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# Influence of Human Resource on Organizational Innovation: Evidence from Canadian and Russian Enterprises Based in China

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Abstract: The point of view of three different business approaches (Canadian, Chinese and Russian) is discussed in this study. More specifically, this study researched the influence of staff nationality on Human Resource on information technology, examined and compared Canadian and Russian Hi-technology enterprises based in China. After a review of extant literatures in organizational structure and innovation, a list of four dependent variables (including innovation, business intelligence, competitive intelligence and liaison team) was compiled and employed in a questionnaire survey. These grouping variables were analyzed from the perspective of Canadian and Chinese staff from Canadian enterprises based in China and contrasted with Russian and Chinese staff from Russian enterprises based in China. In addition, the grouping variables were split into positions at the organization structure level. Data on 181 Canadian enterprises based in China 246 employees and data on 193 Russian enterprises based in China 247 employees during 2011-2013 confirmed the impact of nationality on innovation. The analysis includes "confirmatory factor analysis" as reliability analysis and Kruskal-Wallis tests (using statistical package for the social sciences software) as one-way analysis of variance by ranks the independent (grouping variables) variables impacted on the depended variables. Overall the results show significant differences in the influence of Canadian staff and Chinese staff from russian enterprises based in China within the four variables in two cases, only a partial effect was identified. It is hoped, the results of the study will help to provide international enterprises guidance in selecting human resource in order to find better solutions to current challenges with innovation in the organization.

**Key words:** Human resource management, Canadian enterprises based in China, Russian enterprises based in China, innovation, business intelligence, competitive intelligence, liaison team

#### INTRODUCTION

In an era of globalization, human resource management of international enterprises needs to incorporate new approaches in managing its innovation and intelligence processes (Chen *et al.*, 2013).

Organizations must aggressively identify 'windows of opportunity' and then institute programs to achieve continuous improvement, creativity and innovation to enhance their competitive position (Babbar and Rai, 1993). Comparing human resource of different countries and innovative issues becomes more and more important as countries recognize the importance of innovation for economic growth (Therrien and Mohnen, 2003). Most studies that search the influence of human resource management on innovation use measures such as

position in organization structure and cross cultural context (Rowley and Warney, 2007; Li, 2013). Bearing this in mind, Hi-tech industrial CEBC and REBC were defined as ideal environment for innovation research. Canadian management is considered to be classical and compressing can be made basing on it (Ananthram and Chan, 2013). Russian management study, which has certain features from the Soviet Union period, is very interesting due to the fact that it has just begun to develop (McCarthy and Puffer, 2013). Chinese management has taken much from different cultures, however, it has its own specific character (Tsui et al., 2006). Comparative management research has traditionally focused on value, attitude and management practice differences that contribute to cultural distance and that seem to affect the work interaction of managers from

different cultures (Kling et al., 2014). Moreover, the Chinese context, as Rowley and Warner (2007) argued that the conceptual formation of HRM in Asia was not a purely 'Western' notion but a mix of both 'Eastern' and 'Western' conceptualizations. While these three categories were different from each other, it was argued that they may share characteristics that distinguish them from people management models outside the region.

Likewise, many influential papers showed strong and statistically significant associations between human resource management practices and innovative performance (Zoghi et al., 2010). Additionally, most of organization researchers (Mintzberg, Vladimirovich et al., 2014) discussed organizational innovation through Business Intelligence (BI), Competitive Intelligence (CI) and Liaison Team (LT). In spite of this, Business Intelligence (BI) continues to be a top priority for many organizations and the promises of BI are rapidly attracting many more proponents (Azma and Mostafapour, 2012). Organizations are grappling to make sense of the rapidly increasing volume velocity and variety of information by both internal and external resources (Isik et al., 2013). However, the competitive intelligence information must be collected and organized as valued organizational information assets (Calof and Dishman, 2007). The existence of business intelligence and competitive intelligence as organizational resource and information depends on conscious management action and decision making of organizational staff (Raymond and St-Pierre, 2010). Vance et al. (2009) underscored, using innovation in the host country, the position of liaison devices is very critical. Damanpour and Wischnevsky (2006) highlights the responsibilities of such integrating roles, which may include troubleshooting, conflict resolution anticipation of problems.

