Research Paper

The Role of Human Resource Information System on Organizational Performance: Evidence from Bangladeshi Pharmaceutical Industry

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ABSTRACT

Objetive: The study is intended to endeavor the impact of human resource information system (HRIS) on organizational performance (profitability) for selected pharmaceutical firms in Bangladesh.

Methodology: The study adopts four HRIS applications: Job analysis, recruitment & selection, performance appraisal and communication as independent variables and considers profitability as the dependent variable. Data were collected from 464 respondents who are working as the top HR executives in different pharmaceutical firms in Dhaka and Chittagong cities using convenience sampling method. For testing the relationship between independent and dependent variables, Pearson's correlation coefficient technique; and for testing the validity of hypotheses, linear regression analysis has been used.

Results: Results indicate that all the four independent variables have positive and strong relationship with organizational performance supporting most of the previous literatures

Originality/value: The findings of this study are expected to be beneficial for HR departments in adopting and understanding the conductive results of HRIS applications at organizations as well as for academicians to study the impact of HRIS further in this area.

Palavras-chave: Human resource information system; Human resource management; Organization; Performance; Management.

1. Introduction

The optimal effectiveness and efficiency of an organization do not simply depend upon its financial resources or using the best strategy, rather it is determined by the degree to which and how it is utilizing its human capital (Hosain, 2017). To survive in this competitive era, an organizations need to help adapt and evolve its human resource to the highest possible extent and that's why a firm first should try to know how its people are currently performing and if there is any necessity to change (Hosain, 2016). However, over the last two decades, there are notable changes in business and organizations due to rapid technological advancement, globalization, newer political influences on trade,

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introduction of knowledge based economy and fierce competition resulting in rapid changes in HR functions (Park et al., 2004; Azmal & Ali, 2018). HR activities are no more suitable in traditional fashion practiced previously. Information technology (IT) has taken the place of manual functions in HR similar to most of the other departments. Many organizations are investing and learning to utilize IT a strategic tool it is changing the face of HRM in new management era (Jenkins & Lloyd, 1985; Lin, 1997).

Human resources in particular, have been commonly recognized as the key magnitude in creating sustainable competitive advantage for the firms (Colbert, 2004; Laursen & Foss, 2003; Pfeffer, 1998; Subramony et al., 2008). In this regard, IT has a sustainable impact on policies and practices (Stone et al., 2015). As a result, there is growing discussion as to how this inevitable technique and practice can be integrated in all the aspects of an organization which created the magic words Human Resource Information System (HRIS). HRIS can be defined as a method that is used to attain, store, control, recover and distribute relevant information regarding the organization human resources (Thite et al., 2012). The inevitability and application of HRIS are so huge and popular that most of the firms irrespective of size, nature of business, age, ownership and geographical location are trying to adapt and utilize the benefits of it. It is well recognized that proper HR report and related information are purely essential to take the right decision regarding management and organizational strategic policies. Therefore, preparing, storing and maintaining the HR related data are now successfully executed with the help of HRIS.

2. Literature Review

Based on the idea that human resources offer an exclusive source of firm-specific competitive advantage that is difficult or impossible for competitors to imitate (Barney, 1991; Huselid, 1995; Wright & McMahan, 1992), academicians on strategy have paid attention on the issue of developing and utilizing human resources through distinctive HRM practices (Koch et al., 1996; Lau & Ngo, 2004; Wright & Boswell, 2002; Arefin et al., 2018). The basic idea of HRIS was developed in 1960s which is now expanded its influence not only in administrative but also significantly in business and strategic arena (Broderick & Boudreau, 1992; Kossek, et al., 1994; Kovach et al., 2002). Managers, especially at larger geographically spread organizations are facing difficulties to deal with the workforces across various region even countries, cultures, and also political systems. In these circumstances, manual/traditional HR management practices are entirely insufficient (Beckers & Bsat, 2002).

