1. Introduction

In knowledge-intensive organisations, human resource management (HRM) practices are one of the major antecedents of knowledge creativity through knowledge sharing. This is achieved by leveraging human capital and the provision of benefit to both individuals and organisations through improved capability (Ipe, 2003; Lin, 2007). Despite the potential here, the knowledge management (KM) literature has made only limited use of HRM concepts and frameworks (Connelly, Zweig, Webster, & Trougakos, 2012). Recent studies suggest that knowledge sharing can be advanced through bridging both KM and HRM fields (Oltra, 2005).

The knowledge management literature has explained the background of employees' knowledge sharing. However, there is a lack of research on the strength of the relationship between HRM practices and knowledge sharing behaviour and organisations need to pay attention to HRM practices to facilitate knowledge sharing behaviour (González, Giachetti, & Ramirez, 2005). Similarly, little research has examined HRM and knowledge sharing linkages in Asian countries and merit further investigation. Based on our results, this study offers few suggestions. First, we suggest that HRM practices facilitate knowledge sharing. While previous research has taken a broad perspective on the role of employees' collaboration (Tsai & Ghoshal, 1998), this study demonstrates that both HRM and KM are interlinked and support each other, but, both are emerging research concepts (Jimenez-Jimenez & Sanz-Valle, 2013). Second, we suggest that most empirical research in the field of KM was based on information and communication technology; however, most of the knowledge resides in an individual's brain, (i.e. tacit knowledge). Therefore, knowledge sharing should be people-driven, rather than driven by technology.

Further, several empirical studies have examined the enablers of knowledge management in knowledge intensive firms (KIFs), particularly in South Asian region (Malik & Malik, 2008). There is, however, little empirical research to test the effect of HRM practices on knowledge sharing behaviour using employees' perceptions in Pakistani KIFs. This study examines the effect of HRM practices on employees' knowledge sharing behaviour and tests the knowledge sharing outcomes at organisational and individual level.

This study aims to focus on a developing country and investigates the strength of the relationships between HRM practices and employees' knowledge sharing behaviour, based on their perceptions. The paper is structured so that following this introduction, we review the relevant literature, and consequential hypotheses are proposed to explain how HRM practices relate to knowledge sharing and capability. We then briefly present the data collection process, followed by results of hypotheses testing, discussion and conclusions.

2. Literature review and hypotheses

There are certain HRM practices that can be effective in supporting knowledge sharing behaviour in knowledge intensive organisations, like, recruitment and selection, employees' collaborative practices, reward systems, employees' recognition, and performance appraisal (Cabrera, Collins, & Salgado, 2006). In this study, specific HRM practices including: Recruitment, reward systems, employees' collaboration and recognition are examined for possible effects on employees' knowledge sharing behaviour and its outcomes.

2.1 HRM practices

2.1.1 Employees' recruitment

In the staffing function, recruitment and selection is a process which determines the right candidate for a specific organisation. The recruitment and selection cycle starts with advertising in order to attract potential candidates, which creates a pool of applicants. The selection process determines the applicants (through different assessments) who match the job criteria (Bartram, 2000). More recently, due to the development of the dynamic business environment, the selection process focuses on selecting those candidates whose potential matches organisational objectives rather than matching a particular role within an organisation (Rerup & Feldman, 2010).

2.1.2 Rewards and recognition

The reward systems and employees' recognition are key components of HRM practices that can enhance employee motivation to share knowledge. To achieve this, rewards should be given to those employees who spend their time facilitating and working with other staff, especially in collaboration with other members in work places (Song, 2009). Employees perceive that open and transparent rewards and recognition can influence their knowledge sharing behaviour and add value to the organisational capability (Cabrera, Collins, & Salgado, 2006). Further, employees' recognition can create a sense of legal obligation among employees to share their personal knowledge with other members to achieve set targets (Song, 2009). Thus, organisational support, in terms of employees' recognition can reduce individual knowledge sharing barriers and support individual learning. Knowledge learning is a behavioural construct; therefore, rewards and recognition should be given to effect a change in the behaviour of an individual to participate in knowledge sharing activities.

2.1.3 Employees' collaboration

Collaboration is a mechanism to act systematically and think broadly (Sahin, 2007). The term 'employee collaboration', used in this study, refers to employees' engagement and participation within an organisation. This study uses the term 'employee collaboration' as a HRM practice, when employees engage in face-to-face interactions and work together informally and formally for common goals in their organisations. Knowledge sharing acts as a goal of employees' collaboration. Sahin (2007) put emphasis on employees' collaboration through team work, and the establishment of communities of practice for knowledge sharing. Employees' collaboration at the organisational level can be enhanced by setting different achievable targets through the use of multi-disciplinary teams within the organisation.

2.2 Antecedents of knowledge sharing (The role of trust)

There are internal and external factors attached to employees knowledge sharing. The internal factor is perceived power (within the organisation) that results from knowledge sharing, while the external factor includes building trust with the recipient through Interpersonal similarities (Ipe, 2003). HR managers can facilitate interpersonal trust between employees through providing a team-based environment. Also, employees can mingle easily in networks on and off the job, which can boost the knowledge sharing process.

2.3 Outcomes of Knowledge sharing

The present study discusses organisational and individual capability as outcomes of knowledge sharing. The term 'organisational capability' is used in terms of organisational innovation

capability and *organisational knowledge capability.* Innovation capability refers to how organisations can provide new products/services to satisfy their customers (Shu-hsien, Wu-Chen, & Chih-Chiang, 2007), whereas organisational knowledge capability refers to the organisational tools, systems and operating philosophies that can store employees' knowledge and enhance the flow of knowledge within an organisation from one level to another (Youndt, 2004). On the other hand, the term 'individual capability' in this study is used in terms of employees' personal development. Employees improve their learning and develop skills by sharing knowledge with other colleagues. Knowledge sharing in organisations also helps to improve employees' personal development by validating their tacit knowledge. Validation of knowledge occurs when colleagues who receive the knowledge utilise it, and provide feedback to the knowledge source.