After analyzing the above research, the question addressed in this study was to define whether the nationality of staff and their positions in organization structure impacts innovation. The researching goal is to define the nationality and organization structure positions e.g., CTO, CEO etc., which provide the most impact on innovation (Pedyash *et al.*, 2014).

Bearing this in mind, analysis was undertaken of classical (mintzberg) and recent (Syed *et al.*, 2014; Lasi, 2013) organizational studies focused on the relationship between human resource and organizational innovation, it was focused on the following grouping variables: Canadian and Chinese staff from Canadian enterprises based in China, Russian and Chinese staff from Russian enterprises based in China.

Accordingly, the four following dependent innovation variables that would hold for CEBC and REBC under this study were defined: Innovation (Inn.) (Mintzberg, 1983; Drott, 2001; Hong-Da et al., 2014), Business Intelligence (BI) (Azma and Mostafapour, 2012; Lasi, 2013), Competitive Intelligence (CI) (Blenkhorn and Fleisher, 2005; Calof and Dishman, 2007) and Liaison Team (LT) (Lew and Sinkovics, 2012; Schwartz, 1977; Stefanikova and Masarova, 2014).

#### MATERIALS AND METHODS

The study was conducted in the period from 2011-2013, overall in total 493 respondents from 374 enterprises were interviewed. Specifically, 246 employers from 181 CEBC (authors visited 58 enterprises) and 247 employers from 193 REBC (82 enterprises were visited) participated in the survey and were interviewed. Nearly half of respondents have 300-500 employees. The largest REBCs had 2000 workers. Largest CEBCs had 5000 employees. The top 5 CEBC profile focused on bio-technological manufacturing, pharmaceutical and medical manufacturing, computer, electronic and communication equipment manufacturing, locomotive and railroad cars manufacturing. While the REBC' targets the following industrial sectors: Machinery, motor, vehicle (parts) manufacturing, industrial electronics manufacturing, power, energy and battery, chemical material and product manufacturing and metal (metal construction) manufacturing. Overall, this difference in industrial sector focus seems reasonable, as Canadian industrial is more developed in Hi-technology (Pedyash et al., 2014).

In line with the advice of many social scientists (Oyedele, 2012; Lee *et al.*, 2013) that a Cronbach's alpha coefficient of reliability should be calculated when using Likert scale in a questionnaire, it was imperative for this study to determine the internal consistency of the criteria contained in the questionnaire. The aim is to confirm whether the criteria and their associated likert scale are actually measuring the construct they were intended to measure, which is architects demotivation in this case. Since Cronbach's alpha coefficient is usually between 0 and 1 as a rule of thumb, Chenouri *et al.* (2011) suggest that a value of 0.6 is acceptable, while is 0.8 indicates good internal consistency.

Using the SPSS (Statistical Package for Social Sciences) software tool, the overall Cronbach's alpha coefficient for the four researching items (Innovation, business intelligence, competitive intelligence and liaison team) of this research was 0.771 (in case of CEBC). Table 1 demonstrates SPSS's indicators the above in more detailed.

Table 1: Syntax and reliability for four general items (CEBC)

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Case	No.	(%)		
Case processing summary				
Valid cases	246	99.6		
Excluded <sup>a</sup>	1	0.4		
Total	247	100.0		
Reliability statistics				
Cronbach's alpha	No. of items			
0.771	4			
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\*Listwise deletion based on all variables in the procedure, scale: All variables

Table 2: Syntax and reliability for four general items (REBC)

Case	No.	(%)
Case processing summary		
Valid cases	246	99.6
Excludeda	1	0.4
Total	247	100.0
Reliability statistics		
Cronbach's alpha	No. of items	
0.752	4	

<sup>&</sup>lt;sup>a</sup>Listwise deletion based on all variables in the procedure, scale: All variables

Accordingly, in case of CEBC's the four researching items, Cronbach's alpha coefficient indicates a good reliability and internal consistency of majority of the criteria (Wood, 2008).