Over the past few decades, organizations have been using HRIS more to manage their talented workforces (Ngai & Wat, 2006). Organizations have started to electronically mechanize many of processes by introducing specific HRIS to cut the usual operation and conventional HR actions and to deal with the complicated transformational ones. HRIS refers to the systems and processes at the crossroads between human resource management and information technology, an incorporated database shared by HR functions that provides a common language and the integration of HR services (Khashman & Khashman, 2016). Therefore; to amplify the effectiveness of HRM, organizations are becoming more and more dependent on HRIS (Ball, 2001; Lippert & Swiercz, 2005). At the operational level, HRIS can keep trail of on the employees, applicants and contingent workers, demographics, performance appraisal, professional development, payroll, recruitment, and retention (Troshani et al., 2011). One of the fundamental changes in this regard can be noted as the modern use of Information System in support of HR process (Hagood & FriedmaHn, 2002). Hence, organizations now a day

are becoming profoundly reliant on HRIS to hoist the value of human resource management (Lippert & Swiercz, 2005; Obeidat, 2012). All organizations these days consider HRIS as a central part of operational and strategic functions. It should be noted that more and more organizations are developing information technology which can help the organization to achieve the goals in a timely manner, which results in organizations make more effective strategic decisions by benefiting from information system (Sadiq et al, 2012).

A few studies have been conducted exploring factors influencing the adoption of the human resource information system (HRIS) in a growing economy, particularly in sectors such as banking (Siegel, 2009; Liu, 2010) and education (Ozen & Kusku, 2009; Hosain, 2016). Alam et al. (2016) performed a survey to identify critical factors influencing the decision of hospitals' management in Bangladesh to adopt HRIS using the Human-Organization-Technology fit (HOT-fit) model and the Technology-Organization-Environment (TOE) framework and found that IT infrastructure, top management support, IT capabilities of staff, perceived cost, and competitive pressure are the main critical factors which have a significant effect on the decision to adopt HRIS (Fobang et al., 2017). In addition to that, they revealed that the technological dimension stood as the major noteworthy aspect.

On the other hand, Mamum & Islam (2016) exposed that management opinion toward HRIS performance fully depended on the experience, gender and education of managers, but was at the same time associated with the organizational origin (Fobang et al., 2017). Bal et al. (2012) somewhat emphasized that performance with the HRIS is influenced by system quality, information quality and alleged ease of use. The fact that HR department staffs require knowledge about HRIS does not undervalue the significance of this technology. Haines and Petit (1997) earlier founded that the presence of a dedicated HRIS unit would increase system usage (Fobang et al., 2017).

Benefits of HRIS as well drew notice to the organizations of Asia. In this case, Bangladesh is not lagging at the rear to exploit the advantages of HRIS. Organizations in Bangladesh are also attempting to adapt HRIS practices in order to derive such benefits. The government of Bangladesh is also expressing its concern in IT sector. Importance on ICT to confirm transparency and good governance in public sector is one of the significant agendas in the last 7th five-year plan1 of Bangladesh (Azmal & Ali, 2018). Organizations of Bangladesh have started IT application in various operations and sectors from the last decades keeping pace with globalization and digitalization. On the other hand, in case of private sector, only the large-scale corporate organizations are using HRIS for last five years. In case of medium and small enterprises, the practice of using HRIS is still limited due to their financial limitations. Financial support is the first obstacle to implement IT (Ngai & Wat, 2006). The purposes of using HRIS in both manufacturing and service-based organizations in Bangladesh are almost same (Bhuiyan & Rahman, 2014).

This study intends to examine the impact of four HRIS application: job analysis, recruitment & selection, performance appraisal and communication on firm performance (profitability).

2.1 Job analysis

Internet based job analysis is one HRIS software that cooperates HR departments to conduct job analysis activities. This is, in general, collecting information from stakeholders using an online questionnaire. The software generates an analytical result

called job description for each job that was surveyed through online questionnaire. Later, these job descriptions are used as the basis of job evaluation (Tesi, 2010).