Based on our literature review we propose the following hypotheses that are based on employees' perceptions within their organisations:

H1: *Employees' recruitment and selection has a positive effect on employees' knowledge sharing behaviour.*

H2: *Rewards and recognition have a positive effect on employees' knowledge sharing behaviour.*

H3: *Employee collaboration has a positive effect on employees' knowledge sharing behaviour.*

H4: *Interpersonal trust (as an antecedent of knowledge sharing) between employees has a positive effect on employees' knowledge sharing behaviour.*

H5: *Employees' knowledge sharing has a positive effect on organisational capability.*

H6: *Employees' knowledge sharing has a positive effect on individual capability.*
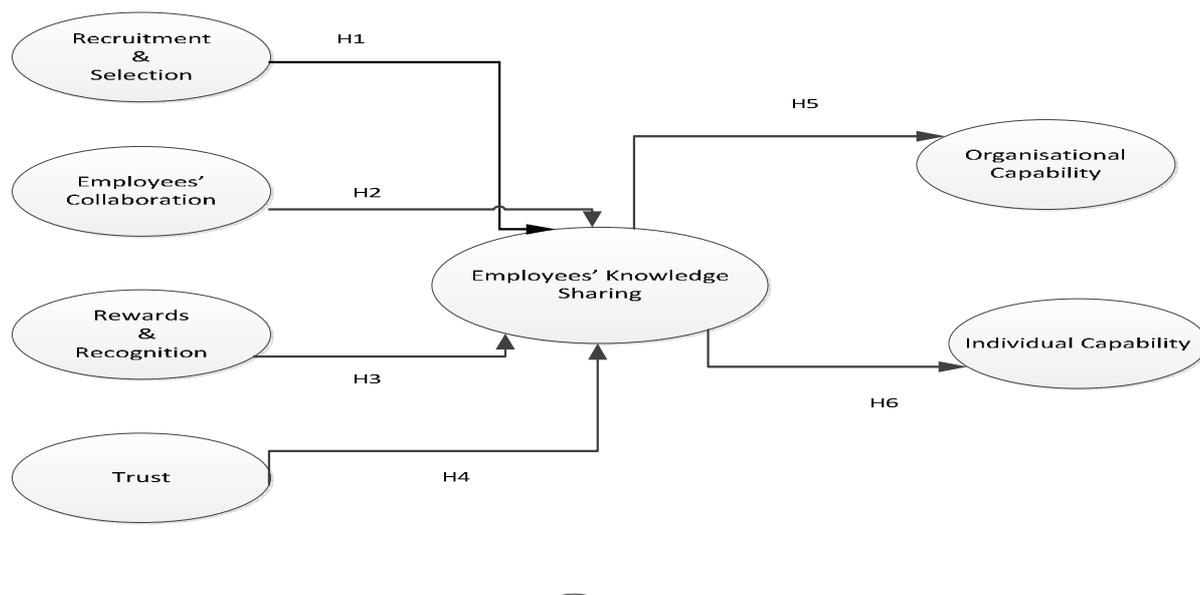

Figure 1: Proposed model

3. Survey instrument

Question items of survey instrument were adopted from previous literature, as shown in Table 1. For the detail of the studies from which these items were adopted is in Appendix C. Moreover, questionnaire items of the survey are shown in Appendix D.

Table: 1 Instrument measurement

Construct	Dimension	Items description	References
HRM practices	Recruitment & Selection	Item1-4(process) Item 5-8(process) Item 9-14 (process) *Item 15- (p-o)	(Kuldeep, 2004) (Edgar & Geare, 2005) (Lepak & Snell, 2002)
	Employees' Collaboration	Item 1-3 (participation) *Item 4-8 (teamwork) Item 9-11(social-capital)	(Kuldeep, 2004) (Youndt, 2004)
	Rewards & Recognition	Item1-6 (fairness) Items7-9 (process) Item 10-12 (recognition)	(Sweeney & McFarlin, 2005) (Balkin & Gomez-Mejia, 1990) (Davenport & Prusak, 1998)
Knowledge sharing	Sharing	Items 1-3 (experience) item 4-6 (information)	(Bock, Zmud, Kim, & Lee, 2005), (Reychav & Weisberg, 2009)
	Donating and collecting	Item 7-16	(Van den Hooff & Van Weenen, 2004)
Trust	Interpersonal	Item1-3(peers), and Item4-5(management) Item 6-8	(Cook & Wall, 1980) (Mooradian, Renzl, and (Matzler, 2006)
	Competence-based	*Item 9-10	
Individuals' Capability	Innovation Learning	*Item 1-3(innovation) *Item 4-5(feedback) *Item 6-7 (feedback)	
Organisational capability	Innovation	Items 1-5 (product and services) Item 6-7 (storage)	(Shu-hsien, Wu-Chen, & Chih-Chiang, 2007) and (Youndt, 2004)

Items designed by researchers

4. Data collection

We obtained samples from populations in the educational and telecommunication sectors. For this study, the population of interest was employees identified as knowledge workers in Pakistani organisations. A simple random sampling (probability) technique was applied to in these sectors, to select sample organisations. Initially thirty companies were contacted, however, due to severe weather events and the consequential flooding which occurred in

Pakistan at the time the data was collected, only 19 companies made up the final sample. A total of 600 questionnaires were distributed, out of which, a total of 390 useable questionnaires were used in the data analysis, representing a response rate of 65%. The response rate was encouraging, given that the questionnaire was relatively long. Baruch (1999) suggests that the average response rate is 55.6% in academic studies based on 175 studies reported in journal publications. In this research contact persons are used for survey distribution and collection. Several research scholars used contact person(s) for the distribution of their surveys, for instance: Edgar and Geare (2005).

5. Results

5.1 Respondents' characteristics

Some of the demographical characteristics in this study are similar to those in the research already conducted in Pakistani KIFs (for instance, Shahzad, Sarmad, Abbas, & Khan ,2011; Kashif, Khan, and Rafi , 2011) in the Pakistani telecommunications sector, and in higher education institutes (Shahzad, Bashir, & Ramay, 2008). Table 2 shows the comparisons of the demographical characteristics of earlier research in Pakistani KIFs and this study. The ratios are described in terms of the total respondents of respective study.

Table 2: Respondents' characteristics

Demographics	Category	This thesis	Kashif et al (2011)	Shahzad et al (2008)	Shahzad et al (2011)
Age	≥ 30 years	Close to half	Over half	Over half	Over half
Gender	Males	Over two third	Over two third	--	Over two third
Education level	Masters degree	Over half	Over half	Over half	Almost half
Work experiences	2-5 years	Over two third	Over two third	Almost half	Over two third

5.2 Internal consistency

In order to ensure the reliability of the survey instrument, internal consistency reliability was computed. Litwin, (1995) suggests ... "Internal consistency is an indicator of how well the different items measure the same issue" (p. 21). Cronbach's alpha is a useful indicator of internal consistency, threshold value of Cronbach's alpha is 0.60 as suggested by researchers (Hair, Black, Babin, Anderson, & Tatham, 2005). As shown in the Table 3, the Cronbach's alpha values of all variables are above than 0.60 in this study.

