant association is observed between dividend changes and the future earnings which is not long-term based. Secondly, it is observed in their study that dividend decrease has a larger negative influence on earnings growth than positive news. This effect is consistent with the infrequent occurrence of dividend reduction.

Sponholtz, (2005) stresses that stock marker reaction to dividend announcement has an association with an element of surprise involved in current dividend and future growth earnings predicted by management. As the future growth earnings are predicted, there is always a price reaction to dividend announcements.

According to Norris, (2000) a decline in dividend payment policies is being observed in most of the U.S. firms. These firms term dividends as unnecessary costs or overhead costs for the firms. Norris stresses that this decline in trend could be due to various reasons, the most important of which is the tax disadvantage. These dividends are taxable as ordinary income and are not deductible from corporate income which leads to double taxation. Secondly, most of the corporate officials prefer availing the stock options because they do not see any benefit in dividend payments. They further demonstrate that if the company gets short of cash then share repurchase could be reduced but a reduction in dividend payment affects the goodwill of the company. Similarly, the entry of huge capital gains in most U.S. firm has declined the need of dividends as an assured return if the market declines.

Buffet, (1984) demonstrated that shareholders prefer to employ retained earnings to expand the high-return business, with balance paid in dividends or by repurchasing stock. Their preference is justifiable as most of the times the retained earnings are employed in non-economic ventures which leads to failures in proper capital allocation and cash is utilized nowhere. He further discussed that shareholders of public corporations especially with long life prefer the dividends to be more consistent and predictable. Such condition is considered by them because of the reflection shown by such corporations on the consistent earnings and returns on incremental capital.

According to Elfakhani, (1998) the information content regarding dividend announcements of a corporation is floated to the market in two steps i.e. the accounting information and the dividend change announcement. He concludes that investors' assess the dividend announcement usually after the earning announcements and that the dividend announcements have direct impact on the share price.

Aharony and Swary, (1980) concluded that dividend announcement have direct impact on the stock price response i.e. the dividend increase with positive stock price response and decrease

with decrease in stock price. The dividend changes indicate the managers' private earnings information regarding the equity or wealth effects of dividend change announcements. Thus, this change at an increase on dividend announcement depends on the need of dividend to reduce agency costs and the authenticity of the signal provided by the dividend.

METHODOLOGY

This study includes the sample of five listed marketing companies of oil and gas sector of Pakistan. The data has been collected from the websites of Karachi Stock Exchange and Business Recorder. The data includes thirty-two available dividend announcements for a period August 2004 to February 2008. (Table1)

Twenty-one day event window has been used with a lag of tens days before and after the dividend announcements.

TABLE 1

YEAR	NO.OF ANNOUNCEMENTS	PERCENTAGE (%)
2004	3	9.375
2005	9	28.125
2006	9	28.125
2007	9	28.125
2008	2	6.25
TOTAL	**32**	**100**

In year 2004, three (3) dividend announcements have been made which is 9.375% of total. In year 2005, 2006 and 2007 28.125% announcements were made each year. In year 2008 6.25 1% dividend announcements were made.

The company returns and market returns for each company have been calculated. The returns have been calculated by the following formula;

$$\textbf{Return} = \frac{P_t - P_Y}{P_Y}$$

Pt stands for today's price
Py stands for yesterday's price
Further, the abnormal returns are calculated for 21-event window by using the following formula;

$$AR = R_C - R_M$$

AR stands for abnormal returns
R_C stands for company returns
R_M stands for market returns
Abnormal return is the difference between a single stock or portfolio's performance in regard to the average market performance over a set period of time. Further, average abnormal return (AAR) and cumulative average abnormal return (CARR) have been calculated to apply the t-test for data interpretation and analysis.
AAR is calculated by using the following formula;

$$AAR = \sim AR/N$$

CAAR is calculated by the following formula;

$$CAAR = \sim AAR$$

The following formulae have been used to calculate **t** values of AAR and CAAR

$$t_1 = AAR/s/¥N$$

$$t_2 = CAAR/s/¥N$$

Where,
s is the standard deviation calculated by the following formula, i.e. **s** =

$$\frac{\sim(x-x)^2}{N-1}$$

EMPIRICAL RESULTS

This section includes the interpretation and analysis of data by applying t-test on the twenty-one (21) day event window of thirty-two observations of the oil and gas marketing sector of Pakistan. The table below shows the calculated t-values of AAR and CAAR.

TABLE 2

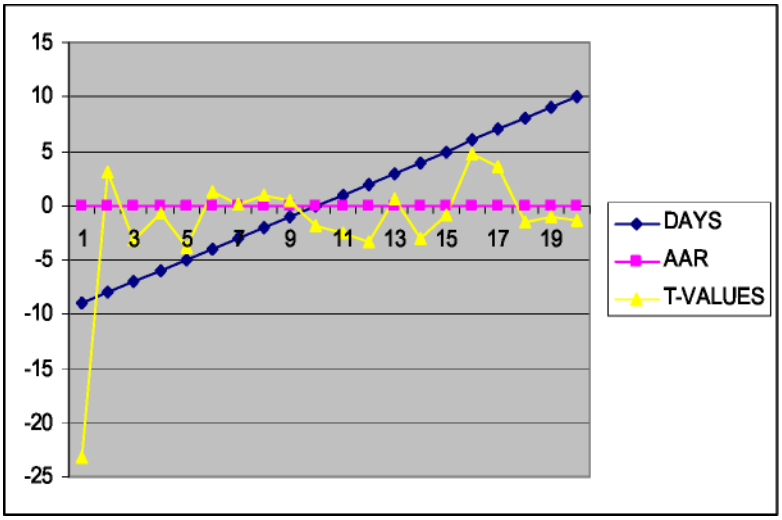
DAYS	AAR	T-VALUES	CAAR	T-VALUES
-9	-0.03155	-23.2485	-0.03155	-23.2498
-8	0.004155	3.061739	-0.02739	-20.1868
-7	-0.00423	-3.11651	-0.03162	-23.3033
-6	-0.00103	-0.76197	-0.03266	-24.0653
-5	-0.00517	-3.80885	-0.03783	-27.8741
-4	0.0018	1.32636	-0.03603	-26.5478
-3	0.000232	0.170877	-0.03579	-26.3769
-2	0.001296	0.955108	-0.0345	-25.4218
-1	0.000562	0.414374	-0.03394	-25.0074
0	**-0.00244**	**-1.80024**	**-0.03638**	**-26.8076**
1	-0.00336	-2.47606	-0.03974	-29.2837
2	-0.00465	-3.42528	-0.04439	-32.709
3	0.000891	0.656345	-0.0435	-32.0526
4	-0.00415	-3.05934	-0.04765	-35.112
5	-0.00124	-0.91622	-0.04889	-36.0282
6	0.006485	4.778826	-0.04241	-31.2494
7	0.004944	3.643091	-0.03746	-27.6063
8	-0.00212	-1.563	-0.03958	-29.1693
9	-0.00138	-1.01494	-0.04096	-30.1842
10	-0.00187	-1.37553	-0.04283	-31.5598

AAR is average abnormal return, CAAR is cumulative average abnormal return, t-values are t-statistics for AAR and CAAR (N=32). Significance Level 0.05
(-10th day observation is missing because -1 1$_{th}$ day data is not collected in the 21-day event window)

INTERPRETATION

The t-values for AAR and CAAR on the day of announcement (0th Day) clearly indicate a significantly negative impact of dividend announcement on share prices. It is clear because of the negative sign and the values less than two (2). The t-value of CAAR gives comparatively bigger values as compared to AAR because it is the accumulation of all the average abnormal returns.

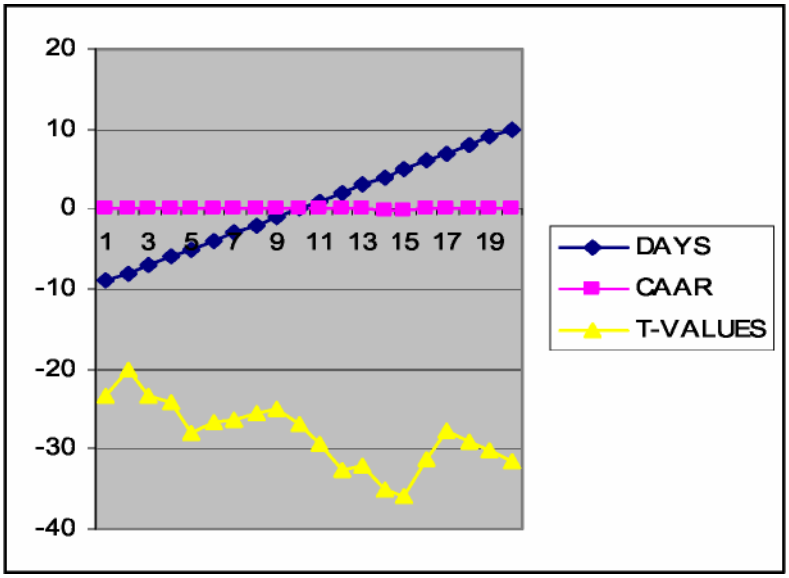
Similarly, the t-values on all other days except for day 6th and day 7th indicate a significantly negative impact of dividend announcements on the share prices.



Graphical Depiction of t-values of Average Abnormal Returns

The white line in the above graph indicates t calculated values of AAR. The haphazard line pointing more towards the negative values shows a weak relation between the dividend announcements and share prices. At the same time, the line that is pointing towards the positive values (most of which) are less than two (2) which again indicates a weak association between dividend announcements and share prices.

.On day 6th and 7th the t-values for AAR give a significantly positive response of share prices to the dividend announcements but the t-values of CAAR show the negative response of share prices to dividend announcements.



(Graphical Depiction of T- values of Cumulative Average Abnormal Returns)

The white line in the above graph indicates the t-values of CAAR ranging from minus twenty to -37. This clearly indicates a significantly negative association between dividend announcements and share prices.

CONCLUSION

Based on the findings, it can be concluded that share prices do not respond positively to the dividend announcements. The data indicates that dividend announcements and share prices

have weak and negative association with one another. Similarly some of the t-values of average abnormal returns in addition to having a negative sign are less than two (2) which indicates a weak relation of the dividend announcements and share prices.

As a matter of fact, if a company is earning negative average abnormal returns before dividend announcement, investors perceive it to continue in the same direction even after the dividend announcement as it signals the weak financial position of the corporation.

REFERENCES

Acker, D., 1999, 'Stock Return Volatility and Dividend Announcements', Review of Quantitative Finance and Accounting, Vol.12 (3), 221-243.

Aharony, J., Swary, I., 'Quarterly Dividend and Earnings Announcements and Stockholders' Returns: An Empirical Analysis', Journal of Finance, Vol.35(1), 1-12

Borokhovich, K.A., Brunerski, K.R., Herman, Y., Kehr, J.B., 2005, 'Dividends, Corporate Monitors and Agency Costs', The Financial Review, Vol.40, 37-65.

Buffet, W., 1984, 'Management and Empire Building', Excerpts; Annual Report of Berkshire Hathaway, Inc.

Elfakhani, S., 1998, 'The Expected Favorableness of Dividend Signals, The Direction of Dividend Change and the Signalling Role of Dividend Announcements', Journal of Applied Financial Economics, Vol.8(3), 22 1-230.

Impson, C.M., Karafiath, I., 1992, 'A note on the Stock Market Reaction to Dividend Announcements', The Financial Review, Vol.27(2), 259-271.

John, C., Audun, K., Andrew P, M., 2004, 'Share Price Reaction to Dividend Announcements: Empirical Evidence on the Signaling Model from the Oslo Stock Exchange', Mulinational Finance Journal.

Lippert, R.L., Nixon, T.D., Pilotte, E.A., 2000, 'Incentive Compensation and the Stock Price Response to Dividend Increase Announcements', Financial Review, Vol.35, 69-94. Merton H, M., Modigliani, F., 1961, 'Dividend Policy, Growth and the Valuation of Shares', Journal of Business, Vol. 34, 411-433.

Norris, F., 2000, 'Market Place: More Companies Decide Not to pay Dividends', The New York Times.

Sponholtz, C., 2005, 'Separating the Stock Market's Reaction to Simultaneous Dividend and Earnings Announcements', Working Paper Series, No. 212

Tian, G., Zhang, H., Cao, Y., 2006, 'Dividend changes and Future Earnings Performance: Evidence from UK Market', Journal of Modern Accounting and Auditing, Vol.2 (2), Serial No (9).

www.efmaefm.org (updated Jan 07)) Vierra, E., Raposo, C., Signaling with Dividends, The Signaling effects of Dividend Change Announcements: New Evidence from Europe. www.fma.org (updated 15/11/04) Cheng, L.T.W., Fung, H.G., Leung, T.Y., Information Effects of Dividends: Evidence from the Hong Kong Market.

Corporate Governance and Capital Structure Decisions of the Pakistan Listed Textile Firms

Ishtiaq Ahmad

ABSTRACT

This paper studies the relationship between some characteristics of the corporate governance and the firm 's capital structure in Pakistan listed textile firms. The findings provide some preliminary empirical evidence that managers tend to pursue higher financial leverage when they face stronger corporate governance from the board. However, the empirical results of the relationships will be statistically significant only in the case of the CEO compensation and the CEO tenure. The results are also statistically insignificant in the case of the board size and board composition.

KEY WORDS

Corporate governance, capital structure, board size, board composition, CEO tenure, CEO compensation, Return on asset, Leverage, managerial equity, Pakistan Textile firms.

INTRODUCTION

The model which I am using to examine this relationship has been taken from the *"Corporate Governance and Capital Structure Decisions of the Chinese Listed Firms,"* written by Yu Wen*, Kami Rwegasira and Jan Bilderbeek.

This paper empirically investigates the relationship between corporate governance and the capital structure of Pakistan textile sector. The data used in the analysis is extracted from the financial reports and the web sites of the listed textile firms on the local stock exchanges. Multiple regression model is used to analyze the data. The results reveal that the relationship between the capital structure and board characteristics statistically significant only in the case of CEO compensation and the CEO tenure.

Several studies have already been conducted on testing the hypothesis of association between capital structure and the main characteristics of corporate governance, which include board size, board composition, management compensation, the tenure of directors and managers, managerial equity proportion etc. *(Friend and Lang,* 1988; *Berger et al.,* 1997).

In this study, I intend to investigate empirically whether any relationships exists between some selected characteristics of corporate governance and the firm's capital structure in Pakistan listed textile firms. I also evaluate whether, and how closely corporate governance might possibly be interacting with the firm's capital structure.

This study examines the relationships between the levels of various corporate governance variables and firm's debt to total asset ratios based on 36 Pakistan listed textile firms studied between 2002 to 2004. The empirical results suggest a higher leverage in firms when the board of directors is large, or when there is a low proportion of outside directors on the board of directors, or when the tenure of the Chief Executive Officer (CEO) is longer and the salaries and bonuses of CEO are higher. The empirical results of relationship between financial leverage on the one hand, and the CEO compensation or tenure of the CEO on the other, are statistically significant. But the relationships are not statistically significant in the case of variables related to board size and board composition.