2.2 Recruitment and selection

Mondy & Mondy (2008) defined recruitment as the process of identifying and attracting potential candidates and selection is the process of making final decisions to select from those candidates through some selection tests (Hosain et al., 2016). The future competency of workforces largely depends upon the best recruitment practices. In addition, with the use of suggested codes of practices to ensure justice and fair dealing for all the applicants, it is expected that the firms comply with legal regal requirements regarding fair employment practices and equal employment opportunities (Mina et al., 2012).

Recruitment application records the details of recruitment & selection such as cost, procedure or method and time to fill each position thus providing the important information timely to the users. (Khashman & Khashman, 2016).

Selection is the process of choosing qualified individuals to fill each position (Mathis & Jackson, 2010). According to Gatewood et al., (2008), HR selection is the process of collecting and evaluating information regarding an individual in order to expand an offer of employment.

For any organization, selection process should be properly designed to identify best competent candidate who best fit the job position. Therefore, whether a person best fit the job to fill in is largely depend upon the proper predesigned selection procedure. On the other hand, all managers responsible for selection try to avoid negligent hiring. According to Mina et al., when best people are hired, productivity increases. HR managers should understand the objectives, policies and practices used in selection to be involved in this important HR function. In this area, HRIS can help managers by providing the necessary information from the previous record and they can make the right decision as far as possible with the help of those information.

2.3 Performance appraisal

Performance appraisal is the process of evaluating the performance of individuals or departments on regular basis in order to improve future performance and to increase potential future career advancement. Performance appraisal concerned with benchmark is a set of specific task to define and evaluate the current performance against pre-established standard. This process requires input and output such as remuneration, pay rise, level of expectation, promotional policy, managerial planning and so on (Abang et al., 2009). According to Rosemond & Ernesticia (2011), employees should be informed exactly what is expected from them, how their performance will be measured and the results will be utilized. Performance need to be assessed on a regular basis highlighting potential identification of training and development needs with the help of formalized and organized format. An effective performance appraisal scheme can form the base for an effective review of financial rewards and career advancement. A well organized, effective and efficient performance appraisal system can provide individual performance data such as due appraisal date, scores, scale of measurement etc.

2.4 Communication

Communication can be defined as the regulatory intra-organizational contacts to coordinate various aspects of organizational functions and changes (Casico, 2006). In this significant function, HRIS involves a vital role to deliver all the necessary information from the stakeholders and vice versa (Mayfield et al., 2003).

2.5 Organizational performance: The point of interest

Organizational performance or firm performance can be referred to cover both financial and operational outcomes in general (Hosain, 2015). Although the conceptual proposal of Venkatraman & Ramanujan (1986) is widely referred to by strategic management scholars (Carton & Hofer, 2006; Richard et al., 2009), the analysis of operationalizations of firm performance used in empirical researches showed a wide variety of approaches covering the domain partially and in an imbalanced method. Combs et al, (2005) analyzed all the articles published in the Strategic Management Journal between 1980 and 2004 identified 238 empirical studies that used 56 different indicators (Santos & Brito, 2012). In most cases, financial performance was used (82%) with accounting related measures of profitability being most common choice (52%). Carton and Hofer (2006) and Richard et al. (2009) depicted a familiar picture. Both studies reported a rate of indicator per article of close to one (Santos & Brito, 2012).

However, this study uses profitability as the performance indicator for the pharmaceutical firms in Bangladesh.

2.6 HRIS and organizational performance

As the information technology was increasing its influence over HRM functions form the inception of 1990s, researchers were being attracted in this matter (Shrivastava & Shaw, 2003). Inauguration and development of IT has changed the face of HR functions in many organizations rapidly. At present, many organizations have come under the services of an human resource information system to support and perform strategic and routine HR functions, promote efficiency, enhance decision making capability, speeding up information dissemination and facilitate changes (Lengnick-Hall & Moritz, 2003). Chugh (2014) noted another advantage of HRIS as the reduction of administrative workload by minimizing the boring, repetitive and routine tasks which can help achieve greater administrative efficiency by adding values to HR departments. Moreover, HRIS helps HR managers to participate in strategic decision making process by being informed with real time relevant information regarding organizations' human talents (Lengnick-Hall & Moritz, 2003).