Table 3: Internal consistency

Latent construct	Cronbach's Alpha
Recruitment and selection	0.82
Rewards and recognition	0.80
Employees' collaboration	0.85
Trust	0.93
Employees' knowledge sharing	0.87
Organisational capability	0.78
Individual capability	0.77

5.3 Exploratory Factor analysis

Scree test shows seven items should be retained which is confirmed by using parallel analysis as shown in Appendix A and B respectively. Varimax factor rotation is used with cut-off value of factor loadings 0.40 or above. The factor rotation results show some new factors which were labelled according to their respective items' cluster. The proposed model is revised based on factor analysis results as shown in the figure 2.
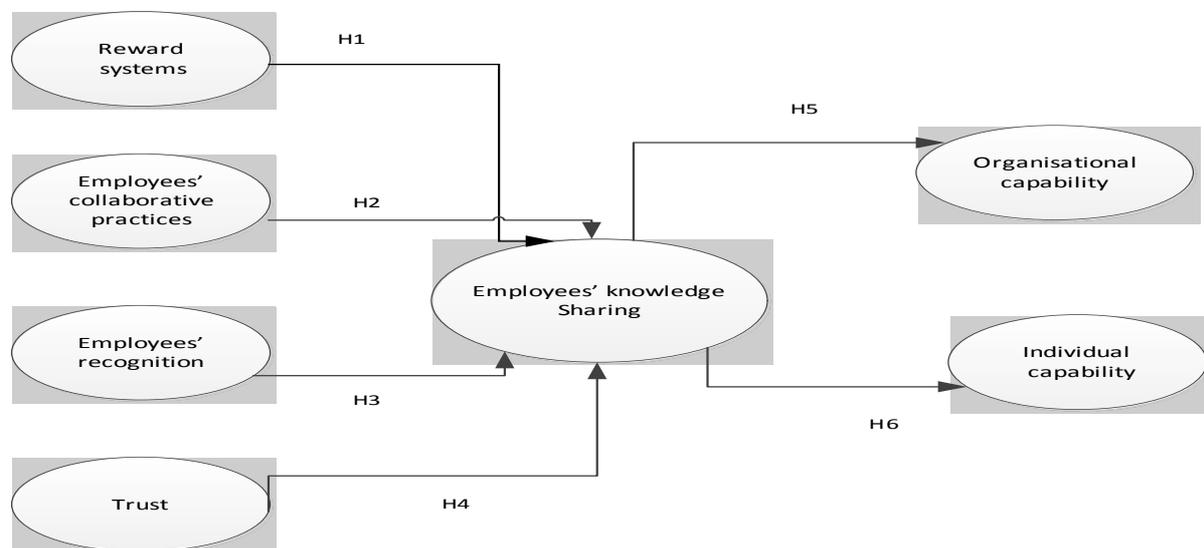

Figure 2: Revised model (structural model)

5.4 Measurement model fit

For the statistical treatment of the hypothesised proposed model (as shown in Figure 1), we used the two-step method recommended by several researchers (Hair, Black, Babin, Anderson,

& Tatham, 2005; Lin & Lee, 2004). Thus, we first developed the measurement model based on confirmatory factor analysis (CFA). On the results of CFA, we built the structural model (in AMOS statistical software) based on our revised proposed model as shown in Figure 2. In this study, for further data analysis, we have used our revised model.

The methodology used in data analysis of this paper is robust because CFA and Structural equation modeling (SEM) are likely to be better approaches than the linear regression method. This is because CFA can test specific hypotheses about the data. Moreover, it is also very helpful to use a combination of EFA and CFA, which we have used. EFA tests can be run as an initial study that can provide a foundation for specifying a measurement model through CFA (Fabrigar, et al., 1999). In the measurement model (model-fit) procedure, several methods are available. However, the most widely used is maximum likelihood (ML) that provides the computation of a wide range of indices to assess the goodness of fit of the model. ML also provides statistical significance to test these factor loadings and correlations between factors (Brown, 2006).

5.4.1 Goodness of fit indices

Six common measures were used, to measure the goodness of fit of the measurement model. Segars and Grover (1998), and Lin and Lee (2005), suggest that the common measures are, the ratio of χ2 (statistics to the degree of freedom (df), comparative fit index (CFI), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed fit index (NFI) and root mean square error of approximation (RMSEA).

As shown in Table 4, normed χ2 (the ratio between χ2 and the degree of freedom to assess the model fit) was 2.96. This result is less than 3.00 that indicates a good model fit (Bagozzi & Yi, 1988), Other fit indices also show good fit for this structural model. The goodness-of-fit index (GFI) is 0.94 and exceeds the recommended cutoff level of 0.90. The comparative fit index (CFI) and normed fit index (NFI) are 0.92 and 0.89 and exceeds the recommended cutoff values (Browne & Cudeck, 1993; Ryu, Ho, & Han, 2003). The root mean square error of approximation (RMSEA) is 0.07, which is below to the maximum recommended value of 0.08 (Browne & Cudeck, 1993). Hence, our model shows a good fit according to the data set.

Table 4: Measurement model fit

Goodness-of-fit measures	χ2 Test statistics/df	GFI	AGFI	CFI	NFI	RMSEA
Recommended values	≤ 3.00*	≥0.90*	≥0.90*	≥0.90*	≥0.80**	≤ 0.08*
CFA model	2.96	0.94	0.90	0.92	0.89	0.07

*(Bagozzi & Yi, 1988; Browne & Cudeck, 1993; Hu & Bentler, 1999) and **(Ryu, et al., 2003)

5.4.2 Hypothesis testing

To determine the validity of the paths in our research model, the statistical significance of all the structural parameter values were examined. The results shown in Table 5 suggest that hypotheses, H2, H4, H5 and H6 were strongly supported, whereas, hypotheses H1 and H3 were not supported as shown in Table 5. The structural model with results is shown in Figure 3.

Table 5: Hypothesis testing

Hypothesis	Path	Path coefficient	Std. error	Critical ratio	P -value	Remarks
H1	Reward → KS	0.025	0.074	0.341	0.733	Not supported
H2	Collaborative practices → KS	0.345	0.129	2.671	0.008**	Supported
H3	Recognition → KS	-0.077	0.103	-0.744	0.457	Not supported
H4	Trust → KS	0.570	0.151	3.780	***	Supported
H5	KS → Organisational Capability	0.354	0.065	5.403	***	Supported
H6	KS → Individual Capability	0.260	0.058	4.516	***	Supported