Regarding REBC, Cronbach's alpha coefficient is 0.752 (Table 2). It demonstrates a normal reliability (Muenchen, 2011; Lee *et al.*, 2013; Gatignon, 2014).

According to Wu and Tian (2013), in this study the above variables were ordinal but were not normally distributed. Moreover, three or more groups of sample data (three or more separate groups of participants, each of whom gave us a single score on a rating scale) has been compared. Ratings were examples of an ordinal scale of measurement and so the data was not suitable for a parametric test. Unfortunately, this case was used when the assumptions of ANOVA were not met because ANOVA is a statistical data analysis technique that is used when the independent variable groups are more than two (Fitzsimmons, 2013). In ANOVA, it was assumed that distribution of each group should be normally distributed. The non-parametric equivalent to a one-way ANOVA is the Kruskal-Wallis test. Inspite of this, "The Kruskal-Wallis one-way analysis of variance" by ranks the independent (grouping variables in SPSS) variables impacted on the depended variables (rating in SPSS) (Lee et al., 2013). A type of hypothesis used in statistics that proposes which no statistical significance exists in a set of given observations. The null hypothesis attempts to show that no variation exists between variables or that a single variable is no different than zero. It is presumed to be true until statistical evidence nullifies it for an alternative hypothesis (Rodriguez, 2013).

Furthermore, Kruskal-Wallis compares between the medians of two or more samples to determine if the samples have come from different populations (Davidov and Herman, 2010). Measuring the shell thickness of each variable in samples taken from a sheltered, an exposed and an intermediate shore could test this. If the distributions prove not to be normal and/or the variances are different then the Kruskal-Wallis should be used to compare the groups. If a significant difference is found then there is a difference between the highest and lowest median. A non-parametric multiple comparison tests must then be used to ascertain whether the intermediate shore significantly different also is (Verma, 2013; Wu and Tian, 2013).

Thus, according to Oyedele (2012), the null hypothesis is that there are no differences in the mean ranks of criteria as perceived by the respondents between the two groups of firm type. The alternative hypothesis is that the mean ranks are not the same at 95% confidence interval, indicating a significance level of less than 0.05 alternative hypothesis (HA): There are significant differences between the effects of the grouping variables on the "depended variables" and grouping variables impact on "innovation variables" in more detail. Typically, null hypothesis will be not assuming if significance level (asymptotic significance-asymptotic significance) set to 0.05 (p<0.05). The null hypothesis should be retained for the entire criteria since all the values were higher than 0.05 (Chenouri et al., 2011). Moreover, it was used mean rank. According to Wu and Tian (2013), mean reciprocal rank is a statistic measure for evaluating any process that produces a list of possible responses to a sample of queries, ordered by probability of correctness. The reciprocal rank of a query response is the multiplicative inverse of the rank of the first correct answer.

In this study authors combined the data from tables (notes, ranks, test statistics, reports, case processing summary and means etc.) of SPSS analyze (Table 3). The H<sub>0</sub> was: There were no significant differences between the effects of the nationality of staff (grouping variables) (specifically, Canadian, Chinese or Russian staff working in Canadian or Russian enterprises based in China) on the depended variables: The Innovation (Inn.). Business Intelligence (BI), Competitive Intelligence (CI) and Liaison Team (LT). Consequently, defining alternative hypothesis H<sub>A</sub>: There were significant differences between the effects of the staff nationality on these dependent variables. In other words, if Canadian staff from Canadian enterprises based in China has influence on depended variables, if Chinese