The advantages of HRIS are not only limited to providing information regarding employment and retention strategies, but also to merge HRIS data into large scale firm strategy (Khashman & Khashman, 2016). The data collected through HRIS provides the firm decision making tools with which exact calculations for decision making such as health care cost per employee, pay benefits as a percentage of operational cost, cost per hire, return on training, turnover rates and costs, average time required to fill each job, return on human capital investment and human value added can be done in advance. However, it should be kept in mind that such results can help making accurate predictions though they do not help directly in reducing cost for HR functions (DeSanctis, 1986).

HRIS can make a large savings for the HR departments by providing more complete real time and current data for the appropriate decision makers. Thus, HRIS is expected to facilitate quality information to management to make informed decisions particularly supporting and summarizing executive reports for top management to understand whether the HR executives are performing their jobs in a more professional manner to gain competitive advantage. HRIS is therefore, a yardstick that helps HR professionals perform their job responsibilities more effectively and efficiently (Broderick & Boudreau, 1992).

Researchers in general reported that efficient HR functions have positive roles in improving total output of organizations, thus applying HR functions effectively and efficiently can increase the financial and operational performance of organizations (Mina et al., 2012). Rosemond & Ernesticia (2011) argued that by developing and implementing an appropriate range of HR policies and practices effectively, an organization can make a substantial performance on itself. HRM will be more effective if it fits the organizational strategy (Khashman & Khashman, 2016).

Sadiq et al. (2012) reported that the HR professionals now have an immense capacity, not only they do possess a large number of readymade information but also store and retrieve that information in a timely and effective manner. Such capacity has increased both effectiveness and efficiency for organizations. HRIS helps organizations by exploiting the limited resources in an efficient manner for more output, adequate quality, in areas of controlling and cost reduction (Hayajneh et al., 2013).

3. Theoretical framework and development of research hypotheses

To investigate the role of HRIS on organizational performance, a conceptual framework has been developed using four independent variables (Job analysis, recruitment & selection, performance appraisal and communication) and dependent variable (Profitability). The variables have been derived from the previous academic literatures on theoretical background and reviews. The conceptual model has been depicted on figure-1.

Figure 1 – Theoretical framework
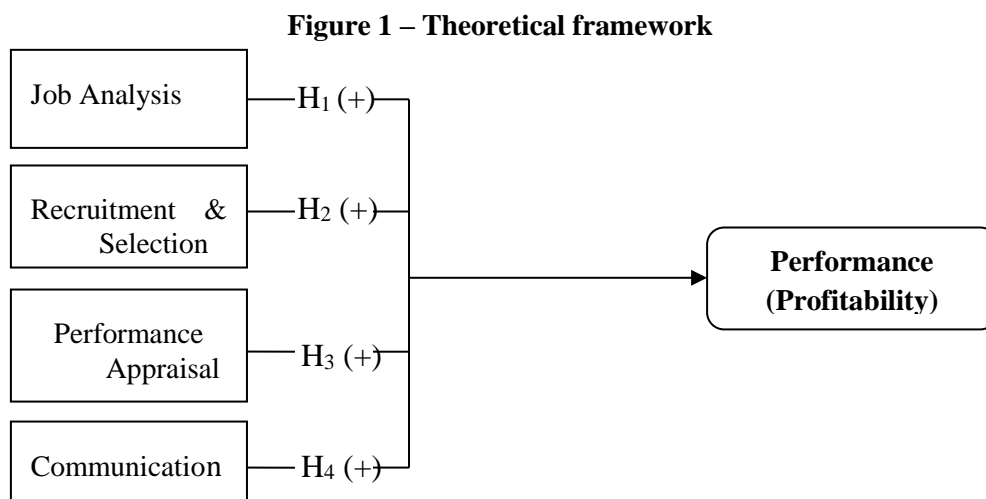
Source: Own elaboration

On the other hand, four research hypotheses have been developed to address the relationship between HRIS and organizational performance. They are:

H1: There is a positive relationship between job analysis and organizational performance.