*** Significant at p < 0.001, and ** Significant at p < 0.01
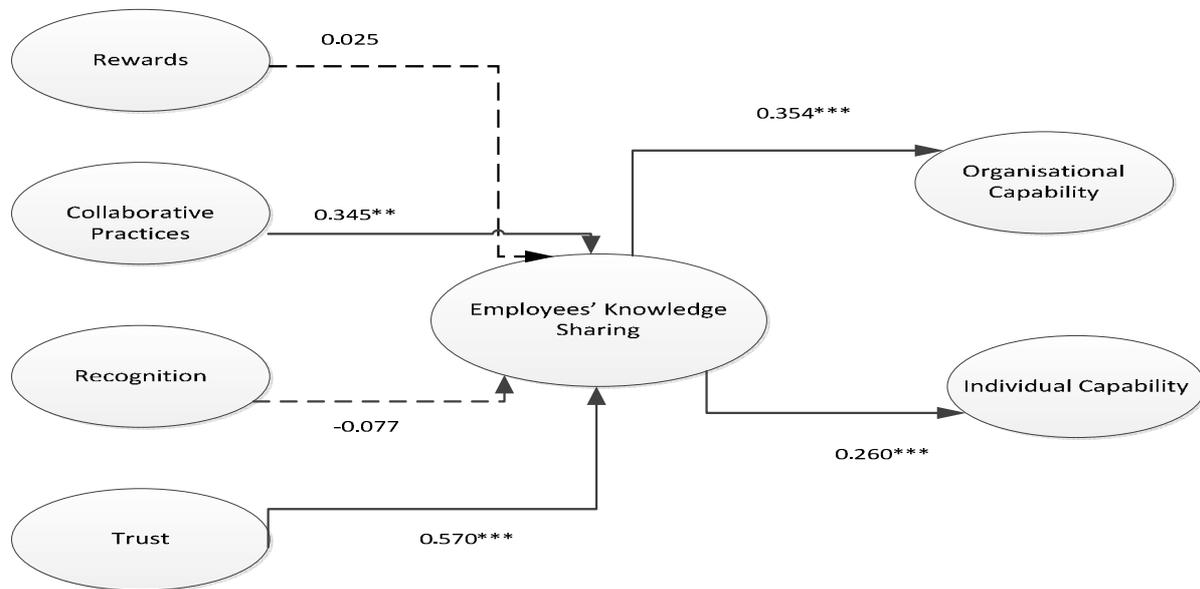
*** Significant at p < 0.001, and ** Significant at p < 0.01

Figure 31: Structural model with results

5.4.3   An Alternative Model

Although the fully mediated model was shown to be a good fit, the value of chi- square indices is higher than that of the recommended value (see Table). However, other model fit indices showed a good fit with this model. One limitation to the chi- square index is that it is sensitive to sample size and can be ignored if other indices show a good fit (MacCallum, Browne, & Sugawara, 1996).

Statisticians suggest that for any given SEM model, there are possibilities of alternative models that may have a better model fit. In the last two decades, the idea of alternative structural model is gaining acceptance, and research indicates that the ratio of using an alternative model was one of 72 published research articles recognising the option of alternative models (Chin, 1998). An alternative model was developed introducing new direct paths between latent constructs to increase the possibility of capitalising the chances of a model fit. The alternative model was designed by introducing additional paths H7 and H8, as shown in Figure 4. The alternative model was examined in a nested approach to examine the chi-square test. Therefore, non-significant paths of the full mediated model were retained.
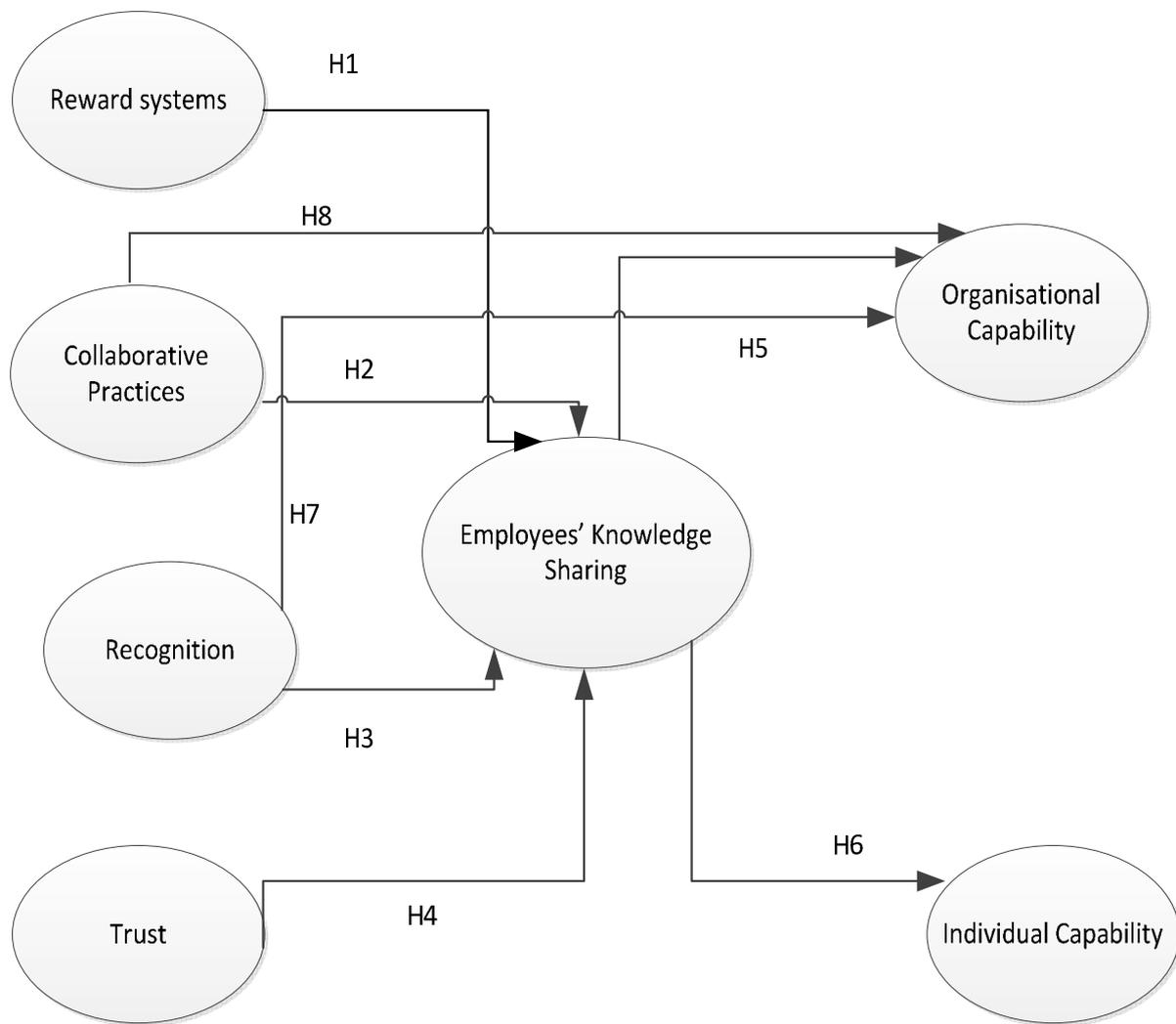
Figure 4: An alternative structural model