LITERATURE REVIEW

David J. Denis (1995) have searched that several academic studies have documented significant shareholder gains and operating improvements following highly leveraged transactions. These gains are generally attributed to changes in the incentive, monitoring, and governance structures of the firms. The results suggest that while high leverage is important in giving managers the incentive to generate cash, higher managerial ownership of shares and improved monitoring from the board of directors are important in ensuring that cash is generated in a way that maximizes returns to shareholders.

Julie Cotter and mark Silvester (2003) have documented a strong positive association between the proportion of independent directors on the full board and its audit and compensation committees.

Andrew K. Prevost, Ramesh P.Rao and Mahmud Hossain (2002) has reported that CEOs who are also board chairs and / or company founders are associated with a lower proportion of outside directors. While they were unable to compare this result to an earlier period, then suspected that dual-position CEOs may have retained some ability in control board composition in favor of inside directors in the 1 990s, particularly in smaller firms.

Jay C. Hartzell,* Libo Sun** and Sheridan Titman*** (2006) have analyzed that Institutional ownership had a stronger association with changes in debt, while insider ownership was significant for both sources of capital.

Pfefer and Salancik (1978) found that there was a significant relationship between leverage and both board size and composition, whereas *Jensen* (1986) states that firms with higher leverage have larger boards and relatively more outsiders, which possibly reflects one way in which debt can act as monitoring device.

On the contrary, in *Berger et al.* 's (1997) paper, leverage wad lower when the board of directors where larger. But lower leverage was related to a low fraction of outside directors in their empirical result, which was similar to the evidence of *Jensen* (1986). Berger et al. (1997) also indicated that leverage was lower when the CEO had a long tenure in office.

Scott W. Barnhart and Stuart Rosenstein (1998) had suggested that institutional ownership and board composition were substitutes for managerial ownership, and that managerial ownership has a greater effect on board composition than vice-versa. It also appears that strong performance may allow insiders to retain control of the board of directors.

John and *John* (1993) studied the interrelationship between top-management compensation and design and the mix of external claims issued by a firm and found a negative relationship between pay-performance sensitivity and leverage.
In the following sections of the paper, I will present the variables and hypothesis will be used, the sample, as well as the empirical results of multiple regression model, and the interpretation.

METHODOLOGY

Several variables are being used for analysis of leverage levels and corporate governance characteristics and derivation of the relevant hypothesis.

Leverage is the dependent variable in regression model. The level of leverage at year end will be calculated by dividing total debt and total assets using the data of annual reports.

Leverage (book value) = total debt (book value) ÷ total assets (book value).

The board size is the important determinant of corporate governance effectiveness. The first variable in my analysis is the board size that will be measured in a log specification. *Jensen* (1986) finds that firms with higher leverage have a larger board size. On the contrary, in *Berger et al.* (1997), leverage is lower when the board of directors is larger. Accordingly for this it is proposed that

"Leverage is negatively related to the board size"

Board composition is another very important determinant of corporate governance effectiveness. This variable will measure the percentage of outside directors in the board. The top manager face more rigorous monitoring when the board of directors is controlled by independent outside directors. The outside directors monitor managers more actively, in order to adopt high leverage to exist the performance pressures associated with commitments to disgorge large amounts of cash *(Jensen,* 1986). Therefore it is hypotheses that:-

" Leverage is negatively related to the percentage of outside directors on the board."

The variable use will measure the Chief Executive Officer (CEO's) years in that position. Tenure of CEO will be measured in log specification. This variable will reflect the likelihood that the CEO's control over international monitoring mechanisms increases as the tenure lengthens. Berger et al. (1997) have identified that tenure of CEOs is negatively related to the leverage. The entrenched CEOs and directors prefer low leverage to reduce the performance pressures accompanying high debt. Therefore, the study postulate that

"Leverage is negatively related to the tenure of CEO"

In this model, I will use salary and bonus payments, which will be measured in log specification. Managers with good fixed compensations might pursue lower leverage to reduce the financial risk and keep their job for its good salary and bonus *(Harris and Raviv,* 1988; *Stulz,* 1988), it is postulate that

"Leverage is negatively related to the CEO's fixed compensation."

CONTROL VARIABLES

The independent variable is the model to influence leverage are as follows: -

(i). Return on Asset (ROA) variable = Earning before taxes, divided by total asset at the end of year to control for firm profitability.

(ii). Company Size = book value of assets (the log of total assets)

(iii). Asset Collateral Value = Net property, plant & equipment + inventory) ÷ total asset

(iv).

SAMPLE SELECTION

A sample of 108 observations for 36 Pakistan listed textile firms between 2002 to 2004. When all data has been collected for annual reports. Sample selection was based on convenient

sampling. Table 1 lists the definitions of all the dependent and explanatory variables for an analysis of company leverage levels. Table 1 also presents sample-wide means and standard deviations, sample correlation between the explanatory variables and leverage measure.

Table 1 Descriptive Statistics of dependent and independent variables

Dependent Variable	**Definition**	**Mean**	**SD**
Leverage (book values)	Total debt (book value) ÷ total assets	.6984	.3572

Explanatory Variables	**Definition**	**Mean**	**SD**	**Correlation with leverage**
Board Size	Log (number of directors of board)	0.8556	0.0267	-0.0876
Board Composition	% outside directors of board	0.4259	0.5153	-0.0122
Tenure of CEO	Log (year in CEO position Log)	0.4146	0.1497	0.0933
CEO compensation	(salary and bonus of CEO	3.9268	2.8050	0.2645
Asset Uniqueness (1)	Research & development ÷ Sales	0.0000	0.0002	-0.0730
Asset Uniqueness (2)	Selling & general ÷ Sales	0.3976	1.1697	0.0937
Asset Collateral Value	(Net property, plant & equipment + Inventory) ÷ total asset	0.6280	0.2248	0.3183
Return on assets	EBIT ÷ total assets	2.1204	10.8504	-0.4037
Company Size	Log (total asset)	3.0434	0.5380	-0.3847

Note: Definition and descriptive statistics for variables used in analysis of capital structure levels. The sample generally consists of 108 observations for 36 firms at the end of 2002 to the end of 2004. Financial statement variables were obtained from data of annual reports. Corporate governance variables were also obtained from data of annual reports.

MULTIPLE REGRESSION ANALYSIS RESULTS AND INTERPRETATION

Table 2 presents the OLS regression results of models of leverage levels.

Table 2 : Regression Co-efficient Estimates

Leverage (book Coefficients		t-Statistics Value)
Intercept / Constant	0.14187	-0.14067
Board Size (Board of directors)	0.52070	0.4298 1
Board composition (% outside directors of board)	0.02143	0.37056
Tenure of the CEO in the office	1.40720	2.23597
Fixed compensation of CEO	0.03 104	2.78265
Asset Uniqueness 1 (R & D / sales)	3.30781	0.01764
Asset Uniqueness 2 (Sales & Admin expenses / sales)	0.01703	0.67 156
Asset Collateral Value (net PPE + Inventory)/total assets}	0.20473	1.32738
ROA (EBIT/Total asset)	-0.00905	-3.05396
Company Size (Total Asset)	-0.16547	-2.48834
R- Squared	0.34537	
F-statistic	5.7448	

On the basis of finding it is reported that board size has positive (beta 0.52070) but not statistically significant (t-0.4298 1) association with financial structure of the firm. According to the Code of Corporate Governance, 2002 of Securities and Exchange Commission of Pakistan "All listed companies shall encourage effective representation of independent non-executive directors, including those representing minority interests, on their Board of Directors so that the Board as a group includes core competencies considered relevant in the context of each listed company." In my analysis board composition is also positively (0.02 143) correlated with the leverage but again the association is not significant (t-0.37056) enough to accept or reject the stated hypothesis. The underlining rationale is, that the financial structure decisions are normally made by executive directors, we dominating controlling individuals. Therefore, it can be figured out that board size and board structure have no substantial impact on the financing decisions. On the basis of these findings it can also be envisaged that executive board and dominant controlling individuals are more relevant to capital structure decisions.

According to Code of Corporate Governance, 2002 "appointment, remuneration and terms and conditions of employment of the Chief Executive Officer (CEO) and other executive directors

of a listed company are determined and approved by the Board of Directors;" and "the tenure of office of directors shall be three years. Any casual vacancy in the Board of Directors of a listed company shall be filled up by the directors within 30 days thereof." It is found that statistically significant positive association exists between leverage and tenure of CEO at 95% confidence level. It is also reported that there is a positive association between fixed compensation of CEO and leverage at 99% confidence level. It can be figured out in more detail that CEO tenure and CEO compensation have positive relationship (1.40720, 0.03104) and statistically significant (2.23597, 2.78265) respectively. Though results are not fully consistent with previous research but are consistent with Pakistan's corporate culture, where companies are group owned or family owned enterprises.

The directors of listed companies shall exercise their powers and carry out their fiduciary duties with a sense of objective judgment and independence in the best interest of the listed company.

Therefore, the business entity is dominated by individuals on the board. Another reason worth noting and consistent with our statement is that long term debt securities market is not mature. Firms have to use other nontraditional sources of debt financing. The positive relationship of CEO tenure with leverage envisages that long tenure of CEO is proxy of CEO's commitment toward organization i.e. matter of concern for debt financers. Most of the studies on capital structure reveal that the vision of CEO is an important factor for financial structure decisions. The results also confirm this relationship.

Overall the results are not consistent with null hypothesis therefore, alternative hypothesis are accepted in all cases with the exception that relationship is not empirically significant in case of board size and board structure.

SUMMARY AND CONCLUSIONS

In this paper, I have studies the association between the capital structure and some characteristics of corporate governance in Pakistan's listed textile firms. The testing of associations between capital structure and some characteristics of corporate governance is based on 36 Pakistan listed textile firms from 2002 to 2004.

The empirical results show that there is no significant association in case of board composition and board size, the reason may be that corporate governance practices are not in force with true spirit.

The results about the relationship between capital structure and some characteristics of corporate governance suggest that managers seek higher leverage when they face stronger corporate governance. These results illustrate that managers who face stronger corporate governance might pursue higher debt levels to take advantage of tax shield due to the employment of debt as their major source of financing.

However, the findings indicate that relationships between the capital structure and board characteristics are statistically significant only in the case of CEO compensation and the CEO tenure.

Due to the dominance of CEO as in most cases two variables under study regarding CEO tenure and compensation have significant impact on leverage decisions.

REFERENCES

Andrew K. Prevost, Ramesh P.Rao and Mahmud Hossain, "Board Composition in New Zealand: An Agency Perspective"Journal of Business Finance & Accounting 29 (5) & 6 June/July, 2002.

Bathala, C. T., and R. P. Rao, *'The Determinants of Board Composition:* An Agency Theory Perspective', Managerial and Decision Economics, Vol. 16, No. 1, 1995.

Baysinger, B. D., and H. N. Butler, *'Corporate Governance and the Board of Directors: Performance Efects of Changes in Board Composition'*, Journal of Law, Economics, and Organization, Vol. 1, 1985.

Baker, George P., Michael C. Jensen, and Kevin J. Murphy, 1988, *"Compensation and incentives"* Practice vs. theory, *Journal of Finance* 43, 593–616.

Berger, P.G., Ofed, E. and Yermack, D.L. (1997) *"Managerial Entrenchment and Capital Structure Decisions "*, Journal of Finance,

David J. Denis, *"The Benefits of High Leverage ":* Lessons from Kroger's Leveraged Recap and Safeway's LBO Journal of Applied Corporate Finance winter 1995, Vol. 7.4

Friend, I. and Hasbrouck, J. (1988) "Determinants of Capital Structure." In Andy Chen (ed.) Research in Finance, Vol.7. New York: JAI Press, 1-19

Friend, I. and Lang, L.H.P. (1988) *"An Empirical Test of the Impact of Managerial Self-Interest on Corporate Capital Structure, "* Journal of Finance.

Hermalin, B.E. and M.S. Weisbach, 1988. "The determinants of board composition" *Rand Joumul of Economics Vol.* 19.

Jay C. Hartzell,* Libo Sun** and Sheridan Titman** * *"The Efect of Corporate Governance on Investment: Evidence from Real Estate Investment Trusts"* 2006 V 34 3: PP. 343–376 Real Estate Economics

Jensen, M.C. and Meckling, W.H. (1976) *"Theory of the Firm: Managerial Behavior, Agency Costs and Capital Structures,"* Journal of Financial Economics

John T.A. and John, K. (1993) *"Top-Management Compensation and Capital Structure,"* Journal of Finance.

Jensen, M.C (1986) *"Agency Costs of Free Cash Flow, Corporate Finance, and Takeover,"* American Economic Review.

Julie Cotter and Mark Silvester, *Board and Monitoring Committee Independence,* Abacus, *Vol. 39, No. 2, 2003*

Michael J. Murray and Frank C. Reid, Continental Bank "Financial Style and Corporate Control" Journal of Applied Corporate Finance, Spring 1988, Vol. 1.1

Pfeffer, J. and Salancik, G.R. (1978) The External of Organizations: A Resource-dependence Perspective New York: Harper & Row

Scott W. Barnhart *Florida Atlantic University* Stuart Rosenstein" University *of Colorado at Denver "Board Composition, Managerial Ownership, and Firm Performance ":* An Empirical Analysis the Financial Review 33 (1998) 1-16

Tim C. Opler, Michael Saron and Sheridan Titman, *"Designing Capital Structure to Create Shareholder Value"* Journal of Applied Corporate Finance, Spring 1997, Vol. 10.1

Yu Wen*, Kami Rwegasira and Jan Bilderbeek, *"Corporate Governance and Capital Structure Decisions of the Chinese Listed Firms," The Journal* International Review

Appendix A

Legal and listing requirements imposed on Pakistani firms.

A. The firms must hold the shares, which are publicly issued to society. The issuance of shares must be approved by the Securities Exchange Commission of Pakistan (SECP).

B. The firms cannot have false record on their financial reports or have taken part in illegal activities.

C. The firm must abide by other regulations of the SECP.

D. The firms applying to be listed must submit relevant documents to the SECP for approval. The SECP will approve the firms that are in compliance with the listed requirements. After the firms are approved to be listed by SECP, the listed firms must publish their shares and related reports for the general public.

E. The shares of firms can be traded on the exchange after the approval.

F. The listed firms must publish the financial status and operations result according to the laws and regulation. The listed firms must publish the financial reports annually.

The Impact of Knowledge Management on Organizational Effectiveness

Faid Gul

ABSTRACT

Many organizations are trying to improve generation and utilization of knowledge. The activities associated with these eforts are identified as organizational knowledge management (KM). The purpose of this study is to provide a more thorough assessment of the link between existing knowledge and organizational efectiveness. The result shows that organizations with better KM are more efective and eficient in many areas of performance. Organizations with better KM are more successful in bringing innovations and developing new products. Such organizations are more competitive and proactive to any change in the environment and customers' taste. Knowledge is seen as a driver for the definition and development of an organizational strategy and a key determinant of sustainable organizational competitiveness. Organizations with better KM face relatively less turnover as they respond quickly and efectively to the diverse needs of employees.