H2: There is a positive relationship between recruitment & selection and organizational performance.

H3: There is a positive relationship between performance appraisal and organizational performance.

H4: There is a positive relationship between communication and organizational performance.

4. Research Methods

The purpose of this study is to study the role of HRIS on organizational performance. The study is quantitative and deductive in nature. A descriptive analysis has been utilized to describe the characteristics of the respondents. To study the relationship between the variables, partial least square method has been used using structural equation modeling technique. The research hypotheses were presented and tested through multiple regression analysis.

4.1 Collection of data
Primary data have been collected for the study as the secondary information is not suitable to measure in this case i. e. regarding the extent of use of HRIS. A detailed survey questionnaire was used to take the interview of each participant from one organization. The respondents have been chosen using convenience sampling method from two big cities of Bangladesh: Dhaka (the capital) and Chittagong.

4.2 Sample size
The study population included all pharmaceutical firms located in the city of Dhaka and Chittagong. The questionnaire was distributed to 500 top HR executives working at 500 different pharmaceutical firms. Among the questionnaires, 36 questionnaires were found incomplete and faulty. Therefore, those questionnaires have been rejected from the study sample. Therefore, the final sample size stood 464.

4.3 Survey questionnaire

The survey method is the popular and common strategy of business and management research which includes questionnaire and interviews that are created for specific investigation related to the research objectives (Saunders et al., 2009). A questionnaire is a list of questions used to collect factual information beliefs, or attitudes about an issue, a product or service (Bums and Grove, 1993) and the questions that are included in the questionnaire can be open or closed or a combination of both (Pilot and Hungler, 1991).

For this study, there were two different parts on the questionnaire. The first part included demographic information of the employers such as gender, educational level, working area of HR department, length of service etc. The other part included the statements related to the variables of HRIS and organizational performance.

The survey questionnaire included 34 statements (24 for independent variables and 10 for dependent variable). A five point Likert Scale will be used to rank the responses from "Extremely disagree" (1) to "Extremely agree" (5).

4.4 Validity and reliability of the questionnaire

When multiple items are used to measure an individual construct, the item (indicator) convergent validity should be one of the main concerns to the researcher which is the extent to which multiple items to measure the same concept are in agreement (MacKinnon, 2008). According to Hair et al. (1998) convergent validity could be accessed through composite reliability. The results of the measurement model (Table-1) show that the loadings for all items exceeded the recommended value of 0.70 (Hair et al. 1998). Composite reliability (CR) values ranged from 0.86 to 0.95 which exceeded the recommended value of 0.70 (Hair et al. 1998).

On the other hand, in order to analyze the reliability (internal consistency) of the variables, this study used the Cronbach's alpha coefficient and composite reliability (CR) value. Table-1 shows all Cronbach's alpha values are above 0.60 cutoff values as suggested by Nunnally & Berstein (1994).

Table-1: Reliability and validly of the questionnaire

Variables	Composite Reliability	Cronbach's Alpha
Organizational performance (Profitability)	0.924	0.896
Job analysis	0.936	0.914
Recruitment and selection	0.868	0.824
Performance appraisal	0.952	0.944
Communication	0.937	0.916

Note: Composite Reliability> 0.70 (Hair et al. 1998), Cronbach's alpha> 0.60 (Nunnally and Berstein , 1994).

Therefore, the results of reliability and validity indicates that each individual item is internally consistent and a highly degree of reliability.

5. Interpretation of results

The study used descriptive analysis to describe the respondents' characteristics. To test the relationship between the independent variables and dependent variable, Pearson's correlation coefficient has been utilized. Finally, multiple regression analysis has been used to confirm whether the assumed hypotheses are valid or not.

5.1 Demographic characteristics of the respondents

Table-2 represents the demographic features of the respondents who participated in this study, according to the first part of the questionnaire.

Since, this study gave importance to the senior HR executives most in order to know their opinion regarding the influence of HRIS application to firm performance, we can see the large number of aged people with higher working experience in sample.