Table 6: Alternative model results

Hypothesis	Path	Path coefficient	Std. error	Critical ratio	P -value	Remarks
H1	Reward → KS	0.026	0.073	0.359	0.720	Not supported
H2	Collaborative practices → KS	0.339	0.131	2.592	0.010*	Supported
H3	Recognition →KS	-0.139	0.089	-1.551	0.121	Not supported
H4	Trust→ KS	0.568	0.142	3.989	***	Supported
H5	KS →Organisational Capability.	0.263	0.074	3.536	***	Supported
H6	KS→Individual Capability.	0.256	0.057	4.508	***	Supported
H7	Recognition→ Organisational Capability.	0.447	0.101	4.408	***	Supported
H8	Collaborative Practices→ Organisational Capability.	0.229	0.101	2.261	0.024*	Supported

*** Significant at $p < 0.001$, and * Significant at $p<0.05$

The alternative structural model is shown in Figure 5 with results
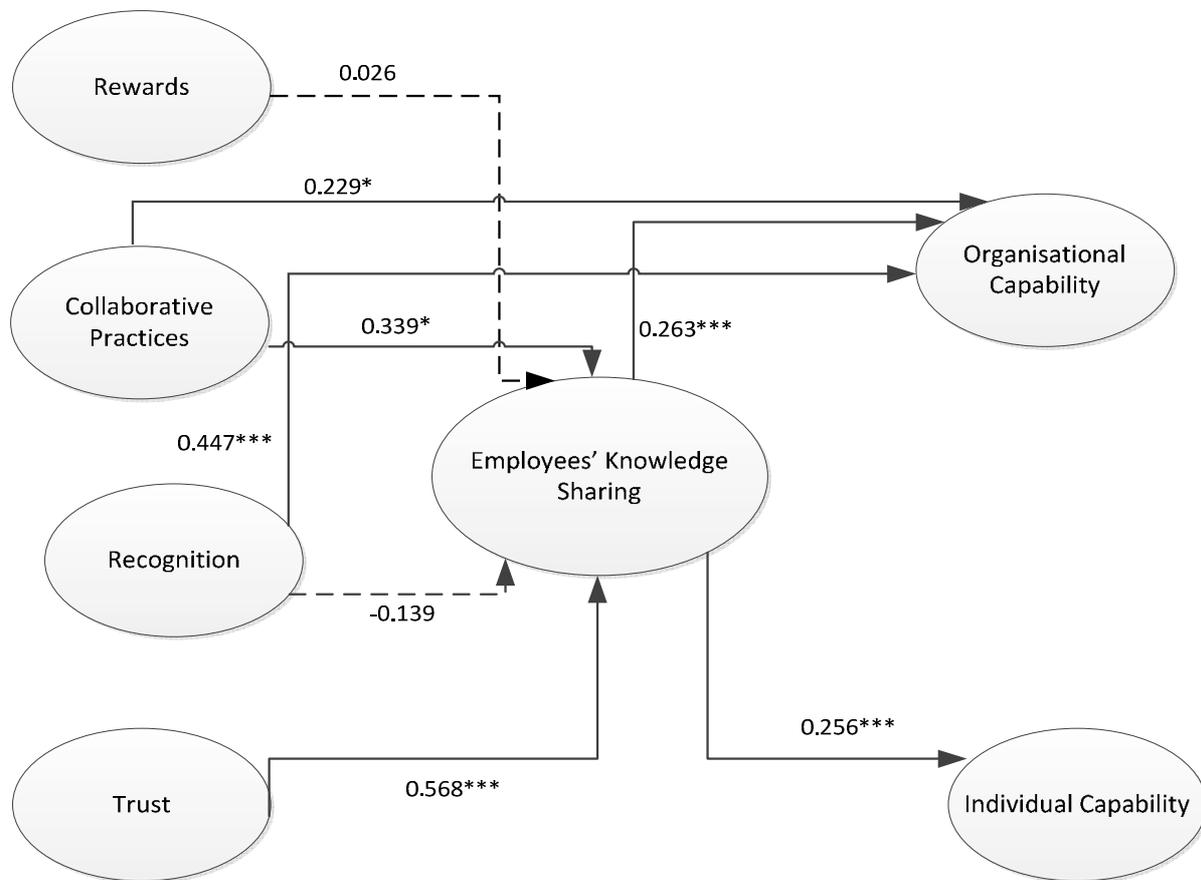
*** Significant at p < 0.001, and * Significant at p<0.05

Figure 52: Alternative structural model with results

5.4.5 Model Comparison

The comparison of the full mediated model and the alternative model is shown in Table 7. Although a fully mediated model is supported, the alternative model demonstrates a better fit to the data and was accepted as the final solution. Fit indices have been improved including GFI, AGFI, CFI, and RMSEA in the alternative model. Model fit summary of both structural and alternative models are shown in Appendices E and F respectively.

Table 7: Comparison of Structural Models

Goodness-of-fit measures	x^2	GFI	AGFI	CFI	NFI	RMSEA
Test statistics/df						
Recommended values	≤ 3.00*	≥0.90*	≥0.90	≥0.90	≥0.80**	≤ 0.08*
Full mediated model	3.28	0.91	0.87	0.90	0.84	0.07
Alternative model	2.80	0.93	0.90	0.90	0.87	0.06

* (Bagozzi & Yi, 1988; Browne & Cudeck, 1993) and **(Ryu, Ho, & Han, 2003)

6. Discussion

In the discussion of this paper, we will discuss the results of alternative structural model. Our results suggest that employees' collaborative practices show a positive effect on their knowledge sharing behaviour at (β=0.339, p< 0.05) and organisational capability at (β=0.229, p< 0.05).These result are consistent with previous research on knowledge creativity and organisational learning (Hsu, 2008). The finding is also consistent with previous studies of employees' knowledge sharing behaviour in knowledge intensive organisations, reported by Sohail and Daud (2009) in Malaysia, and Seonghee and Boryung (2008) in South Korea.

The result shows that employee collaborative practices directly affect knowledge sharing behaviour in the workplace. This result supports the view that employee collaborative practices provide opportunities for employees to discuss their successes and failures, and consequently improve their professional relationships (Van den Hooff, Schouten, & Simonovski, 2012). Employees perceive that their collaborative practices in sharing their experiences/knowledge with colleagues is beneficial at an individual level, and can improve their decision-making in their workplaces.

Employee collaborative practices through informal participation are key facets of HRM practices because employees learn different types of knowledge and skills relevant to their workplaces when they participate in informal meetings with experts. Our results show that employee collaboration when employees' share their success and experiences with other colleagues has a strong effect on their knowledge sharing behaviour. In addition, organisational environments that support collaboration can affect employees' knowledge sharing behaviour. These findings are consistent with Sahin (2007).