INTRODUCTION

For many years, organizational knowledge has been stored through several means like human mind, documents, policies, and procedures, and then shared among individuals through conversations, training, apprenticeship programs, and reports. Clearly, knowledge management (KM) is not a new phenomenon. However, the importance of knowledge has grown considerably in recent times (Sabherwal & Becerra-Fernandez, 2003).

It is widely acknowledged that developed economies have gradually been transformed over the past fifty years. Scholars and observers from disciplines as disparate as sociology, economics, and management science generally agree that knowledge has been at the center of this change. Knowledge can be defined as information that has been combined with experience, context, interpretation, and reflection (Davenport, De Long, & Beers, 1997). Malhotra (1997) as cited in *Maeil Business Newspaper of February 19, 1998,* defined Knowledge Management as: "Knowledge Management caters to the critical issues of organizational adaptation, survival and competence in face of increasingly discontinuous environmental change. Essentially, it embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies and the creative and innovative capacity of human beings".

In today's global economy, driven by intense competition, rapid innovation, and short product life cycles, what an organization knows and how rapidly it learns are becoming as important as what it currently produces (Nonaka, 1994). Moreover, the speed at which knowledge is effectively transferred within an organization can significantly affect its competitive ability and business performance (Szulanski, 1996).

Given the value of this asset to organizations, it is not surprising that greater attention is being paid to the subject of knowledge: how does it differ from the related concepts of information and data? How to begin to create, transfer, and use it more effectively? The subject of knowledge management, in particular, has had a recent flowering. Unfortunately, discussions of knowledge, its use, and management too easily devolve into highly abstract musings on the importance of knowledge, or on the emergence of knowledge-based economies and organizations. Nevertheless, for many industries the importance of knowledge as the basis of future competition is well established. Setting hyperbole and theoretical fantasies aside, the question now is: How do organizations actually begin using knowledge more effectively? (Davenport, De Long, & Beers, 1997)

LITERATURE REVIEW

Effective knowledge management is neither panacea nor Bromide; it is one of many components of effective management. Sound planning, savvy marketing, high-quality products and services, attention to customers, efficient structuring of work, and thoughtful management of a firm's human resources-none of these is diminished in importance by the acknowledgement that knowledge is critical to success and needs to be managed. At the margin, however, when a firm is faced with competitors that already perform well on these other dimensions, the difference between success and failure may well depend on how effectively an organization manages its knowledge (Davenport, De Long, & Beers, 1997).

A key distinction made by the majority of knowledge management practitioners is the distinction between *tacit* and *explicit* knowledge. The former is often subconscious, internalized, and the individual may or may not be aware of what he or she knows and how he or she accomplishes particular results. At the opposite end of the spectrum is conscious or explicit knowledge - knowledge that the individual holds explicitly and consciously in mental focus, and may communicate to others. In the popular form of the distinction tacit knowledge is what is in our heads, and explicit knowledge is what we have codified (Wikipedia, the free encyclopedia).

According to Edmondson, Winslow, Bohmer, & Pisano (2003) improvement rates across organizations are more heterogeneous for dimensions of performance that rely on tacit knowledge than for those that rely on codified knowledge. In organizations, relying on tacit knowledge, group membership stability is a vital factor in predicting improvement rates. When performance improvement relies on codified knowledge, later adaptors improve more quickly than earlier adaptors, as they learn from the experiences of earlier adaptors. As codified knowledge is more effective, so, whenever possible, organizations should codify their tacit knowledge to get maximum benefit from it. Nonaka and Takeuchi (1995) argued that a successful KM program needs, not only to convert internalized tacit knowledge into explicit codified knowledge in order to share it, but also, for individuals and groups to internalize and make personally meaningful codified knowledge once it is retrieved from the KM system. Bogner & Bansal (2007) suggested that there are three components to knowledge management systems that influence firm performance: the firm's ability to produce new knowledge, its ability to build on that knowledge, and its effectiveness in capturing a high proportion of the subsequent spin-offs.

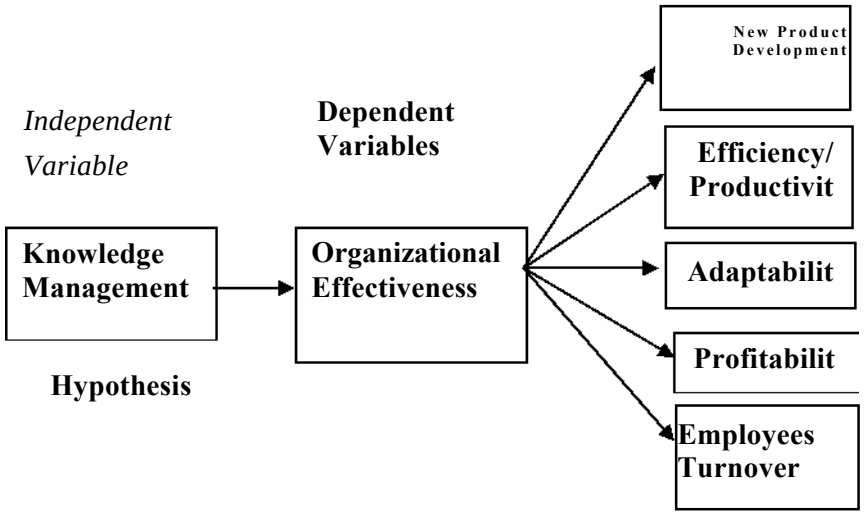
The most important driver of knowledge management is to gain the competitive advantage that comes with improved or faster learning and new knowledge creation. Knowledge management programs may lead to greater innovation, better customer experiences, consistency in good practices and knowledge access across a global organization, as well as many other benefits, and knowledge management programs may be driven with these goals in mind (From Wikipedia, the free encyclopedia, Accessed Mar. 13, 2007).

Appropriate knowledge structures enable managers to make effective decisions and solve problem more quickly. As managers are dealing with complex and ambiguous world, the quality and appropriateness of their knowledge structures come to centre stage. Inappropriate knowledge management structure within an organization may result in information overload while outsourcing it will results in organizational memory loss (Sparrow, 1999). Therefore it is important to manage knowledge in-house to reap its greater benefits.

An organization's ability to collect, store and use knowledge it has generated through experience has important consequences for its performance. Storing and then using knowledge effectively can buffer the organization from disruptive effects of turnover, facilitate co-ordination, contribute to the development of innovative products and may even serve to rebuild an organization. Providing access to dispersed experiential knowledge reduces the organization costs of repeatedly developing solutions to common problems (Olivera, 2000). Effective

knowledge management significantly reduces misunderstandings resulting in huge losses, when a change is being introduced in organizations (Weick, 2002). In a recent research, conducted by Bogner & Bansal (2007) it was found that knowledge management based on exploiting past innovations motivates higher growth and profitability. Theoretical Framework

In my research model I used Knowledge Management (KM) as an Independent Variable as the construct Organizational Effectiveness is explained by five variables I chose those which likely to have a direct relationship with KM.



As historical data along with current environmental scanning help organizations to exploit any opportunity I theorized that those organizations with better KM systems are better able to develop new and innovative products and market them successfully. Such organizations are better able to tap any change in customers' taste and respond to it quickly.

H1: Better KM result in developing better and innovative products.

About efficiency and productivity, I theorized that efficiency and productivity are high in those organizations that have better KM systems and use their historical memory more effectively. This is true because organization will be able to avoid? inventing the wheel, time and again. Specifically new employees can use historical data to know the processes quickly. There will be relatively little loss of time and resource wastage.

H2: Better KM result in greater efficiency and higher productivity.

Now-a-days change is the most common challenge faced by all organizations throughout the world and the success of organizations depend upon how effectively they are adapting to change. So, flexible and timely adaptability to any change in the environment is a true test of an organization's effectiveness. Better KM systems provide timely information about any change taking place in the external as well as the internal environment. Therefore, I theorized that organizations with better KM adapt to such changes more effectively.

H3: Better KM result in quick and effective adaptability to change.

Investors and other stakeholders will regard a system as effective only when it brings higher financial performance to the organization. As mentioned earlier that organizations with better KM have higher efficiency and productivity. Since better KM will result in low production cost, therefore, I theorized that better KM brings higher profitability to organizations.

H4: Better KM result in higher profitability for organizations.

Human capital is considered as one of the irreplaceable asset of organizations. It is actually the human capital that brings higher efficiency and productivity. Employees' satisfaction is very important for higher productivity. Employees' turnover is a good measure of checking their satisfaction level in the organization. Organizations with higher turnover ratio are the least effective both in financial and non-financial terms. If the turnover rate is high then the

efficiency and productivity will also be low. The reason is obvious, as the new employees will take some time before they get familiar with the processes. Since better knowledge management will not only enable organizations to adapt to external environment but also to internal environment. Such organizations are better able to fulfill the needs of their employees; Therefore, I theorized that organizations with better KM face low turnover.

H5: Better KM result in lower turnover rate of employees.

DATA COLLECTION AND RESEARCH DESIGN

To justify my hypothesis I collected data from secondary sources. I used the available literature in the field of KM and organization effectiveness. Mostly my emphasis, in literature, was either on KM or organizational effectiveness. I identified links between the two, using historical data. Historical research was used to test the impact of KM on any one of the dependent variables. I brought these variables together and used their individual findings to justify my hypothesis. It is a descriptive study that compiles the available research about KM and its impact on organization effectiveness in one place. No statistical tool has been used in my research. Rather I used the rich literature available on the underlying subject to justify it descriptively.

DISCUSSION AND ANALYSIS

Organizational effectiveness is achieved through a synergistic integration of a knowledge-sharing culture and technological resources (Galliers, 2002). The agility and competitiveness of organizations are dependent upon their ability to leverage their intangible assets. Knowledge is a key determinant of corporate value, therefore, organizations must be able to identify, manage and measure it.

To maintain their competitive edge, organizations need to build their intellectual capital and mushroom their knowledge management initiatives. These initiatives require an enabling environment that encourages employee involvement in social processes of knowledge creation. Organizations should:

1. Create a culture of employee involvement
2. Create a supportive and collaborative culture
3. Communicate company strategy clearly
4. Align knowledge networks within the organization with corporate strategy
5. Align HRM processes – starting with recruitment and selection processes - with knowledge management philosophy.
6. Build an inclusive culture that encourages employee participation across all hierarchies.
7. Provide appropriate IT/IS infrastructure and other media to facilitate the codification, diffusion and transfer of knowledge
8. Create and maintain easy-to-use "knowledge maps" (These points are taken from an article by Khusro & Sobiah, 2005).

When a firm reconfirms that knowledge management and core competencies are at the heart of organizational performance, they also recognize the need to further develop core competencies and to create and manage knowledge. Organizations striving to move toward a learning orientation but maintain flexibility in the face of complexity may do well (Halland Croasdell, 2005).

(KM Plays potential role in making knowledge a directly productive force both by collectivizing knowledge and learning and by increasing the firm’s access to distributed knowledge through its ability to overcome both internal and external organizational boundaries.) These espoused features of KM suggest that it represents a significant development in management practices, providing, for the first time, a systematic application of knowledge to the generation of knowledge. As such KM has important implications for the management of human resources, particularly in terms of development of knowledge sharing. Knowledge sharing is an increasingly prevalent ingredient in the innovation process (Scarbrough, 2003)

Innovations arise at the intersection between flows of people and flows of knowledge (Starbuck, 1992). In particular, KM's possible contribution to innovation has been seen by a number of large multinationals in terms of facilitating knowledge-sharing across geographical and cultural boundaries (Hedlund, 1994).

KM as a response to changes in the innovation process

The changing nature of the innovation process is well evoked by Castells' (1996) claim that the human mind is now "a directly productive force" rather than an element of a production system. In this view, knowledge has, to a significant degree, been liberated from the physical and structural constraints of the existing division of labor in organizations. One result of this new relationship between knowledge and productive activities is the challenge that it poses to traditional views of innovation. Innovation processes were traditionally predicated on a strict demarcation between the roles played by different groups, and therefore different bodies of knowledge, according to their place in the division of labor. As a result, the innovation process itself was seen as segmented between different "stages" according to the groups and forms of knowledge involved (Rothwell, 1986). Importantly, the designers of innovation were seen as distinct from the "users", and the process itself involved the progressive objectification of an original idea into a specific product or production template (Clark and Fujimoto, 1989). When knowledge is freed from physical and structural constraints, however, the activities, sequencing and actors encompassed by the process of innovation undergo a corresponding transformation. Broadly, innovation operates on a more distributed basis, with a wider range of groups inside and outside the organization becoming involved.

Networks play a crucial role in linking these groups (Swan *et al.*, 1997). The process becomes less linear and more interactive as the demarcations between users and designers are blurred (Von Hippel, 1988).

Increasingly, innovation is seen as the integration of knowledge with action, in the sense of blending the specialist knowledge of a range of groups into specific outcomes of either product or process change. Implementation is thus seen as an integral element of innovation (Leonard-Barton, 1988).

According to Khusro & Sobiah (2005) Knowledge Circles encourage knowledge creation through employee interaction and overcome organizational silos to provide opportunities for the cross-fertilization of knowledge within the organization. Knowledge Circles cut across horizontal, vertical, and organizational boundaries to facilitate continuous process improvement and innovation. This tool has the potential to build the critical mass required for continual improvisation and innovation, thereby, launching the organization on a prolonged growth trajectory.

Sabherwal & Becerra-Fernandez (2003) found in an empirical study at *John F. Kennedy Space Center of the National Aeronautics and Space Administration (KSC), USA* that KSC has been encountering increased turnover through effective knowledge management processes. Abdel-Aziz and Wahba (2005) found in a case study that a high turnover damages an organizational memory system. To counter the problem they recommend that the company should create a Chief Knowledge Officer position. This suggests that better knowledge management can help organizations to counter the problem of high turnover.

Senge (1990) discussed the concept of generative learning, which is about adaptive learning and coping with accelerating pace of change. KM process involves helping the recipients *adapt* to change and apply it to new situations, to create new 'knowledge' and put it into action (O'Dell *et al.*, 1998). A learning organization looks for differences between its actual and expected results and tries to correct the errors that have caused the difference. This type of company seeks to improve its actions through acquiring knowledge and understanding. It not only captures knowledge but also utilizes its ability to respond and adapt to changing organizational environments (Hashim and Othman, 2003).

In a case-study of *Infosys Technologies Limited,* Mehta and Mehta (2005) noted that effective KM results in higher revenue growth as well as higher stock performance. Its stock out performed both S & P 500 index and NASDAQ from 1997-2002.

CONCLUSION

This paper reviews historical research available in the field of KM and its impact on organizational effectiveness. On the basis of historical research findings I conclude that better KM and KM systems have a direct relationship with an organization's effectiveness. Organizations with better KM and KM systems outperform other organizations both in financial as well as non-financial terms. Such organizations have higher returns on investors' capital, revenue growth, stock performance on secondary market and profit margins.