Table 3: KWT results

	Canadian		CEBC (Chinese)		Russian		REBC (Chinese)	
Position of	Moon ronly	ZWT (n)	Moon ronk	VUT (n)	Moon rouls	VUT (n)	Moon manls	LULT (n)
organization	Mean rank	KWT (p)	Mean rank	KWT (p)	Mean rank	KWT (p)	Mean rank	KWT (p)
Innovation	100.01	0.024	10001	0.050	100.01	0.055	105.050	0.020
CEO	122.91		129.04		120.81		105.370	
COO	131.05		114.92		60.82		157.960	
Interpreter	119.37		121.53		169.56		51.770	
CTO	129.05		152.16		180.64		102.500	
CIO	136.55		211.03		120.50		215.500	
Engineer	105.08		128.09		155.00		132.200	
BI		0.049		0.039		0.206		0.004
CEO	120.64		126.93		118.58		110.880	
COO	134.18		127.49		159.95		125.490	
Interpreter	117.70		117.18		174.29		133.210	
CTO	131.29		105.21		88.43		97.000	
CIO	111.55		92.87		146.50		97.000	
Engineer	133.14		132.18		146.50		113.300	
CI		0.044		0.466		0.231		0.001
CEO	123.69		129.01		126.90		99.460	
COO	147.39		120.77		151.86		140.930	
Interpreter	118.57		122.44		108.29		110.760	
CTO	103.79		118.79		81.43		197.000	
CIO	135.00		137.81		99.00		148,000	
Engineer	98.64		159.17		197.00		162.910	
LT		0.029		0.285		0.001		0.001
CEO	123.26		124.11		124.49		105.340	
COO	125.89		119.90		122.98		126.120	
Interpreter	123.20		131.73		72.53		108.750	
СТО	103.13		118.55		97.29		189.920	
CIO	156.59		166.03		141.50		176.000	
Engineer	122.94		182.53		209.00		188.520	

staff working in the CEBC has influence on depended variables, if Russian staff from Russian enterprises based in China has influence on depended variables and if Chinese staff from the REBC has influence on the depended variables.

### RESULTS

First of all, Table 3 indicates since asymptotic significance (p) value was greater than the 0.05 criterion of statistical significance, it is concluded that there were significant differences among the groups. Consequently, the H<sub>0</sub> was retained for CEBC' Chinese staff as grouping variables and CI (p = 0.466) and LT (p = 0.285) as depended variables. With regard to REBC, Ho was accepted for REBC' Russian staff as grouping variables and depended variables: Innovation (p = 0.055), BI (p = 0.206) and CI (p = 0.231) (Table 3). Accordingly, in the case of the other variables the H<sub>0</sub> was rejected and it was accepted the HA: The two categorical variables (nationality staff and innovations) are related. This is analyzed in more detail below.

Analyses of the results presented Table 3, it should be stated, nationality in case of Canadian staff influence on innovation, BI, CI and LT. Chinese staff working in the CEBC influence only on innovation and BI. As for Russian staff in REBC, there was influence only in LT. Interestingly Chinese staff from CEBC were most flexible and open to new innovation.

More prominently, Table 3 indicates "mean rank" of staff. This is more clearly shown in Fig. 1. Thus, according to the questionnaire of this study, it was assumed the following. Firstly, regarding the influence of nationality on innovation. SPSS does not inform directly which one is matter but since there is a difference (Verma, 2013). Hence, as it shown at the "group statistics" and to know whether nationality and position used the innovations better or worse, it has to compare the means and since the Canadian staff for CIO (mean rank is 136.55) and Canadian COO (the mean rank is 131.05) were more, they used innovations better. This indicates, Canadian CIO and COO were more open for innovation on enterprises and more often use it than other staff. Chinese staff more used innovations in position of CIO (211.93) and CTO (152.16). According to Ho hypothesis for Russian staff, which suggested that Russian staff are less open to innovation and the data analyzed within this study back up this premise. However the role of CTO does not follow this general trend and the data suggests that Russian nationals within REBC are in fact open to innovation (180.64). Chinese employees from REBC more CIO (215.5) and COO (157.96). Other roles which struggle to effectively implement innovations and change within their organisations are Canadian engineers (105.08) and Chinese CEO (REBC)-105.37.