Most of the literature argues that reward systems are one of the main components of HRM practices that can enhance an employee's motivation to share knowledge. Material rewards

have a positive effect on employees' knowledge sharing behaviour (Ipe, 2003). Rewards may be given to those employees who spend their time facilitating and working with other staff, especially in collaboration with other employees. Transparent rewards in organisations encourage knowledge sharing activities (Riege, 2007). However, employees perceive that open and transparent rewards should be given to those employees who spend their time supporting other members by adding value to the organisation (Cabrera, et al., 2006).

Contrary to the above expectations, the results of this study shows that reward systems have no statistical significant effect on employees knowledge sharing behaviour at (β=0.026, *p*>0.05). This result shows that employees' knowledge sharing behaviour is independent of the reward system. This result indicates that monetary incentives are not an influential technique to improve employees' knowledge sharing behaviour in KIFs. This finding supports the previous research on the causative relationship between reward systems and employees' knowledge sharing behaviour. For example, Bock and Kim (2002) suggest that rewards (routine annual monetary rewards) negatively impact employees' knowledge sharing behaviour in the Korean public sector. Similarly, such routine reward systems can only provide temporary compliance in regards to employees' knowledge sharing behaviour (Dong, Liem, & Grossman, 2010).

Temporary compliance is not an effective tool to change employees' knowledge sharing behaviour in KIFs (Bock & Kim, 2002; Dong, et al., 2010). Temporary compliance related to compensation for routine daily jobs may discourage innovation and knowledge sharing. Organisations may introduce performance-based rewards for employees to promote organisational knowledge sharing and can link these rewards systems to employees' personal development needs (Riege, 2007).

Another reason that rewards have no effect on knowledge employees' sharing behaviour in KIFs is due to younger employees who have less job experience in Pakistani KIFs. Almost half of the respondents were under 30 years of age, and more than 85% had less than five years' work experience. It could be argued that employees with relatively little work experience in Pakistani KIFs in the telecommunication and higher education sectors are more inclined towards career development than monetary rewards. The monetary rewards may be important but are not a priority. This perception is known as employees' instrumentalism, which is "...the belief that work is primarily a means to non-work ends rather than a central life interest" (Macky, 2012, p. 1). Hence, it could be argued that young Pakistani employees are orientated more towards knowledge sharing for their own personal development rather than towards incentives in knowledge intensive organisations.

Kohn (1993) describes several reasons why rewards may not be effective in workplaces. These reasons can be applicable in the knowledge sharing context. Kohn (1993) suggests that reward systems can negatively affect and terminate relationships among employees and managers. This occurs because employees who are rewarded feel they are achievers, while other employees may feel they are losers because they are not rewarded for their efforts. This situation may create unnecessary competition among employees. Kohn (1993) also suggests that managers may use the reward system as a tool to get more out of their employees. Therefore, employees tend to consider rewards as a punishment rather than as an incentive. However, Kohn's (1993) results are based on managers' and CEOs' perceptions, and not on the perceptions of employees. However, the findings of this study are based on employees' perceptions which suggest that rewards not effective in improving knowledge sharing behaviour

when compared with other HRM practices such as employee collaboration.

The results of this study shows that employee recognition has no statistically significant effect on employees' knowledge sharing behaviour at (β= -0.139, p> 0.05). This result suggests that recognition, as a motivational technique to share knowledge, is not effective as was first thought before the data collection and analysis of this study. This result is contrary to several studies that found recognition can be used as a motivational technique to influence employees'' knowledge sharing behaviour (Chen & Cheng, 2012). Nevertheless, the finding of this study that recognition has no effect on employees' sharing is supported by Shenkar and Ronen (1987) who conducted a cross-cultural study which investigated the interpersonal norms of different employees, particularly from Asian culture. Shenkar and Ronen suggest in this study that employees in Asian culture are not motivated by non-monetary incentives (for instance, recognition and promotion) but are influenced by the need to complete the targets set by their managers. Our results are consistent with Wolfe and Loraas, (2008), they suggest that employees' knowledge sharing may be independent of employee recognition when the work environment discourages knowledge sharing and encourages knowledge hoarding due to unfair incentives. Hence, employee recognition may not positively influence knowledge sharing behaviour when the incentives are not fair and are merged with targets set by management. Both these issues are related to poor management policies in KIFs.

Employees perceive that poor organisational policies regarding employee recognition may adversely affect their knowledge sharing behaviour (Riege, 2005). For example, organisational policies which set targets create a competitive environment among employees which may discourage collaboration and may lead to knowledge hoarding. Such policies fail to measure the potential abilities and knowledge of employees as an employee's performance is determined only on results (Osterloh & Frey, 2000). Hence, knowledge sharing behaviour is independent of non-monetary incentives when incentives are perceived as not being fair measures of an employee's input (knowledge) (Riege, 2005).

This study found that employees' knowledge sharing has a strong positive effect on organisational capability at (β=0.263, p< 0.001). This result is consistent with previous work on knowledge sharing and organisational capability. Lin (2007) suggests that employees' knowledge sharing has positive effect on organisational capability, particularly in terms of learning and innovation capability through implementation of innovative ideas. Similarly, a research conducted in Spanish companies, suggest that positive employees' knowledge sharing behaviour can affect organisational capability through improved learning capability (López-Cabrales, Real, & Valle, 2011). Further, our results show that employees' knowledge sharing has an effect on individual capability at (β=0.256, p< 0.001). This result is consistent with that reported by Reychav& Weisberg (2009).

This paper contributes in literature and practices, first, from analysing collaborative practices and knowledge sharing behaviour. An important feature that is common in KIFs, where, knowledge is considered to be a source of power. The results of this study show that employees' collaborative practice directly has an effect on their knowledge sharing behaviour in the work places. This result supports that the view that employees' collaborative practices provides opportunities for employees to discuss their past successes and failures, and

consequently improves professional relationships in their organisations (Van den Hooff, Schouten, & Simonovski, 2012).

Second contribution comes from analysing the rewards and recognition as part of HRM practices in encouraging knowledge-sharing behaviours. Our findings suggest that rewards are not significantly associated with employee knowledge sharing behaviour. Further, as discussed earlier, Kohn's (1993) results were based on managers and CEO's perceptions and not on the perceptions of employees. Management opinions may not reflect the actual knowledge sharing process, as most of the managers perceive that if employees are not doing something in the workplace, they are wasting their time and are not working productively (Riege, 2005). This study focuses on actual knowledge owners at lower levels (i.e. employees rather than manager) about how HRM practices influence knowledge sharing and knowledge sharing outcomes. Therefore, these findings can assist in our understanding of HRM and KM linkages through the lens of employees' perceptions that are at the lower level of organisational structures. This study contributes to the theory in terms of HRM and KM linkages to better understand employees' perceptions rather than through senior management's perceptions about the impact of HRM practices on employees' knowledge sharing behaviour.