They also effectively (quickly and flexibly) adapt to changes, develop and market innovative products successfully, have higher efficiency/productivity and lower turnover.

Employees are more satisfied and therefore have higher motivation level. These organizations have lower level of resource wastage, therefore, are able to provide higher quality to customers at lower cost. So, customers are also satisfied with their products and services. These organizations have superior information systems. Therefore, they can communicate effectively with their suppliers of raw materials. All this combines to form organizations that are effective in all respects.

REFERENCES

Abdel-Aziz, H., and Wahba, K., (2005). A Case Study on Assessing the Readiness of Professional Services Company to Build an Organizational Memory Information System. *Idea Group Inc.*

Afsoun, H., Robert, D. G., (2005). Exploring the Impacts of Knowledge (Re)Use and Organizational Memory on the Effectiveness of Strategic Decisions: A Longitudinal Case Study. *Idea Group Inc.*

Amy, C. E., Ann, B. W., Richard, M. J. B., and Gary, P. P., (2003). Learning How and Learning What: Effects of Tacit and Codified Knowledge on Performance Improvement Following Technology Adoption. *Decision Sciences.* Vol. 34. No. 2. USA.

Castells, M., (1996). *The Rise of the Network Society,* Blackwell, Oxford.

Clark, K. B. and Fujimoto, T., (1989). Overlapping problems-solving in product development. Managing International Manufacturing. North-Holland, Amsterdam, pp. 127-52. Fernando, O., (2000). Memory Systems in Organizations: An Empirical Investigation of Mechanism for Knowledge Collection, Storage and Access. *Journal of Management Studies,* Blackwell Publishers, UK & USA.

Hall, D. J., and Croasdell, D., (2005). Inquiring Organizations: An Organizational Form Perspective. *Idea Group Inc.*

Hashim, N. A., and Othman, R., (2002). Organizational amnesia: The barrier to organizational learning. *Proceedings of the 3rd Annual Conference on Organizational Knowledge, Learning and Capabilities,* Athens, Greece.

Hedlund, G., (1994). A model of knowledge management and the N-form Corporation. *Strategic Management Journal,* No. 15, pp. 73-91.

Jens, R., (2000). The concept of human error: Is it useful for the design of safe systems in healthcare? In. C. Vincent and B. De Moll (Eds.), *Risk and Safety in Medicine,* pp. 31-48. Pergamum, Amsterdam.

Karl, E. W., (2002). Puzzles in Organizational Learning: An Exercise in Disciplined Imagination. *British Journal of Management,* Vol. 13. S7-S15, British Academy of Management, UK.

Khusro, P. M., and Sobiah, M., (2005). Value Creation Role of Knowledge Management. *Pakistan Institute of Quality Control.* Pakistan's 9th International Convention on Quality Improvement. Karachi, Pakistan.

Leonard-Barton, D., (1988). Implementation as mutual adaptation of technology and organization. *Research Policy.* No. 17, pp. 251-67.

Mehta, N., and Mehta, A., (2005). Infosys Technologies Limited. *Idea Group Inc.*

Nonaka, I., (1994). A dynamic theory of organizational knowledge creation. *Organization Science, 5(1),* 14–38.

Nonaka, I. and Takeushi, H., (1995). The Knowledge-Creating Company. *New York: Oxford University Press,* USA

O'Dell, C., Hasanali, F., Hubert, C., Lopez, K., Odem, P., & Raybourn, C., (2000). Successful KM implementation: A study of best-practice organizations. *Handbook on knowledge management* Vol. 2, pp. 411- 443. Berlin: Springer-Verlag.

Paul, R. S., (1999). Strategy and Cognition: Understanding the Role of Management Knowledge Structures, Organizational Memory and Information Overload. *Blackwell Publishers Ltd.* USA.

Rothwell, R., (1986). Innovation and re-innovation: a role for the user. *Journal of Marketing Management.* No. 2, pp. 109-23.

Russ, V., Kathleen, S., and Fernando O., (2003). Organizational Learning: New Directions. *British Journal of Management,* Vol. 13. S1-S6, British Academy of Management, UK.

Sabherwal, R., and Becerra-Fernandez, I., (2003). An Empirical Study of the Effect of Knowledge Management Processes at Individual, Group, and Organizational Levels. *Decision Sciences,* Vol. 34 No. 2, U.S.A.

Scarbrough, H., (2003). Knowledge management, HRM and the innovation process. *International Journal of Manpower.* Vol. 24 No. 5, 2003. pp. 50 1-16.

Senge, P., (1990). The leader's new work: Building learning organizations. *Sloan Management Review,* Fall, 7-23.

Starbuck, W., (1992). Learning by knowledge-intensive firms, *Journal of Management Studies,* Vol. 29 No. 6, pp. 7 13-40.

Swan, J., Newell, S. and Robertson, M., (1997). Inter-organizational networks and the diffusion of information technology. *Idea Publishing Group,* Hershey, PA.

Szulanski, G., (1996). Exploring internal stickiness: Impediments to the transfer of best practices within the firm. *Strategic Management Journal,* 17, 27–43.

Thomas, H. D., David, W. De Long, & Michael, C. B., (1997). Building Successful Knowledge Management Projects. *Ernst & Young LLP.*

Von H. E., (1988). The Sources of Innovation. *Oxford University Press, Oxford.*

William, C. B., and Pratima, B., (2007). Knowledge Management as the Basis of Sustained High Performance. *Journal of Management Studies,* 44:1

News Papers:

Maeil Business Newspaper, (February 19, 1998). Knowledge Management, Knowledge Organizations & Knowledge Workers: *A View from the Front Lines.*

Criteria for Evaluating Theses/Dissertations

Muhammad Zahid Iqbal~

Rashid Ahmad Khan~ ~

ABSTRACT

This paper aimed at exploring recent literature for preparation of a checklist comprising questions that should arise in the mind of an evaluator of a thesis/dissertation rather he/she should search answers of these questions to help him/herself give final verdict. The researchers explored, reviewed and analyzed the 12 studies published during 1998 to 2008 to find parameters to be considered by the evaluators for evaluation of theses/dissertations. Analysis revealed two broad categories of evaluation of theses/dissertations viz. holistic and chapter-/section-wise evaluation comprising three and thirteen variables respectively. Being variables of holistic evaluation of theses/dissertations, "Indeterminate Qualities" received 75% weight-age in the studies reviewed, followed by "Formal Structure and Presentation" (66.67%) and "Needs of Communities Involved" (33.33%). As regards variables of chapter-/section-wise evaluation of theses/dissertations, "Data Analysis" was found on top being emphasized in 83.33% studies, followed by "Introduction" and "Research Design" (66.67% each), "Literature Review" (50%) and "Presentation of Findings and Interpretations" and "Conclusions and Recommendations" (41.67% each).

Keywords: Thesis, Dissertation, Evaluation

INTRODUCTION

Research reports written in an academic setup are known as theses and dissertations. The words thesis and dissertation are sometimes regarded as synonym for each other, which is acceptable (Mauch & Park, 2003). Therefore many authors use these terms interchangeably too (e.g. Dunleavy, 2003). However, these are differentiated as a thesis is a written report of research carryed out at honors or master's degree level whereas a similar report written at doctoral level is called dissertation. Dissertation is distinguished from thesis based on length of document, depth of study, comprehension and more mature professional and scholarly treatment of the subject (Dunleavy, 2003; Mauch & Park, 2003). Approaches to carry out research before writing a thesis or dissertation are similar thus, here and onwards the researchers will use only the acronym T/D instead of the terms thesis/dissertation as Mauch and Park (2003) did. The objective of this study is to provide comprehensive guidelines for evaluating T/D to help evaluators maintain standards of T/D evaluation and to help students complying with these standards while carrying out research at honor's, Master's, MS, M.Phil and Ph.D levels.

The author is an Assistant Professor, Faculty of Management Sciences at COMSATS Institute of Information Technology, Islamabad. He received his Ph.D in Human Resource Development from National University of Modern Languages Islamabad. Contact: mzahid75@yahoo.com

The author is Professor and Dean of Management at National University of Modern Languages, Islamabad. He holds Ph.D degree from The Technical University of Berlin. He is an experienced researcher and consultant in management in Pakistan.

Before establishing criteria for evaluating T/D, the researchers preferred to explore answers to three significant questions i.e. what is a T/D? what are common purposes of T/D? and what are key benefits of T/D?

THESES/DISSERTATIONS – CONCEPTS, PURPOSES AND BENEFITS

T/D is a document developed chapter by chapter with the scholar gradually working towards its completion (Brause, 2002) and ultimately it appears as the final product of years of independent study and research (Lovitts, 2007). Evaluators of T/D need to be aware of models of doctoral studies, such as classical model, taught PhD model and professional model. Classical model, prevailing in British- and European-influenced university systems, focuses on T/D writing in combination with preliminary coursework. T/D in classical model is also known as "Big Book Thesis" comprising an integrated set of chapters (approximately 80,000 to 100,000 words long). Taught PhD model, prevailing in American-influenced university systems, also focuses on T/D writing in combination with extensive and demanding coursework. T/D in taught PhD model is known as "Papers Model Dissertation" based on four or five publishable quality papers (approximately 60,000 words long in aggregate). The Professional Doctorate model, rarely used so far but likely to develop in future, focuses on very extensive and demanding program of coursework undertaken through out life of PhD project i.e. four or five years and T/D based on alternative approaches such as a non-written piece of practice, the completion of a project, a number of smaller papers, or a final PhD dissertation of about 30,000 words of length (Dunleavy, 2003).

The common purposes of T/D are to train the student to be professional in the discipline; show mastery of the field; prepare for a career and get a job; and contribute to the discipline by expanding knowledge and improving practice. The other, purposes of T/D for students are to learn how to conduct independent, original, and significant research; engage in a never-ending piece of research or argument; think and write critically and coherently; emphasize evidence of scholarly work; have a research competence; contribute to knowledge; have an academic standing; and find good advisors and models. The Main, purposes of T/D for faculty members are to enhance scholarship in the sense of looking for truth; build on the existing body of knowledge; and create original works (Lovitts, 2007; Mauch & Park, 2003)

According to Brause (2002) maximum benefits of T/D are enjoyed by the student him/herself as carrying out research and then writing T/D requires exposure to ideas, which is a way of learning for the student but others may or may not show reluctance to these ideas. While further highlighting learning related benefits of T/D for students she mentions that students develop organizational and evaluation skills; increase the rigor of their thinking; become committed to lifelong learning; become more adept at participating in academic dialog; become researchers; and ultimately learn about themselves as learners and writers in the process of writing T/D (Brause, 2002).

CRITERIA FOR EVALUATING THESES/DISSERTATIONS

The first question to be answered before initialization process of evaluating T/D should be, who should evaluate T/D? Brause (2002) answer to this question was while maintaining that only one who has written T/D in his/her life should evaluate it.

Rodriguez and Toews (2005) view the evaluation of research as more important than its conduct. This argument engenders an important question that why to evaluate research (or according to scope of this paper, why to evaluate T/D). Since, in addition of opting careers at research institutes, students of social sciences have many options of selecting career paths such as working as professional, providing services, running own business and educating to the

public. Therefore, in their careers other than research, they are not likely to carry out and supervise research as an academic but as a need of their profession they will have to continue evaluating research (more specifically T/D) in an effort to keep them abreast of current practices in the discipline (Rodriguez & Toews, 2005). The other idea that justifies why evaluating T/D is presented by Lovitts (2007). According to her everyone (student, supervisor, reviewers, members of reading committee, chairs and Deans), directly or indirectly, involved in the process of evaluating T/D can be at stake if the process of evaluating is not rigor one or according to set standards.

While exploring literature Rodriguez and Toews (2005) learnt that generally teaching-learning activities related to research focus on how to carry out research rather than how to evaluate it. Though learning how to do research also helps students learn something about how to evaluate research (Rodriguez & Toews, 2005), but to balance the overall emphasis on learning how to carry out and evaluate research the researchers explored answers to the question that how T/D should be evaluated?

Carden (1998) maintains that before starting process of evaluating T/D one should clarify the context of evaluation e.g. traditional concept of evaluating research emphasizes whether objective(s) of research is(are) met. If an evaluator starts evaluating T/D without clarifying the context within which evaluation is to be done then he/she will be left only with an audit-oriented approach to evaluation (Carden, 1998). Lovitts (2007) focuses more on formative evaluation (internal) than summative (external). Brause (2002) views that faculty (internal evaluators) are likely to be intense in evaluation because they want to avoid problems with external examiners/reviewers. They look at each word carefully and assess the overall cohesive organization in the document. However, ultimate decision regarding award of doctoral degree is made on the basis of both formative and summative evaluations. As regards components of the process of evaluating T/D, there may be a combination of written and oral components or only written, which is rare. Oral component aims at evaluating the depth and breadth of the student's learning and knowledge (Brause, 2002).

Whether evaluation is formative or summative and component in practice is oral, written or combination of two, evaluators should not restrict themselves to the extent of identification of problems, errors, and shortcomings only but they should clearly guide in written evaluation reports or while feeding back the student during defense meeting that how to solve the identified problem concerning presentation, style and the content of the research report, estimate the consequences of the errors in the findings, conclusions, and recommendations and off set the shortcomings (Brause, 2002; Rodriguez & Toews, 2005).

Lovitts (2007) points out that so far no studies have been done on faculty's expectations for the different components or tasks of a T/D (e.g., introduction/problem statement, literature review, theory, methods, results/analysis, and discussion/conclusion). According to her, faculty expectations become standards to judge T/D, which further help constitute indicators of the success of research training and provide evaluation standards for T/D. These standards can make T/D evaluations more valid and reliable (Lovitts, 2007). However while setting and maintaining standards one was to keep in view the guideline of Carden (1998), who recommends a shift in purpose of evaluating T/D i.e. a shift from power to empower, so that evaluation is to serve the learning function. Thus, the researchers found following criteria for evaluation of T/D suggested in relevant literature:

1. Criteria for holistic Evaluation of T/D: This is for evaluators who want to evaluate T/D as a whole (See Tables 1 and 2).
2. Criteria for Chapter-/Section-Wise Evaluation of T/D: This is for evaluators who want to evaluate T/D in depth (See Tables 3 and 4).

Evaluators are suggested to search answers of questions given in Tables 1 and 2 while evaluating T/D.