Secondly, regarding business intelligence, the following statistics indicate Canadian COO (134.18), Chinese interpreters from REBC (133.22), Canadian and

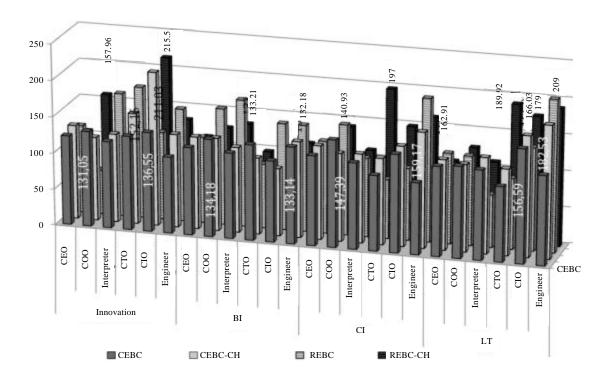


Fig. 1: Comparing the position of organization

Chinese (CEBC) engineers (133.14 and 132.18) used more and opened for BI. Chinese CTO (CEBC) (105.21) CIO (CEBC) (92.87); Chinese (REBC) CTO and CIO (97) had challenges with using the BI as organizational innovation.

By examining Competitive Intelligence (CI), Chinese CTO and Chinese engineers from REBC had the highest mean ranks: 197 and 162.91, respectively. This is expected because technical staff requires intelligence (Rowley and Warner, 2007). The mean rank of Chinese engineers (CEBC) and Canadian COO (CEBC) was 159.17 and 147. 39. The mean rank of Chinese COO from REBC was (140.93). Canadian engineers (98.64) and Chinese CEO (REBC) -99.46 had lowest mean ranks. USLOVNO, Russian COO's mean rank was 151.86, CTO -81.43.

Relative to liaison team, Russian engineers -209.04. Chinese CTO (REBC) -189.92. Chinese engineers (REBC) -188.52; Chinese engineers and CIO (CEBC)-182.53 and 166.03, Canadian CIO-156.59. Chinese CEO (REBC) -105.34. Russian CTO -97.29.

Conventionally, according to Li (2013) as it was predicted, the analyze supports the assumption that CTO, CIO and engineers had the most influence on Innovation. Interestingly, Chinese staff were leaders in these issues. This trend along with the relative strengths and weaknesses of staff influence on innovation are visually depicted in Table 3 and Fig. 1.

# CONCLUSION

The influence of nationality on organizational innovations is visually depicted in Fig. 2. The statistical evidence shows the strongest correlation between innovation with technical staff of Canadian nationality from CEBC such as CIO, CTO and CEO. This can be contrasted Russian CEOs within REBC which are shown to have the lowest innovation. Interestingly Chinese CEO's within REBC are shown to have far higher levels of innovation than their Russian counterparts. Canadian CEOs within CEBC are shown to have higher levels of innovation compared with Chinese CEO's within CEBC. Russian COOs are shown to have the most influence on innovation while the evidence suggests that Chinese COOs have the least impact on innovation.

This indicates that Canadian companies, especially within Hi-tech industries where high levels of innovation are required, are more likely to be successful than Russian companies operating within China. The evidence from the analysis indicates that there are national differences, which have an impact on innovation.

It is important to do further analysis to understand the underlying factors which cause these differences in applying innovation within companies, such as cultural aspects, different political and economic systems, differing national legal systems and so on.

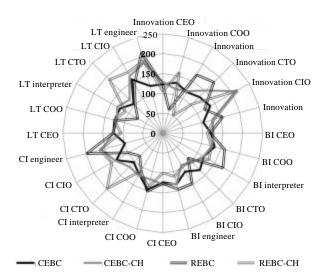


Fig. 2: General comparing nationality position of CEBC and REBC

Consequently, when appointing a CEO and COO, the enterprise must consider all organizational and cultural issues related to a CEO's and COO nationality. There may be organizational and the cultural issues related to his nationality.

The framework presented in this article offers a theoretical and practical basis for understanding how multicultural employees may contribute to their human resource management. Organizational design of enterprises, structured with the consideration from the above finding can help CEBC' and REBC' managers to better attain higher performance for their organizations by adopting a more effective human resource management. It is hoped, the approach of this study will help Chinese, Canadian and Russian managers, who work in China to optimize their organizational structures.

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