This study finding are based on employees perceptions and suggests that rewards are less effective to improve knowledge sharing behaviour compared to other HRM practices like employees' collaboration and participation. This study suggests that employees' perceptions about incentives in both telecommunication and higher education sectors are similar to the perceptions of the managers. This study shows emphasis on employees' personal development in two knowledge based business sectors of Pakistan. Some reasons for personal development could be due to the new emerging technologies, current dynamic business environment and more opportunities for experienced individuals around the globe.

It could be argued that several studies with purposes similar to this research have also utilised similar statistical technique in the field of HRM. For instance, Camelo-Ordaz, et al., 2011; Lopez-Cabrales, et al., 2011 have applied the SEM technique on a single sample. Further, this study has also used various fit indices along with chi-square (χ2) to support the model fit. Although the chi-square (χ2) is sensitive to sample size, the fit indices used in SEM are insensitive to sample size (Fan, Thompson, & Wang, 1999).

6.1 Limitations and future research

Although our results are persuasive, there are several limitations to this study, and the results should be interpreted with some caution. Further examination and additional research should be conducted before applying these findings to HRM practice. First, the sample was drawn from two Pakistani sectors; hence, research samples from other Pakistani business sectors including banking, health and services sectors can be included. Further, the research model can be tested further using samples from other countries, since cultural differences among organisations affect employees' perceptions regarding knowledge sharing, and further testing would provide greater insight into the research questions. Second, several significant results have been obtained; however a larger sample, that brings more statistical power, would allow more sophisticated statistical analysis and greater precision.

7. Conclusion

We conclude that our results show that Pakistani employees perceive that their personal and professional developments through collaborative practices are more important to improve organisational capability than are rewards and recognition. In contrast, reward systems and employees' recognition have no impact on employees' knowledge sharing behaviour. The reason we can make such a claim is because employee knowledge sharing behaviour is independent of rewards and recognition. We suggest that our results may be indicative that the first and highest priority for organisations, at least the ones studied in Pakistan, is to provide support for employees' collaborative practices. In addition, knowledge management in Pakistan is in its infancy stage. So to boost the knowledge sharing processes within organisations, managers could focus on their policies related to managing employees' knowledge in organisations. Previous literature seems to emphasise the importance of rewards and recognition in driving knowledge sharing behaviour. However, there is no effect when compared to collaborative practices as a driver to improve individual and organisation capability in this study. Our results need to be thought of in the context that this is an employee perception study in knowledge intensive organisations.

As a final note we must emphasise the importance of further research to investigate this interesting result. We therefore suggest a much larger sample, not confined to Pakistani knowledge workers, but utilising the employees of other countries. We are cautious about making strong recommendations for HRM practices that encourage knowledge sharing and organisational capability, based on this one study. However, we are encouraged by this finding and believe it is worthy of further investigation by others in the field.

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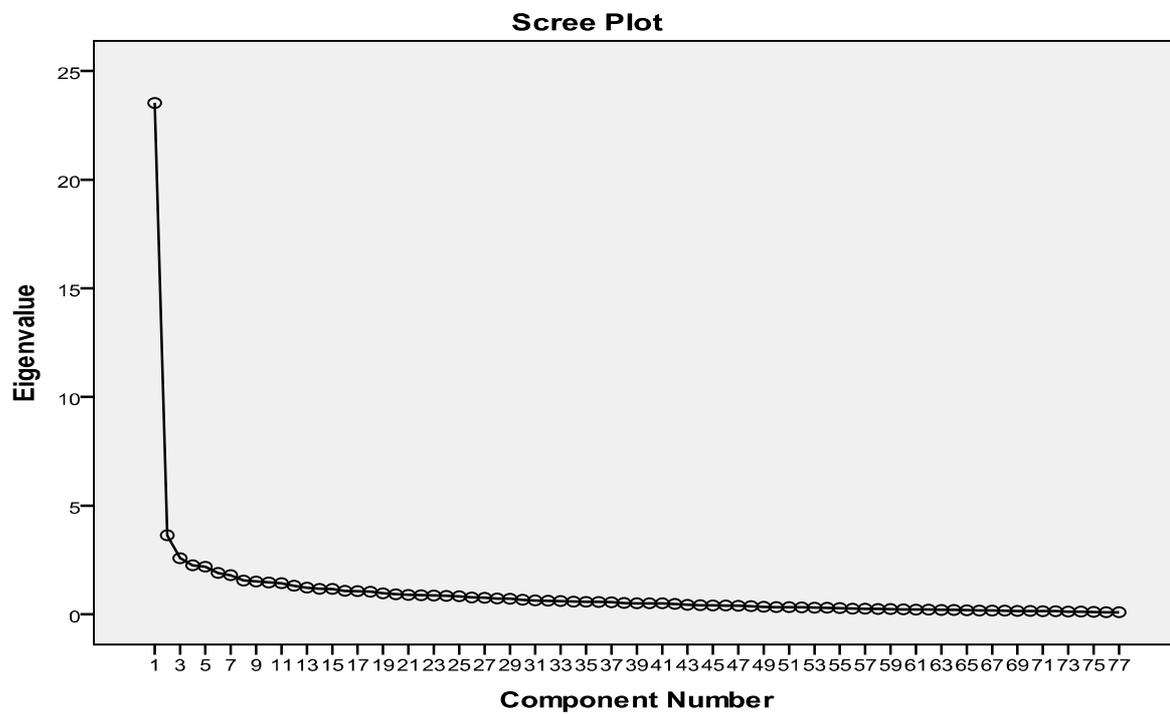
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<u>Appendices</u>