Table 1

Criteria for Holistic Evaluation of T/D – A Framework Comprising 12 Studies (1998 to 2008)

	1 (Carden, 1998)	2 (Pepper, Webster & Jenkins, 2001)	3 (Fossey, Harvey, McDermott, & Davidson, 2002)	4 (Brause, 2002)	5 (Mauch & Park, 2003)	6 (Holbrook, Bourke, Lovat & Dally, 2004)	7 (Perry & Cavaye, 2004)	8 (Swetnam, 2004)	9 (Russell, 2005)	10 (Lovitts, 2007)	11 (Pathirage, Haigh, Amaratunga & Baldry, 2007)	12 (Carter, 2008)
Needs of Communities Involved	✓	✓			✓				✓			
Does the study fulfill needs of the communities involved?	✓											
Has the researcher provided sufficient protection to human subjects?									9			
Has the researcher violated human rights or animal care obligations?					9							
Has the researcher understood the disciplinary perspectives? Is the study relevant to the discipline?	9											
Formal structure and presentation (The administrative aspects)	9	9										
Is the material well written and clearly presented? Are there typographical errors?					9	9	9	9		9	9	9
Are calculations accurate?					9	9	9			9	9	9
Are referencing, citation and formatting styles consistent?					9					9		9
Are referencing, citation and formatting styles correct? Has the researcher defined the important terms?		9						9		9	9	
Are the sections and chapters well structured/balanced? Is the tone unbiased/impartial?		9						9		9	9	
Is there a high standard of spelling, grammar and punctuations?					9			9				
Indeterminate qualities (technical knowledge and skill of the candidate)					9 9			9		9		
	9		9	9		9	9	9		9	9	9

	1	2	3	4	5	6	7	8	9	10	11	12
Does the T/D show the intellectual grasp/Clarity of ideas of the researcher?										9		9
Does the T/D reveal the researcher's ability to use critical thinking?		9								9		
Has the researcher command over subject matter?										99		
Does the T/D uncover the application of appropriate research?										9		
Has the researcher ability to use analytic methods?										9		
Has the researcher followed the overall indicators of quality?										9		
Is there a definite coherence in the finished product?		9						9		9		9
Is the researcher's interference minimal?			9									
Does the study reveal originality?				9		99				99		
Does the study make a significant contribution to knowledge, understanding and practice?				9		99		9		99		9
Does the study reveal researcher's independent contribution to knowledge, understanding and practice?						9				99		
Is the length of document appropriate?										9		9
Is the T/D a publishable document or source of publishable material?										9		
Does the T/D contain badly written repeats?												9
Has the researcher ensured and practiced research ethics?						9						
Is there any evidence of plagiarism?						9						

Table 2

Studies Emphasized Holistic Evaluation of T/D

	Studies (N = 12)	
Variables of Holistic Evaluation	Count	%
Needs of Communities Involved	4	33.33
Formal structure and presentation (The administrative aspects)	8	66.67
Indeterminate qualities (technical knowledge and skill of the scholar)	9	75.00

Tables 1 and 2 show that among variables of holistic evaluation of T/D, "Indeterminate Qualities" is on top with emphasis found in 75% studies, followed by "Formal Structure and Presentation" (66.67%) and "Needs of Communities Involved" (33.33%). Under the rubric of indeterminate qualities, the most frequently found question for holistic evaluation of T/D is "Does the study make a significant contribution to knowledge, understanding and practice?" having 58.33% presence in the studies included in the framework, followed by "Does the study reveal originality?" (41.67%) and "Is there a definite coherence in the finished product?" (33.33%). However, each of rest of the 13 questions carries 25% or less presence in the relevant studies. Under the head of formal structure and presentation, the most frequently found question is "Is the material well written and clearly presented?" having 50% presence in the studies, followed by "Are referencing, citation and formatting styles consistent?" and "Are referencing, citation and formatting styles correct?" (33.33% each). However, each of rest of the four questions carries 25% or less presence in the relevant studies. As regards variable of needs of communities involved,

all questions carry equal presence in the relevant studies i.e. 8.33% each.

Table 3

Criteria for Chapter-/Section- Wise Evaluation of T/D – A Framework Comprising 12 Studies (1998 to 2008)

Chapter-/Section-Wise Evaluation	1 (Carden, 1998)	2 (Pepper, Webster & Jenkins, 2001)	3 (Fossey, Harvey, McDermott, & Davidson, 2002)	4 (Brause, 2002)	5 (Mauch & Park, 2003)	6 (Holbrook, Bourke, Lovat & Dally, 2004)	7 (Perry & Cavaye, 2004)	8 (Swetnam, 2004)	9 (Russell, 2005)	10 (Lovitts, 2007)	11 (Pathirage, Haigh, Amaratunga & Baldry, 2007)	12 (Carter, 2008)
Title				9	9	9				✓		
Is the title clear enough to sum up theme of the study? Is it concise?				9								
Is it interesting for readers?				9	9							
Does it reveal importance of the topic?									9			
Introduction			9									
Is the background controversial?	9	9	9	9	9	9					9	
Does it give a clear outline of the purpose, hypothesis and research question?			9									
Is there a justification of the origin and likely value of the research?							9	9				
Has the researcher made T/D's context clear?												9 9
Has the researcher set research aims and objectives clearly?												
Has the researcher clearly defined the scope of the study?												
Is the research problem clearly stated?											9	
Is the research problem significant?												
Are limitations of the study clearly stated?						9						
Literature Review	9			9				9				
Is the literature critically evaluated?				9				9				
Are gaps and inconsistencies in the literature described? Is the literature current?				9		9						
Is the review complete?				9	9	9	9	9		9		
Is the relationship of study to previous research is clearly stated?								9		9		
					9			9				
								9				
					9			9				
				9		9						

	1 2 3 4 5 6 7 8 9 10 11 12
Is the review of literature is efficiently summarized?	9 9
Does the literature thoroughly underpin the theory relating to the study?	✓ ✓ ✓
Is it wide ranging from general to the specific?	✓
Is the work of others acknowledged properly?	✓
Is the review of literature constantly related to research objectives?	✓
Theoretical/Conceptual Framework	✓
Is the theoretical/conceptual framework clearly described including concepts and relationships?	✓ ✓ ✓
Does the problem clearly link to and flow from the theoretical/conceptual framework?	✓
Does the philosophical/theoretical approach 'fit' the research issue?	✓
Does the method use 'fit' with the philosophical/theoretical approach?	✓
Is the study congruent with the stated philosophical/theoretical approach?	✓
Are there any blatant errors in logic?	✓
Is there any serious misapplication of some theory to the research problem?	9
Does the theoretical/conceptual framework provide	9
Research Design	
Is the research design clearly stated?	9
Is the research design developed and adapted to respond to real-life situations?	✓ ✓ 9 9 9 9 9 9 9
Are assumptions clearly stated?	
Are assumptions reasonable/acceptable?	✓ 9 9
Are research questions clearly stated?	9 9 9
Are research questions answerable?	9
Are research questions derived from the review of literature?	9
Are hypotheses clearly stated?	9
Are hypotheses testable?	9
Are hypotheses derived from the review of literature?	9
Have variables been operationally defined?	9
Has the researcher ensured validity of the data gathered?	9
Has the researcher explained reliability of the data gathered?	
Has the researcher used the appropriate methods to analyze data?	9
Are there obvious flaws in the research method?	9
Is there a critical review of possible methodologies?	9 9 9
Is a convincing rationale evident for the style and approach used?	9 9
Are possible techniques for data collection proposed?	9
Are population and sample outlined?	

	1	2	3	4	5	6	7	8	9	10	11	12
Has the researcher understanding of appropriate research method?												
Population and Sample			9	9	9				9			
Is population clearly described? Is the sample clearly identified?					9							
Is method of sampling appropriate/justified?					9				9			
Is the rationale for the sample size provided?								9			9	9
Is the relationship between the sample and the target population clearly described?									9			
Are the sampling strategies suitable for identification of participants?											9	9
Is a detailed description of the participants provided?												
Is sampling developed and adapted to respond to real-life situations?			9									
Procedure					9				9			
Is the procedure written clearly?									9			
Does the procedure flow logically?									9			
Are procedures described in detail?					9				9			
[illegible]?					9							
Instrumentation									9			
Is it clear which instruments will measure the specific concepts?									9			
Is the rationale for instrument selection acceptable?									9			
Is the reliability for each instrument described and acceptable?									9			
Is the validity for each instrument described and [illegible]?												9
Data Collection			9	9	9				9			
Have the processes of data gathering been rendered transparent?			9									
Do the processes of data gathering give privilege to participants' knowledge?			9									
Are data gathering methods appropriate for solution of the problem?					9							
Is data gathering developed and adapted to respond to real-life situations?			9									
Are suitable data gathering methods used to inform the research question being addressed?			9									
Is there a detailed description of the data gathering processes followed?			9		9							
Is it clear that the data are collected systematically and logically by appropriate methods?									9			
Are instruments, scales and statistics relevant and effective?									9			
[illegible]?								9				
Data Analysis		9	9			9	9	9	9	9	9	9
Is the data analysis section well organized?											9	
Is the statistical method used for analysis appropriate for the research question(s) and hypotheses?											9	

Are diagrams, tables and graphs clearly labeled? Do the diagrams, tables and graphs complement the text? 9 9 9

Are the processes of analysis rendered transparent? 9

Is there a detailed description of the analytical processes followed? 9

Are multiple methods and/or sources of information weighed in the analysis? 9

Is the issue of reliability considered? 9

Is the issue of validity considered? 9 9

Is the issue of generalizability considered? 9

Has the researcher shown ability to analyze primary and/or secondary data?

[illegible]

Presentation of Findings and Interpretations 9 ✓

Is there convincing interpretation and inference linked to the data presented? ✓ ✓ ✓ ✓ 9

Are participants' views presented in their own voices and views (verbatim)? ✓

Is a range of dissenting voices and views represented?

Are the descriptions and interpretations of data are recognizable to the experts of that field? 9 9

Are power relations in data collection and analysis taken into account? 9

Do the findings 'fit' the data from which they are derived? 9

Has the researcher discussed the proportion of the data taken into account? 9

Are interpretations of the findings written clearly?

Is the researcher's role transparent in the interpretive process? 9 9

Are the findings generalized?

Is the relevance of the findings to theory or practice explained? ✓ 9 9

Is the nature of the findings discussed in the context of the framework? ✓

Are the limitations of findings for the field discussed? ✓

Are the implications of findings for the field discussed? 9 9

Results and Discussions 9

Are the results written scholarly? 9 9 9

Are the results assessed fairly? 9

Does the discussion clearly flow from the data? 9

Are major results discussed while relating to previous research?

Is importance of the results explained? 9 9

Is the relationship between the research and the results demonstrated with logical reasoning? 9

Does the discussion place the study's findings in context [illegible]

9

	1 2 3 4 5 6 7 8 9 10 11 12											
	1	2	3	4	5	6	7	8	9	10	11	12
Conclusions and Recommendations		9			9		9	9	9			
Are conclusions reasonable?							9			9		
Are justifications offered for the author's conclusions?							9		9			
Are conclusions clearly stated?					9		9					
Do the conclusions follow logically from the data presented?		9			9		9	9				
Do the conclusions maintain a clear link with the initially stated research objectives?								9				
Are the recommendations convincing?								9	9			
Are the recommendations practical?								9				
Are implications for practice delineated?					9				9			
Are implications for future research delineated?					9				9			

Table 4
Studies Emphasized Chapter-/Section-Wise Evaluation of T/D

	Studies (N = 12)	
Variables of Chapter/Section-Wise Evaluation	Count	%
Title	4	33.33
Introduction	8	66.67
Literature Review	6	50.00
Theoretical/Conceptual Framework	3	25.00
Research Design	8	66.67
Population and Sample	3	25.00
Procedure	2	16.67
Instrumentation	1	8.33
Data Collection	4	33.33
Data Analysis	10	83.33
Presentation of Findings and Interpretations	5	41.67
Results and Discussions	3	25.00
Conclusions and Recommendations	5	41.67

Tables 3 and 4 reveal that among variables of chapter-/section-wise evaluation of T/D, "Data Analysis" is on top with emphasis found in 83.33% studies, followed by "Introduction" and "Research Design" (66.67% each), "Literature Review" (50%) and "Presentation of Findings and Interpretations" and "Conclusions and Recommendations" (41.67% each). As regards chapter-/section-wise evaluation of T/D, following are the questions having maximum percentage of being discussed in the studies included in the framework among questions of respective chapter/section:

1. Title – All questions carry equal percentage i.e. 8.33% each
2. Introduction – "Is the research problem clearly stated?" (25%)
3. Literature Review – "Does the literature thoroughly underpin the theory relating to the study?" (25%)
4. Theoretical/Conceptual Framework – All questions carry equal percentage i.e. 8.33% each
5. Research Design – "Are research questions clearly stated?" (25%)
6. Population and Sample – "Is the sample clearly identified?" and "Is method of sampling appropriate/justified?" (16.67% each)
7. Procedure – "Are procedures described in detail?" (16.67%)

8. Instrumentation – All questions carry equal percentage i.e. 8.33% each
9. Data Collection – "Is there a detailed description of the data gathering processes followed?" (16.67%)
10. Data Analysis – "Are diagrams, tables and graphs clearly labeled?" (25%)
11. Presentation of Findings and Interpretations – "Are the findings generalized?" (16.67%)
12. Results and Discussions – All questions carry equal percentage i.e. 8.33% each
13. Conclusions and Recommendations – "Do the conclusions follow logically from the data presented?" (33.33%)

CONCLUSIONS

The outcome of this piece of writing is a set of two checklists for evaluating T/D. First for holistic evaluation of T/D, which contains a set of 30 questions further divided into three variables viz. Needs of Communities Involved (5 questions), Formal structure and presentation (9) and Indeterminate qualities (16). Second checklist for chapter-/section-wise evaluation of T/D comprises 121 questions further divided into 13 variables (chapters/sections) such as Title (5 questions), Introduction (10), Literature Review (11), Theoretical/Conceptual Framework (8), Research Design (20), Population and Sample (8), Procedure (4), Instrumentation (4), Data Collection (9), Data Analysis (12), Presentation of Findings and Interpretations (14), Results and Discussions (7), and Conclusions and Recommendations (9).

As suggested by Swetnam (2004), it can help set standards of T/D evaluation if evaluators establish quality scales based on above checklists as 5 = Excellent, 4 = Very Good, 3 = Good, 2 = Acceptable and 1 = Unacceptable. Moreover, before communicating the final verdict evaluators may calculate overall score and in case of finding items being scored as "unacceptable" they may include suggested solutions in the evaluation report.

FUTURE RESEARCH

The researchers wish to develop a quality scale based on criteria for holistic and chapter-/section-wise evaluation of T/D by carrying out an empirical analysis. The researchers are interested to carry out this research for the field of management science, which they belong to. However, if researchers from other fields could carry out the empirical research on the same lines for their respective disciplines/subjects, it will surely help universities of Pakistan set standards for evaluating T/D, which will ultimately lead to quality research in both respects i.e. its conduct and evaluation.

REFERENCES

Brause, R. S. (2002). *Writing your doctoral dissertation: Invisible rules for success.* London, UK: Routledge.

Carden, F. (1998, Winter). Research evaluation: From power to empowerment. *Knowledge & Policy, 10(4),* 67-76. Retrieved July 16, 2008, from Academic Search Premier database, http://search.epnet.com

Carter, S. (2008, November). Examining the doctoral thesis: A discussion. *Innovations in Education & Teaching International, 45(4),* 365-374. Retrieved November 5, 2008, from Academic Search Premier database, http://search.epnet.com

Dunleavy, P. (2003). *Authoring a PhD: How to plan, draft, write and finish a doctoral thesis or dissertation.* London, UK: Palgrave McMillan.

Fossey, E., Harvey, C., McDermott, F., & Davidson, L. (2002, December). Understanding and evaluating qualitative research*. *Australian & New Zealand Journal of Psychiatry, 36(6),* 7 17-732. Retrieved July 16, 2008, from Academic Search Premier database, http://search.epnet.com

Holbrook, A., Bourke, S., Lovat, T., & Dally, K. (2004). Qualities and characteristics in the written reports of doctoral thesis examiners. *Australian Journal of Educational & Developmental Psychology, 4,* 126–145. Retrieved November 06, 2008, from http://www-cms.newcastle.edu.au/group/ajedp/Archive/Volume_4/v4-holbrook-et- al.pdf

Lovitts, B. E. (2007). *Making the implicit explicit: Creating performance expectations for the dissertation.* Virginia, USA: Stylus.

Mauch, J. E. & Park, N. (2003). *Guide to the successful thesis and dissertation: A handbook for students and faculty* (5th ed.). New York, USA: P Marcel Dekker.

Pathirage, C., Haigh, R., Amaratunga, D., & Baldry, D. (2007). Enhancing the quality and consistency of undergraduate dissertation assessment: A case study. *Quality Assurance in Education, 15(3),* 27 1-286. Retrieved November 04, 2008, from Emerald database, http://www.emeraldinsight.com

Pepper, D., Webster, F., & Jenkins, A. (2001, March). Benchmarking in Geography: Some implications for assessing dissertations in the undergraduate curriculum. *Journal of Geography in Higher Education, 25(1),* 23-35. Retrieved November 5, 2008, from Academic Search Premier database, http://search.epnet.com

Perry, C., & Cavaye, A. (2004). Australian universities' examination criteria for DBA dissertations. *International Journal of Organizational Behavior, 7(5),* 411–421. Retrieved November 06, 2008, from http ://www.usq.edu.au/extrafiles/business/journals/HRMJournal/International Articles/ Volume%207/PerryCavaye.pdf

Rodriguez, A. & Toews, M. L. (2005, Summer). Training students to be better consumers of research: Evaluating empirical research reports. *College Training, 53(3),* 99-101. Retrieved July 16, 2008, from Academic Search Premier database, http://search.epnet.com

Russell, C. (2005, January). Evaluating quantitative research reports. *Nephrology Nursing Journal, 32(1),* 61-64. Retrieved July 16, 2008, from Academic Search Premier database, http://search.epnet.com

Swetnam, D. (2004). *Writing your dissertation: How to plan, prepare and present successful work* (3rd ed.). Oxford, UK: How to books.

A Survey on Real Time Software Fault Tolerance in Distributed Environment

Muhammad Sanaullah, Faria Arshad

ABSTRACT

A real time application is one which not only contains the logical correctness of the application but also contains the limitation of time factor. This time factor is usually given at the time of requirement collection phase, and is considered as constraint on the system. Real time applications are of hard real time and soft real time applications. Head real time applications are very critical, where a little delay in the time may give enormous losses. The distributed environment is one where diferent computers known as nodes are attached with each other using diferent communication channels. The distributed system contains a lot of failures due to diferent reasons even their causes are also not known to the system itself. For achieving the completion of task within the time, or for the conformance of results we divide the task or send replica copy of the desired task on diferent nodes. As the distributed systems are unreliable and there is also a chance for the process to be faulty. We required Fault-Tolerance due to the criticality of task. This paper is a survey paper and it contains all the techniques that are used for the real time software fault tolerance in the distributed environment. To analyse these technique, we identify a set of strong parameters and construct an analysis matrix on the basis of these parameters. By viewing this matrix we conclude that most techniques are not using the priority level support. We also see that the asynchronous method of communication is best for the fault tolerance at node level in the real time distributed environment.

KEYWORDS:
Fault Tolerance, Real-Time System, Distributed System

Introduction and Background

The concept of real time application is not only the logical correctness checking of the application but also checking the limitation of time factor. This time factor is usually given at the time of requirement collection phase by the company/ organization that is willing for the designing of the software, This time factor is considered as constraint on the system (wikipedia.org/wiki/Real_time). The design application must meet this time condition as well. Real time applications are of hard real time and soft real time applications. Hard real time applications are very critical, where a little delay in the time may give enormous losses (e.g. car engine, medical systems such as heart pacemakers). A very good example of Hard Real Time application is Missile firing application. If an error occurs in the process of calculating the target, then a fault tolerance algorithm must detect and recover the fault with in

defined fault detection calculation time. If the task is not completed with in a given time then missile hits the wrong place rather than the targeted place. The soft real time applications are not so much critical and therefore can tolerate such little delays (e.g., dropping frames while displaying a video) . The distributed environment is one where different computers known as nodes are attached with each other using different communication channels (wikipedia.org/wiki/Distributed_computing). The distributed system contains a lot of failures due to different reasons even not known to the system itself. These failures may occur due to the hardware faults or the software faults. For achieving the completion of task within the time, or for the conformance of results we divide the task or send replica copy of the desired task on different nodes. These nodes may perform same type of calculations or different type of calculations; this method is considered as a Distributed Computation (wikipedia.org/wiki/Distributed_computing). The tasks that are performed among different nodes may be segmented computed or parallel computed. World Wide Web is an example of distributed computing.

As the distributed systems are unreliable and there is also a chance for the process to be faulty, a Fault-Tolerance mechanism is applied on this type of critical task. Here we consider only the software faults tolerance mechanism for real time distribution environment. The functionality of the software fault tolerance processes is divided into three main steps. In the first step it detects the faults and in the second step it finds the most suitable alternative for recovering these faults and in the third step it implements this selected process (Liu *et al*, 2006).

Faults that occur in distributed environment are usually of two types, transient and permanent faults. Transient faults are those faults that occur at a specific time and remain in the system for a limited time interval; where as Permanent faults are those faults that occur in a system at a specific time during the execution of the program. These types of faults remain in the system until the faulty component will be repaired or replaced. It is preferable to mask the fault at the node level. During the masking of faults at node level two types of node behaviors occur, Fail-Silent and Omission Failure. In Fail-Silent behavior node performs three types of actions. Node may produce correct output, or in the case of finding error it may produce no output or it generates an error message that can be understandable for the other node or the entire system. In Omission Failure node behavior no result will be produced in case of detecting error.

For masking of faults different techniques are used which may be roll-forward recovery or roll-backward recovery (wikipedia.org/wiki/Fault-tolerant_system). The main objective of fault tolerance is that if one component is running and its sub-process become faulty then to avoid the whole system becoming faulty we use fault tolerance technique for the recovery the faults (wikipedia.org/wiki/Fault_tolerant). In this process the first attempt is to recover the fault and when it is not possible then make the node in the Omission failure state so that wrong results don't lead to wrong direction.

Different types of techniques are used in the fault tolerance process. In this survey the techniques related to the software real time fault tolerance in distributed system are examined. After identifying a set of strong parameters an analysis of these approaches is presented in the form of analysis matrix.
The following sections deal with explanation of the techniques; defense parameters; analysis of the technique and conclusion of the survey.

TECHNIQUES

A framework for Node-Level Fault Tolerance in Distributed Real Time System

Aidemark *et al* presented a framework for the Node Level Fault Tolerance (NLFT) in the real time distributed environment. The basic objective of this framework is to camouflage the faults at node-level. If faults are masked at node level then the performance of the overall process will increase and system will be more reliable, the probability of node failure will be reduced and the system dependability will be increased.

Two types of approaches are used to overcome node-level faults. First approach uses 2f+1 node in the case of f node failures. The second approach is fail-silent node. The basic purpose of using the fail-silent node is to reduce the number of nodes. If there are f node failures then this approaches required f+1 node.

The approach is known as Light-Weight NLFT for tolerating the faults at node level. Its only handle the transient faults at the node level. Two types of guards are used for providing the node level fault detection. First guard masks the transient faults, which are local to the node. Second guard shows errors or it shows the permanent fault failure and makes the node as fail-silent node. Temporal Error Masking (TEM) is used in Light-Weight NLFT. The objective TEM is to tolerate transient faults.

TEM is used to support the transparent error handling in Real Time System. In real time each task has some priority. Different approaches used different priority level on different bases. Some assign priority on the basis of run-time. But the priority is assigned on the basis of criticality of job. The criticality of job is increased on the basis of failure of job. The more the chances of failure the higher is the priority level.

A Fault-Tolerance Layer for Distributed Fault-Tolerant Hard Real-Time Systems

Tanzer and Poledna introduced Fault Tolerance Layer architecture in which a new Fault Tolerance FT Layer is added in the system. The purpose of this layer is to increase error detection capabilities, fault tolerance mechanisms based an active replication, and the interface between application software running on different nodes on the distributed environment and the communication channel.

FT Layer Model is based on DFR Meta Object Model. This DFR model is based upon the separation of three domains: value domain, time domain and distribution domain. As DFR model is design to get compos ability, reuse ability, test ability, and maintain ability and also give the grantee of efficiency, guaranteed response time, robustness and fault tolerance. Due to these FT Layer is based upon DFA model to meet the specific requirement of distributed fault-tolerant hard real-time system.

The error detection and fault tolerance mechanism of FT layer is achieved by making the assumption that the node is fail-silence. To achieve this it is important to define hypothesis for each node according to the circumstances of the environment like hypothesis about the control flow faults, control timing faults, data flow faults, data calculation faults, data storage faults etc.

Adaptive software fault tolerance policies with dynamic real-time guarantees

Nett *et al* (1996) describes the technique basing on the techniques of Bondavalli *et al*(1995), Gergeleit *et al*(1994). The Fault-Tolerance Entry for Real Time (FERT) notations was introduced including Task-Pair Scheduling (TPS). Nett *et al* (1996) combines these techniques with the condition of knowing the Worst Case

Execution Time (WCET) and provides a flexible implementation of these techniques in the runtime system. Because, these notations are powerful and although to some extent expensive but they also give maximum freedom to designer and are more common in used by designers.

This structure of FERT notation divided into three main parts Interface, Control and Application Module. Interface part is a combination of input and output ports. Control part controls the executions of Application Models. Application Module consists of alternative Applications Models with there worst case execution time.

Task-Pair Scheduling Scheme is designed to dynamically generate each component of the application according to its execution, and to reduce the computation to the minimum level, and also to execute the remaining part of application on the basis of best effort approach. By Best effort means that we must explicitly want to consider the unknown time behavior of Soft task.

Feedback based real-time fault tolerance - issues and possible solutions

By impressing with the strategy of feed back that is used for the improvement in any industry or in every place like in software industry, private or public sectors. A feed back is produced from the users and upon the basis of this a new strategy is adopted and implemented.

As Liu *et al* (2006) describes the architecture of feed back based real time fault-tolerance in distributed environment and the name given to this architecture is ORTGA (On-demand Real-Time GuArd) Feed back strategy consists of three parts. In the first part identification of fault action is performed, in the second part find the best suitable alternative to overcome these faults is performed and in the third part the implementation of the alternative action is performed.

In ORTGA architecture the software component of plan is divided into two sub components according to there capabilities of work. These subsystems are High Assurance Control (HAC) and High Performance Control (HPC) subsystems.

At every decision time, decision module gets the state feedback from the plant. Than it decide whether it is the correct state. The state that is established by the HAC plan. If it is then HPC still controls the plant. Otherwise the control is transfer to the HAC. Decision module determines the correct output value of the plant, that which output is used by which plant. Than the plant will execute the control output value, according to the out put value. The faults are divided in to the logical domain, and the execution domain. To check a method/process a heartbeat message method is used to check the execution faults in the real time applications same as used by Ayav *et al* (2006).

Replication Control for Fault Tolerance in Distributed Real-Time Database Systems

Replication technique is mostly used in the development of real time applications in distributed environment. Especially for the critical system. The replication system does not require more time for the detection and recovery of faults (Smith and Moser,2004). The replica is considered as a process. If one of the replicas get fault, its do not need to detect fault and recover the fault. Upon the basis of majority voting the correct result is detected.

Sang *et al* (1998) presented a replication control algorithm. Which works with real time scheduling and replication control for the tolerance of desired level of faults. The algorithm suggested work on the basis of majority consensus and it also introduced the epsilon-serialization which is less strict as compared to the one-copy serialization. Epsilon-serializability (ESR) is used to maintain the possibility of mutual consistency of replicated data asynchronously.

Implementing fault-tolerance in real-time systems by automatic program transformations

Ayav *et al*(2006) presents a formal approach of for representing fault tolerance in real time system by using the Program Transformations approach. A special type processor was introduced that is free from doing tasks and functions as a monitoring task, when a fault occurs the state of the system is check pointed as the roll back process is performed. It is also assumed that all tasks are independent from each other. This approach also uses message heart beating for checking the faulty process. Error recovery process is done by using check pointing or rollback recovery. The check pointing technique can be synchronous or asynchronous.

PARAMETERS

In this section the parameters and the values that are used by these parameters are presented.

Task Type

This parameter represents the type being handled by the technique. The task is considered on the basis of its nature of the system, being critical and non-critical. The task affiliated with the Critical system is known Hard real time task “HT” and the task which is less critical is known as Soft real time task “ST”. It is also possible that the technique supports both types of task for this “Both” value will be used in the analysis table.

Fault type

This parameter represents the type of faults handled by the technique. Transient faults ‘TF’ or Permanent Faults ‘PF’ as described in section 1.

Communication Way:

This parameter represents the type of communication to be performed for the detection of faults. Synchronized ‘Syn’ or Asynchronized ‘Asyn’.

Priority Level Support:

In real time distributed system fault may occur on different node, and each process has its own worth, and the problem has to solved according to its worth. This parameter represents the technique support for the priority level. ‘Yes’ represents the technique support and ‘No’ represents the technique does not support priority level.

Node level fault tolerance

In the distributed environment each node performs its task. This parameter represents whether this technique supports node level fault tolerance or not. Node level faults tolerance is more active and powerful than centralized level fault tolerance. ‘Yes’ represents the technique support, and ‘No’ represents that the technique does not support the fault tolerance at the node level.

Silence-Omission Failure:

Fail-Silence 'FS' means the technique support the failure of hypothesis on the single node. Omission Failure 'OF' represents that the technique supports the failure of communication services hypothesis. Or technique supports both.

Example Given:

This parameter represent whether example is given for the detailed description of the technique. The values used for this are 'Yes' or 'No'.

Systematic Support:

This parameter is used whether the technique uses the support of error detection and masking the errors from independence of knowing the program. The concepts used for the detection and masking the faults are Application Specific and Systematic (Application Independent). This parameter handles whether the technique supports Systematic (Application Independent or not). The values used are "Yes" for handling and "No" for not handling.

Data Integrity Checks:

This parameter is used to ascertain whether the technique supports the data integrity check (State Information, Input data, output data) or not. The values used are "Yes" for handling and "No" for not handling.