Appendix A

Scree Plot
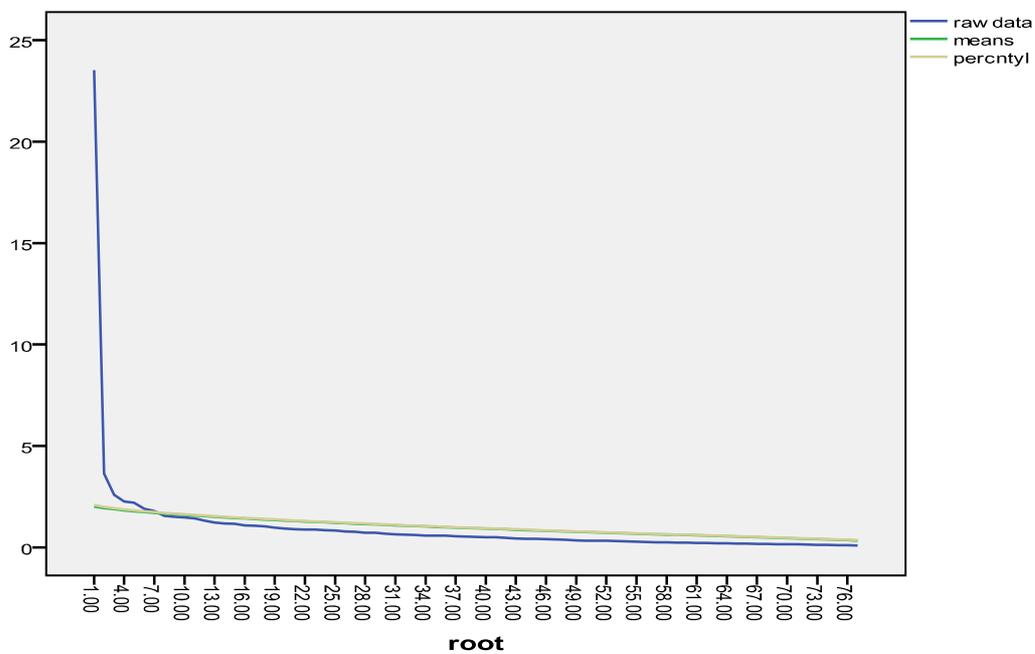
Appendix B

Appendix C

Construct	Psychometric properties	Items adopted from
Recruitment and selection	This data was collected through mail survey and the study is in the context of HRM practices and firm performance, items alpha coefficient value is more than 0.60. It is respondents' perception study in India.	(Kuldeep, 2004).
	In this study, survey was distributed through contact person. The study is in the context of HRM practices, job satisfaction and organisational commitment in New Zealand. It is employees' perception study and the alpha coefficients of adopted items was higher than 0.80.	(Edgar & Geare, 2005).
Employees' Collaboration	This data was collected through mail survey and the study is in the context of HRM practices. The respondents were informants. Alpha coefficient value of adopted items was more than 0.80.	(Lepak & Snell, 2002).
	This data was collected through survey and the study is in the context of collaboration and firm performance. Alpha coefficient value of adopted items was more than 0.60.	(Kuldeep, 2004).
	This data was collected through survey and the study is in the context of intellectual capital, where the respondents were informants. Cronbach's alpha value of the adopted items was higher than 0.80.	(Youndt, 2004).
Rewards and Recognition	This data was collected through survey and the study is in the context of monetary incentives, based on individuals' perceptions. Cronbach's alpha value of the adopted items was higher than 0.70.	(Sweeney & McFarlin, 2005).
	This data was collected through survey and the study is in the context of compensation, based on HR executives as informants of manufacturing firms. Cronbach's alpha value of the adopted items was higher than 0.90.	(Balkin & Gomez-Mejia, 1990).
	This data was collected through survey and the study is in the context of individual reputation and recognition. Cronbach's alpha value of the adopted items was higher than 0.85.	(Davenport & Prusak, 1998).

Knowledge sharing	This data was collected through survey and the study is in the context of knowledge sharing based on individuals' perceptions. Cronbach's alpha value of the adopted items was higher than 0.90.	(Bock, Zmud, Kim, & Lee, 2005).
	This data was collected through survey and the study is in the context of knowledge sharing based on individuals' perceptions. Cronbach's alpha value of the adopted items was higher than 0.90.	(Reychav & Weisberg, 2009).
	This data was collected through survey and the study is in the context of knowledge sharing based on individuals' perceptions. Cronbach's alpha value of the adopted items was higher than 0.80.	(Van den Hooff & Van Weenen, 2004).
Trust	This data was collected through survey and the study is in the context of Trust and organisational commitment based on individuals' perceptions. Cronbach's alpha values of the adopted items were higher than 0.80.	(Cook & Wall, 1980).
Organisational Capability	This data was collected through survey and the study is in the context of knowledge sharing and organisational innovative capability based on individuals' perceptions. Cronbach's alpha value of the adopted items was higher than 0.90.	(Shu-hsien, Wu-Chen, & Chih-Chiang, 2007).
	This data was collected through survey and the study is in the context of intellectual capital based on informants. Cronbach's alpha value of the adopted items was higher than 0.80.	(Youndt, 2004).

Appendix D

Latent construct	Question item(s)
Recruitment and selection	• The recruitment/selection process focuses on selecting the best all round candidates, regardless of the specific job. • The recruitment/selection process places priority on candidate's potential to learn (e.g., aptitude). • The recruitment/selection process uses many different recruiting sources (agencies, universities, etc.). • My organisation always offers trial period for new employees to assess person fit for jobs.
Reward and recognition	• I feel that the monetary rewards given by the organisation to employees for sharing knowledge are fair. • I am satisfied with the monetary rewards that I receive in exchange for the knowledge I give the organisation. • An employees' seniority does NOT enter into pay decisions. • I am satisfied with the non-monetary rewards that I receive in exchange for the knowledge I give to the organisation. • I believe that knowledge sharing among teams can help establish my image as an expert. • I respect others' impression that I am willing to assist people.
Employees' collaboration	• In my organisation employees' always share their experiences with colleagues from other departments. • My organisation supports cross-functional team work for learning through collaboration. • In my organisation employees' always share their experiences in casual meetings.
Trust	• If I got into difficulties at work I know my colleagues would try and help me out. • Most of my colleagues can be relied upon to do as they say they will do. • I feel quite confident that the firm will always try to treat me fairly. • I always trust my colleagues' opinions due to their competence.
Employees' knowledge sharing	• People in my organisation frequently share knowledge based on their experience. • I frequently collect knowledge from other organisational members based on their experience. • I often share with my colleagues the new information I acquire. • I often share with my colleagues the new working skills that I learn. • Sharing knowledge with my colleagues is regarded as something normal in my company.
Organisational capability	• Our organization embeds much of its knowledge and information in structure, and systems. • Our company often develops new products and services well accepted by the market. • A great majority of our company's profits are generated by the new products and services developed.
Individual capability	• The knowledge I receive from my colleagues helps me at work. • I always get valuable feedback from my colleagues, whenever, I share my Knowledge with them. • I always develop novel skills for transforming old products into new ones for market.

Appendix E
Model fit summary-Structural model:

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	46	295.909	90	.000	3.288
Saturated model	136	.000	0		
Independence model	16	1837.058	120	.000	15.309

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.073	.912	.867	.604
Saturated model	.000	1.000		
Independence model	.303	.495	.428	.437

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.839	.785	.882	.840	.880
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.077	.067	.086	.000
Independence model	.192	.184	.200	.000

Appendix F
Model fit summary- Alternative structural model:

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	48	246.766	88	.000	2.804
Saturated model	136	.000	0		
Independence model	16	1837.058	120	.000	15.309

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.066	.926	.886	.599
Saturated model	.000	1.000		
Independence model	.303	.495	.428	.437

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.866	.817	.909	.874	.908
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.068	.058	.078	.002
Independence model	.192	.184	.200	.000