Recovery Process:

This parameter is used to show the process used for the recovery of the faults. Just as Roll back recovery, check pointing recovery or any other. The values of this parameter will indicate the process that is handled by the technique.

Fault Detection Process:

This parameter is used to show the process adopted by the technique for the detection of faults. Just like pull/push method and processor having the task for monitoring the execution of the task on different systems.

Performance Calculated:

This parameter is used to ascertain the technique representing any type of performance calculation/ comparison with other technique. This parameter represents authentication of the technique. The value of this parameter is "Yes" or "No"

COMPARISON

This section consists of the analysis of the techniques upon the basis of the above parameters and the analysis matrix of these techniques.

Analysis of techniques

In this section the analysis of the techniques that are represented in section 2 is given according to the parameters that are describe in the section 3.

Analysis of technique by Aidemark (2005)

This technique is designed for the hard real time system and masks the errors at node level. It masks Transient faults and to do that it uses two types of guards. The masking process is application independent. Data integrity is checked by using End-

to-End error detection technique. Author introduces Temporal Error Masking (TEM) process in which the task is run twice on temporal basis and results are compared if results are not same then other task is executed. On the basis of majority voting correct result will be obtained. It runs the task on the basis of time. Priority is also considered on the basis of Criticality of task. At the end comparison of the suggested approach is given with the existing one and results are explained with the help of graphs to represent how this technique is better than others.

Analysis of technique Tanzer and Poledna

This technique is designed for the hard real time system. Author introduces a new layer for the detection and masking of faults. The technique is designed for the application independent fault tolerance purpose. Replicas handling is also used. It handles the fail-silent and also Omission failure behaviors of nodes. DFR model is used for the fault tolerance purpose. Node level fault tolerance is provided. For the detection of faults different techniques like double Execution, Double Execution with reference etc are used. For the recovery process first it is checked if it is a Transient fault or Permanent fault. For transient fault re-synchronizing are re-integrating the node is used. For permanent faults the node leaves the cluster. Data integrating checks are also considered.

Analysis of technique Nett *et al* (1996)

This technique works with Worst case execution time, and it is not for a complex system Priority level is considered in this technique. This technique works on softtask and hardtask terms. The softtask with lower priority will be executed first and in the case of hardtesk, higher priority task will be executed. It works on both transient faults and Permanent faults. This technique is application dependent. Recovery block and N-Version programming is used for the purpose of fault tolerance.

Analysis of technique by Ding *et al (2006)*

This technique is based on the feedback based fault-tolerance. It handles both software and hardware faults. So it provides support for the Transient and Permanent faults. Priority and node level fault tolerance is not discussed in this technique. Heartbeat messages are used for detection of faults. Recovery oriented computation (ROC) is used for the recovery purpose.

Analysis of technique by Sang *et al* (1998)

In this paper author uses replication control algorithm which works with real time task scheduling and replication control system to achieve the desired level of fault tolerance. Real time task scheduling is used for checking the completion of task (e.g. hard real time task, soft real time task) within the given time limit. Epsilonserializability is used for the correctness process and for the detection of fault, the transaction manager is used. It does not require an application specific knowledge. Data integrity is also supported in this approach.

Analysis of technique by Ayav *et al* (2006)

This is a formal approach and it is used for real time system. It provides fault tolerance for hard real time systems. It uses heartbeat message for the detection of faults. For masking the faults it uses check pointing and rollback recovery approaches. Data integration is provided by using stable memory. In this approach asynchronous

check pointing is used. No priority level is considered under this approach. It considers File-silent processors for hard real time fault tolerance.

Analysis Matrix

In this section the analysis of the above described technique is given in the form of matrix, which is represented by table 1.

Table 1: Analysis Matrix.

Techniques Parameters	[5]	[6]	[7]	[8]	[9]	[10]
Task Type (Hard/Soft)	HT	HT	ST, HT	HT, ST	HT,ST	HT
Fault type (Permanent/transient)	TF	TF, PF	TF, PF (on the basis of time limit)	TF, PF	TF, PF	TF, PF
Communication Way	Syn	Syn	Syn	Syn	Asyn	Asyn
Priority Level Support	Yes	No	Yes	No	Yes	No
Node level fault tolerance	Yes	Yes	Yes	No	Yes	Yes
Silence-Omission Failure	FS, OF	FS	FS	FS	FS	FS
Example Given	Yes	Yes	Yes	Yes	Yes	No
Systematic Support	Yes	Yes	No	No	Yes	Yes
Data Integrity Checks	Yes	Yes	Yes	No	Yes	Yes
Recovery Process	TEM (Majority Voting)	For PF(Leave the node) and for TF (re-synchronize and re-integrate the node)	Recover Block, N Version Programming	ROC	Epsilon-serializability	Check Pointing, Rollback
Fault Detection Process	TEM	Double Execution DE, and also DE with reference	Task-Pair Scheduling Scheme (TPS)	Heartbeat messaging	Transaction Manager	Heartbeat messaging
Performance Calculated	Yes	Yes (Author Claim but comparison is not given)	No	No	Yes	No

CONCLUSION:

Real time applications are very important and should be considered, specially for the applications that are for hard real time systems. In the case of distributed environment where the rate of uncertainty is very high, and applications are critical; fault tolerance mechanism is very important. This paper has surveyed all the techniques that are used for the real time fault tolerance in the distributed environment.

We defined a set of strong parameters which are very important for the measurement of the accuracy, adequate and completeness of the technique. We analysed these techniques on these parameters and conclude that a technique proposed by Tolga Ayav et al. under the name "Implementing fault-tolerance in real-time systems by automatic program transformations" fulfills nearly all parameters but the main drawback of this technique is that it does not support the priority level. For authentication of the technique no example and comparison is given. There is a need to design a technique which fulfills all the parameters that are given above.

REFERENCES:

Wikipedia, Real-time computing, retrieved from http://en.wikipedia.org/wiki/Real_time, on 01-11-2007

Wikipedia, Distributed computing, retrieved from http://en.wikipedia.org/wiki/Distributed_computing, on 01-11-2007

Wikipedia, Fault-tolerant system, retrieved from http://en.wikipedia.org/wiki/Fault-tolerant_system, on 01-11-2007

Wikipedia, Fault-tolerant design, retrieved from http://en.wikipedia.org/wiki/Fault_tolerant, on 01-11-2007

Aidemark, J.; Folkesson, P.; Karlsson, J.: "A framework for Node-Level Fault Tolerance in Distributed Real Time System", Proceeding of the International Conference on Dependable Systems and Networks 2005, (DSN 2005), Volume , Issue , 28 June-1 July 2005 Page(s): 656 – 665 Digital Object Identifier 10.1 109/DSN.2005.7

C. Tanzer, S. Poledna, "A Fault-Tolerance Layer for Distributed Fault-Tolerant Hard Real-Time Systems", Regular Report of TTTech Computertechnik GmbH Schönbrunner Straÿe 7, A_1040 Vienna, Austria

E. Nett, H. Streich, P. Bizzarri, A. Bondavalli, F. Tarini, "Adaptive software fault tolerance policies with dynamic real-time guarantees", Proceedings of the 2nd Workshop on Object-Oriented Real-Time Dependable Systems (WORDS '96), PP 78, IEEE Computer Society Washington, DC, USA, ISBN:0-8186-7570-5.

Liu, X., H. Ding, K. Lee, L. Sha, and M. Caccamo "Feedback based real-time fault tolerance - issues and possible solutions." First International Workshop on Feedback Control Implementation and Design in Computing Systems and Networks, FEBID'06.

Son. H. Sang, Zhang. Fengjie, kang. Ji-Hoon; "Replication Control for Fault Tolerance in Distributed Real-Time Database Systems" IEEE 1998, ISBN: 0-7803-4311-5.

Tolga Ayav, Pascal Fradet, Alain Girault, "Implementing fault-tolerance in real-time systems by automatic program transformations", Proceedings of the 6th ACM

& IEEE International conference on Embedded software, 2006, PP: 205 – 214, ACM Press New York, NY, USA, ISBN:1-59593-542-8

A. Bondavalli, J. Stankovic and L. Strigini : “Adaptable Fault Tolerance for Real-Time System” in “Responsive Computer-Systems: Towards Integration of Fault-tolerance and Real-Time” D. Fussell, Ed.. Kluwer Academic Publishers, 1995, PP 187-208

M. Gergeleit, J. Kaiser, H. Streich: “Towards a Distributed Object-Oriented Real Time Control System”, Workshop on Concurrent Object-based System, in Conjunction with the IEEE Symp, on Parallel and Distr, Processing, Dallas, TX, October 1994.

Melliar-Smith, P.M. Moser, L.E., “Progress in real-time fault tolerance”, Proceedings of the 23rd IEEE International Symposium on Reliable Distributed Systems, 2004. PP: 109- 111, Held 18-20 Oct. 2004, ISBN: 0-7695-2239-4

Technological Change Based Human Resource Development Practices in Pakistan

Gulfam K. Khalid, Arooj Malik, Syeeda Noreen Khan

ABSTRACT

This study has investigated the impact of use of technology on HRD practices and given comparison of these practices in large enterprises and small and medium enterprises in Pakistan. The study has examined role of technology on human resource development practices and its influence on private sector. It also compared the frequency of practices used by diferent organizations against technological changes. This research was carried out in Islamabad and Rawalpindi by applying field survey methodology for which a questionnaire was designed. Findings showed that mostly HRD practices were the similar among diferent organizations; however, there were also some diferences. On-the-job training was reported the most reliable tool for the HRD in private sector. Overseas training and Games and simulation were least practiced developmental methodologies. Stress management training was most frequently used strategy in HRD practices to cope with technological change.

INTRODUCTION

The foundation of this research work is the *comparison* of human resource development (HRD) practices in not only the large enterprises but also the small and medium enterprises (SME). These two sectors are different on various dimensions such as size of the organization, nature of business, total productive assets, revenue earned, availability of opportunity and exposure to technology.

According to definition of SMEDA (Small and Medium Enterprises Authority) an SME entity is defined as a business with an investment in productive assets (not including land and building) ranging between Rs. 2-40 million and employing between 10-99 workers. As per State Bank of Pakistan (SME Prudential Regulations) SME is an entity, ideally not being a public limited company, which does not employee more than 250 persons (manufacturing) and 50 persons (trade / services) and also fulfills one of the following criteria:

(i) A trade / services concern with total assets at cost excluding land and buildings up to Rs. 50 million.

(ii) A manufacturing concern with total assets at cost excluding land and building up to Rs. 100 million.

(iii) Any concern (trade, services or manufacturing) with net sales not exceeding Rs. 300 million as per latest financial statements. In this paper the researchers follow the definition of SME as per State Bank of Pakistan (SME Prudential Regulations) and consider all other private companies as large enterprises including public limited companies, private limited companies, national, multinational, international and transnational organizations.

There are many factors on the basis of which the differentiation can be made between large enterprises and SME; one of them is the human resource management (HRM). The main components of HRM are recruitment and selection, performance evaluation, training and development and compensation. These factors are different in two sectors (large enterprises and SME) and training and development encompasses HRD practices. Training is generally accepted as an important component and is the prime responsibility of management as a whole (Ogden, 1961).

For organizations, irrespective of their size, nature and industry, HRD is essential to ensure better output from the human resources by increasing their efficiency, interest, motivation and creativity. HRD is important to provide opportunities to the human resources to hold different positions to reduce turnover of high potential human resources, to provide adequate supply of qualified human resources for future openings in technical, managerial and other key positions or to develop different kinds of knowledge, skills and attitude of the human resource to perform their duties effectively and efficiently (Choudhuri, 1995).

All production resources like land, entrepreneurship and capital can be achieved with little effort. However skilled labor (developed human resource), have an indispensable role to play a winning part. Retention with organization is really a challenge due to its scarcity in South East Asia and specifically in Pakistan. One of the best ways to penetrate the market is to make unskilled labor force *developed human resource*. Many researchers were able to show an association between technological changes and human resource development practices in the West but very little effort is being made in this context particularly in Pakistan.

RATIONALE OF THE STUDY

Work has been done on HRD practices and articles have been written but no significant empirical study has been conducted in Pakistan. This establishes the basis for doing this quantitative survey. The purpose of this study is to analyze the disparity of HRD practices between large enterprises and SME, to identify the culture of trainings and to see which developmental methodologies and strategies are being practiced in these two sectors. The present economic pressures have resulted in increasing resource scarcities, competitiveness, rapid and complex technological changes on the one hand, and the social transformation of the work force on the other, demand the efficient use of the resource inputs in the production process (Durrani, 1987).

On the basis of this study, business people can analyze and develop strategies for the benefit of the business community. The analysis in this research work can be useful to business people in expanding their vision.

LITERATURE REVIEW

The most prominent resource in Pakistan is the human resource. Managing this resource requires organization and alterations in the value systems of the potential and actual productive work force (Bernstein, 1983). Based on sound economic logic, the optimum utilization and development of the human resources to meet the challenges of the environment may be the most important criterion for the organizational survival (Durrani, 1987).

HRD is concerned with training, development and education; it has been defined as an organized learning experience, conducted in a definite time period to

increase the possibility of improving job performance and growth (Gene, 2003). Training is the acquisition of technology, which permits employees to perform their present jobs up to predetermined standards. It improves human performance on the job the employee is presently doing or is being hired to do. Also it is given when new technology is introduced into the workplace. Training is defined as learning that is provided in order to improve performance on the present job. A person‘s performance is improved by showing him/her how to master a new or established technology. Development is training people to acquire new horizons, technologies, or viewpoints (Gene, 2003). Development is an activity, which makes an employee better, fuller and a more useful contributor to the achievement of large enterprises goals. Thus, development is concerned with making an individual more effective in achieving present and future goals of the organization (Durrani, 1987). The term ‘development’ is also considered to carry with it the notion of improvement (Qureshi, 1984). Training and development are the two most inter-related concepts, which contribute to efficient utilization of the manpower resources of the organization (Siddiqi, 1984).

Employee development can play a vital role in the success of any organization as the concern for employee development reflects the underlying philosophy of the organizational leaders that the untapped contributions of human resources in the organization could make the difference between efficiency and inefficiency, death and survival in the competitive environment. Organizational top management has realized that an effective and efficient organization does not evolve by chance but is shaped by the way the leaders respond to the changing environment and utilize their resources optimally (Durrani, 1987). Employee development plans take care of future and present manpower requirements, performance appraisal, and establishment of employee training and development programs and evaluation of such schemes. Employee development programs are often necessitated in case an organization is involved in technological changes, which often means an almost constant redistribution of talents from obsolescent skills to newer ones (Jafri, 1976).

Multidimensional changes in technology, activities, specialization and social values have increased the importance of career planning and career development of human resources of organizations in present days (Choudhuri, 1995). Employee development programs are further necessitated in case an organization is involved in technological changes, which often means an almost constant redistribution of talents from obsolescent skills to newer ones (Jafri, 1976). Companies have begun to redefine the function of human resource development (HRD), and to rethink their expectations of it (Bates *et al,* 2002; Clarke, 2004; Mulcahy & James, 2000; Thurow, 1996). Developing human resources for the technical workforce: a comparative study of Korea and Thailand by Joshua D. Hawley and Jeeyon Paek shows that Asian countries face significant and growing shortages of technically skilled workers (APEC, 2004).

Technology can be classified into three types: (1) product, (2) process, and (3) management (Osman-Gani, 1996). Briefly, product technologies are those in which ideas are enlarged into a concrete object. Process technologies are the sequential steps used to produce a product or deliver a service. Management technologies are the actions taken to optimize resources to achieve business goals (Osman-Gani, 1991). Technology simply refers to the processes by which an organization turns inputs into outputs, more specifically, however, technology represents the tools, machines and control devices use to carry out tasks and principles, techniques and reasoning which accompany them. It also refers to the applications of knowledge and skills for the achievement of practical purposes. It can be said that technological change refers to

the rapid change and development in technology that has a potential, like the knowledge explosion, to quickly counter product / services obsolescence. Technological change is a constant phenomenon in contemporary organizations. How to prepare employees for technological change has increasingly become an issue for human resource development theory and practice (Osman-Gani, 2005). Business and Industry in modern times is undergoing rapid changes due to revolution brought by advancement in science and technology (Siddiqi, 1984).

METHODOLOGY

Research objectives

The objective of this study is to identify human resource development practices used by different organizations both in large enterprises and in SME to tackle the rapid technological changes in a broad sense; while more specifically following are the objectives of this study;

1) What is the extent and level of human resource development practices of private sector in Pakistan?
2) What are the issues in training and development by private sector?
3) What is the nature of differences among companies from both large enterprises and SME sector in using human resource development strategies to cope with technological change?

Sample and Methodology

Sample consisted of 350 respondents out of which only 218 respondents (134 from 54 large enterprises and 84 from 84 SME) responded from different sectors of economy in Rawalpindi and Islamabad. Overall response rate was approximately 62.30%. Response rate of small and medium business (SMB) was comparatively very low. Only entrepreneurs were selected as target respondents in SME. Only those SME were selected where technology is implemented in some form. More than 75% SME selected were from IT industry, consulting firms and manufacturing firms. Not more than four employees were surveyed in each large enterprise. Only middle level managers were studied including human resource managers. Non probability convenience sampling technique was used due to time constraints.

The questions were carefully worded to avoid misinterpretation. Technical terms were also explained in simple language. Questionnaire had two parts; the first part consisted of questions which aimed to identify training and development schedules, level of the management normally trained, conduction and evaluation of training whereas the second part consisted of questions about developmental methodology and strategies organizations adopt for employee development. Five level Likert scale was used from 1 as most frequently used and 5 as least frequently used. Methodology of the paper produced by AAhad M. Osman-Gani and Ronald l. Jacobs was followed. The questionnaires were filled by the personal presence of the researchers in order to ensure the complete understanding. Only 19 questionnaires were filled through telephonic conversation.

RESULTS / DISCUSSION

Changes in information technology are the most frequently experienced technological changes in Pakistani organizations. Many companies have developed training and development programs to cope with technological change. Employee training and skills development helps companies to cope with technological change. However, limited training budgets in SME sector and tough working schedule in large enterprises has constrained the type and frequency of training programs. The following sections present the results by responding to each research question of the study:

1. Frequency of training and development program in organization (in percentage)

The frequency of training and development programs in organizations was measured in terms of once a week to once a year. Training and development program in organization was mainly based on nature of project (23%). Many private sector organizations had one training and development program for three months. Frequency of training and development programs per week was more in SME than large enterprises and SME.

Table 1. Frequency of training and development program in organization (in percentage)

Frequency of training and development	***Private***	**Large Enterprises**	**SME**
Once a week	13.64	11.19	18.75
Once a month	12.12	12.69	10.94
Once in 3 months	23.23	21.64	26.56
Once in 6 months	19.19	20.15	17.19
Once a year	9.60	10.45	7.81
Depends on projects	22.22	23.88	18.75

2. Employee Development Program (in percentage)

In most of the organizations employee development program was for all the employees (38%). Whereas out of all three levels of management, middle level management was enjoying employee development program the most. ***Mostly, entrepreneurs from SME were not very sure about employee position at different management level.*** *These levels were overlapped in SME. Thus entrepreneurs responded as per their own perceptions.*

Table 2. Employee Development Program (in percentage)

Employee Development Program	**PRIVATE**	**LARGE ENTERPRISES**	**SME**
Top Level Management	15.66	16.42	14.06
Middle Level Management	25.25	22.39	31.25
Top & Middle Level Management	21.72	23.88	17.19

All Employees	37.37	38.06	37.50

3. Training Evaluation Method (in percentage)

There are different posts training evaluation methods for measuring the development of the employees in the organizations. The most frequently used training evaluation method is trainee feedback in large enterprises and trainer feedback in SME. Administration through test method is less preferred to supervisory feedback and post evaluation survey methods in private sector.

Table 3. Training Evaluation Method (in percentage)

Training Evaluation Method	PRIVATE	LARGE ENTERPRISES	SME
Trainer Feedback	20.20	17.16	26.56
Trainee Feedback	36.36	42.54	23.44
Surveys/ Questionnaires	19.19	18.66	20.31
Supervisor Feedback	14.14	11.19	20.31
Administration through Test	10.10	10.45	9.38

4. Major Problems in developing employees (in percentage)

The organizations face many obstacles for their employee development program. Training budget is the main constraint in developing employees in SME **keeping working schedule at the second level.** Whereas work schedule is the main constraint in developing employees in large enterprises keeping training budget at the second level.

Table 4. Major Problems in developing employees (in percentage)

Major Problems in developing employees	PRIVATE	LARGE ENTERPRISES	SME
Training Budget	32.77	26.12	48.13
Work Schedule	34.37	37.31	27.50
Deadlines	13.67	17.16	5.63
Limited Manpower	19.19	19.40	18.75

5. What is the nature of differences amongst companies from large enterprises and SME within private sector in using the human resource developmental methodologies to cope with technological change?

On-the-job training and classroom lectures were more frequently used methodologies as compared to other methodologies in both large enterprises and SME. On-the-job training, seminar/workshops, classroom lectures, computer-based training, small group discussions, self-instructional material, overseas training and games and simulation methodologies were comparatively less frequently used in SME as compared to the large enterprises. Audio and video tapes, written tutorials and sensitivity training were comparatively more frequently used in SME than in the large enterprises.

Table 5. Human Resource Developmental methodologies to cope with technological change

Developmental Methodology	PRIVATE SECTOR			LARGE ENTERPRISES			SME SECTOR		
	Mean	SE	SD	Mean	SE	SD	Mean	SE	SD
On-the-job training	3.65	0.09	0.7	3.73	0.11	0.49	3.47	0.18	1.10
Seminars/workshops	3.44	0.08	1.16	3.53	0.10	1.14	3.27	0.15	1.17
Classroom/Lectures	3.68	0.23	0.19	3.78	0.33	0.80	3.47	0.15	1.17
Computer-based training	3.31	0.09	1.31	3.34	0.12	1.36	3.25	0.15	1.20
Small group discussions	3.32	0.09	1.21	3.34	0.10	1.20	3.27	0.16	1.25
Self-instructional materials	3.30	0.14	120	3.49	0.18	1.10	2.91	0.16	1.32
Overseas training	3.17	0.09	1.25	3.25	0.11	1.22	2.98	0.16	1.32
Audio and video tapes	3.32	0.08	1.19	3.29	0.11	1.22	3.39	0.14	1.15
Games and simulation	3.17	0.10	1.36	3.25	0.12	1.34	2.98	0.17	1.39
Written tutorials	3.36	0.09	1.25	3.33	0.11	1.25	3.44	0.16	1.26
Sensitivity training	3.38	0.10	1.45	3.26	0.12	1.34	3.63	0.20	1.04

6. What is the nature of differences amongst companies from large enterprises and SMEs within private sector in using the Human Resource developmental strategies to cope with technological change?

Amazingly stress management strategy was the most frequently used strategy in both the large enterprises and SMEs. Stress management, career planning, goal setting, employee participation and involvement, and facilitation and support strategy are most frequently used strategies in private sector as compared to other strategies. Creating a common vision, goal setting, career planning, negotiation and agreement, job enrichment, self managed work teams and restructuring/reengineering strategies were comparatively less frequently used in SME than in large enterprises. Employee participation, involvement and stress management were comparatively more frequently used in SME than in large enterprises. Communication and education, team building and facilitation and support strategies were almost equally practiced in both the large enterprises and SME.

Table 6. Human resource developmental strategies to cope with technological change									
Strategies	**PRIVATE SECTOR**			**LARGE ENTERPRISES**			**SME SECTOR**		
	Mean	**SE**	**SD**	**Mean**	**SE**	**SD**	**Mean**	**SE**	**SD**
Employee participation & involvement	3.52	0.09	1.27	3.44	0.11	1.25	3.67	0.16	1.30
Facilitation & support	3.50	0.09	1.27	3.50	0.11	1.27	3.50	0.16	1.27
Creating a common vision	3.47	0.09	1.23	3.57	0.11	1.22	3.27	0.15	1.24
Stress management	3.97	0.33	0.69	3.93	0.38	0.37	4.08	0.63	0.76
Team-building	3.45	0.09	1.20	3.45	0.10	1.21	3.45	0.15	1.19
Goal setting	3.57	0.09	1.26	3.70	0.10	1.20	3.28	0.17	1.33
Career planning	3.68	0.27	1.14	3.76	0.39	0.47	3.50	0.15	1.23
Negotiation and agreement	3.40	0.09	1.27	3.47	0.11	1.24	3.25	0.17	1.32
Job enrichment/analysis	3.38	0.09	1.22	3.46	0.10	1.17	3.22	0.16	1.29
Self-managed work teams	3.40	0.08	1.17	3.49	0.10	1.19	3.22	0.14	1.13
Restructuring/reengineering	3.29	0.09	1.28	3.40	0.11	1.24	3.06	0.16	1.32
Communication and education	3.45	0.09	1.29	3.45	0.11	1.24	3.45	0.18	1.40

DISCUSSIONS AND CONCLUSIONS

Employee training has been helping companies to cope with technological changes in Pakistan. However, constrained training budgets, work schedules, deadlines, and limited manpower have restricted the use of the required training programs. Training is an extremely powerful and an effective tool for motivating and retaining the employees.

It is recommended that companies should increase their training budgets to accommodate more training programs for employees, especially in SME sector. However, it should be cautioned that training should be viewed as an investment and not an expense. Training programs are critical for upgrading employee skills when technological change occurs. Thus, there is a vital need for more resources to be allocated to training. Training programs should be structured to include technical training as well as management training. Technology-based training and development program should be communicated when human resources join the organizations and thereafter from time to time. Companies should continue using structured forms of on-the-job training. Computer-based training should also be considered to enable employees to familiarize themselves with computer-related and Internet applications. However, the use of specific training methods would depend on company needs. Short training duration allows companies to adapt to new technological changes and this enables them to gain an advantage over their competitors. Thus, duration of training sessions should be appropriate enough to provide employees sufficient time to absorb the new knowledge.

HRD is extremely intricate. It requires a systematic approach if it is to be beneficial for both the employee and the organization (Durrani, 1987). Proper HRD practices and their accurate implementation help human resources to put their best efforts to bring benefit to the organization. This in turn brings benefit for the human resources themselves (Choudhuri, 1995). HRD department should also develop curriculums, train the instructors and trainers. The necessary infrastructural facilities required for such activities should also be provided.

FUTURE DIMENSIONS / SUGGESTIONS

Firstly, this study can further be enhanced by including more organizations in the sample throughout the country to generalize the results. Furthermore to confirm the validity of the results a similar study can be carried out in different industries. Secondly the same study can be conducted in both public and private sectors of the economy in which health industry, oil & gas industry, telecom industry and banking industry are some of the important industries in the current economic conditions of Pakistan.

Future researchers could use a larger sample of companies to improve on representation. The study covered the aspect of only technological change and its impact on HRD strategies; hence researchers may want to consider studying other types of changes, such as organizational changes. Reasons driving technological changes and the frequency of changes can be investigated to determine an appropriate period for companies to retrain workers to cope with new changes.

LIMITATIONS OF STUDY

- ¾ This research was exclusively conducted in two main cities of Pakistan i.e. Islamabad and Rawalpindi and not in other cities like Karachi and Lahore. Hence it is hard to say that almost all organizations in all main cities of Pakistan behave accordingly (as our result suggests).
- ¾ Small sample size was taken by the researchers because most of the organizations in Islamabad/ Rawapindi were reluctant to provide proper information.

REFERENCES

APEC (2004), Communiqué: Fourth APEC Science Ministers' Meeting. Christchurch, New Zealand: Asia-Pacific Economic Cooperation.

Bates, R., 2002, 'Value priorities of HRD scholars and practitioners', *International Journal of Training and Development,* Vol.6(4), 229–339.

Bernstein, J.I., 1983, 'Training and manpower development', *Pakistan & GULF Economist.* Vol.2(12), 22-23.

Choudhuri, A. H. M. N.,1995, 'Career planning and development of human resources in banks', *Bank Parikrama-quarterly journal of Bangladesh institute of bank management, Vol.20(2)*.54-66.

Clarke, N.,2004, 'HRD and the challenges of assessing learning in the workplace' *International Journal of Training and Development, Vol.8(2),* 40–156.

Durrani, M. A.,1987, 'Employee development exploration of issues, problems and prospects' ,.*Pakistan management review. Vol.*28(1-4), 10-22

Gene Johnson, "The Strategic Management of Human Resources in New Zealand " McGraw-Hill Company New Zealand Limited 2003 :p.86

Jafri S. M. Y.,1976, 'Career planning some thoughts', *NIPA Public Administration Review, Vol.*(3),.38-43

Mulcahy, D. and James, P., Evaluating the contribution of competency-based training: an enterprise perspective. International Journal of Training and Development, *Vol.*4, 3, 2000: p 60–175.

Ogden, R.,1961 'Training and executive development', *Pakistan management review, Vol. 2(6),* 23-28.

Osman-Gani, A. M. (1991), International Transfer of Management Technology Within Multinational Enterprise: A Cross-National Study of Managers' Perceptions . Unpublished doctoral dissertation, The Ohio State University, Columbus, Ohio, USA.

Osman-Gani, A. M. (1996), 'International Human Resource Development', in G. Thong (ed.), Human Resource Issues in Singapore. Singapore: Addison-Wesley Publishing.

Osman-Gani, M. A.,2005 'Technological change and human resource development practices in Asia: a study of Singapore-based companies' *International journal of training and development, Vol. (* 9)4.

Qureshi A M. "Career planning concept and issues". Pakistan Administration. XXI(1), Jan-1984: p.107-115

Siddiqi, F.K., 'Training and Development', *Managem ent Pakistan, Vol. 7(6),* 2 5-29

Thurow, L. C. (1996), The future of capitalism: How today's economic forces shape tomorrow's world. New York: William Morrow and Company.