Table-2: Demographic characteristics of the respondents

Demographic variable	Category	Arithmetic number	Percentage
Gender	Male	272	58.62
	Female	192	41.38
	Total (N)	**464**	**100**
Age	20-29 years	72	15.52
	30-39 years	98	21.12
	40 years and above	294	63.36
	Total (N)	**464**	**100**
Level of education	Postgraduate	460	99.14
	PhD	4	0.86
	Total (N)	**464**	**100**
Working station under HR	Recruitment & selection	159	34.27
	Compensation & benefit	136	29.31
	Promotion	91	19.61
	Performance evaluation	49	10.56
	Leave	29	6.25
	Total (N)	**464**	**100**
Length of experience	Less than 5 years	44	9.48
	6 to 10 years	97	20.90
	11 to 15 years	119	25.65
	16 years and above	204	43.97
	Total (N)	**464**	**100**

5.2 Pearson's correlation coefficient

In Table-3, Pearson correlation coefficient indicates that all the components of HRIS are positively correlated with the dependent variable. But relationship is stronger in case of communication (0.77) followed by performance appraisal (0.61). The result is consistent with study done by Hosain (2017), where it was reported that HRIS and e-communication has the most influential impact on firms' financial performance.

Table-3: Pearson's correlation coefficient for selected independent variables and organizational performance

Independent variables	Organizational performance (Profitability)
Job analysis	0.59
Recruitment and selection	0.54
Performance appraisal	0.61
Communication	0.77

5.3 Results of regression analysis

Based on the objective and hypotheses of the study, the authors applied multiple regression analysis to test the validity of the hypotheses presumed. The results of regression analysis of four independent variables against the dependent variable are depicted on tables-4, 5, 6 and 7:

Table-4: Results of multiple linear regressions to test the impact of job analysis on organizational performance

R Square	Adjusted R Square	F value	Significance
0.626	0.625	26.877	0.000[a]

F-test was used to test main hypotheses as shown in table (4) it was found that calculated F value equals (26.877) and the significance of "F" value is (.000) which is less than ($\alpha \leq$ 0.05) comparing with tabulated F value which equals (2.23) . This provides evidence to accept the first hypotheses: There is a positive relationship between job analysis and organizational performance. R square for the model is (0.626), which means job analysis determine or explain about 62 percent of the organizational performance for the pharmaceutical firms in Bangladesh.

Table-5: Results of multiple linear regressions to test the impact of recruitment & selection on organizational performance

R Square	Adjusted R Square	F value	Significance
0.470	0.435	26.837	0.000a

In case of recruitment & selection, F-test was used to test main hypotheses as shown in table-5, it was found that calculated F value equals (26.837) and the significance of "F" value is (.000) which is less than ($\alpha \leq$ 0.05) comparing with tabulated F value which equals (2.38) . This provides evidence to accept the first hypotheses: There is a positive relationship between job analysis and organizational performance. R square for the model is (0.470), which means job analysis determine or explain about 47 percent of the organizational performance for the pharmaceutical firms in Bangladesh.

Table-6: Results of multiple linear regressions to test the impact of performance appraisal on organizational performance

R Square	Adjusted R Square	F value	Significance
0.580	0.495	25.831	0.000a

Regarding recruitment & selection, F-test was used to test main hypotheses as shown in table-6, it was found that calculated F value equals (25.831) and the significance of "F" value is (.000) which is less than ($\alpha \leq$ 0.05) comparing with tabulated F value which equals (2.29) . This provides evidence to accept the first hypotheses: There is a positive relationship between job analysis and organizational performance. R square for the model is (0.580), which means job analysis determine or explain about 58 percent of the organizational performance for the pharmaceutical firms in Bangladesh.

Table-7: Results of multiple linear regressions to test the impact of communication on organizational performance

R Square	Adjusted R Square	F value	Significance
0.610	0.552	27.901	0.000a

Last of all, regarding communication, F-test was used to test main hypotheses as shown in table -7, it was found that calculated F value equals (27.901) and the significance of "F" value is (.000) which is less than ($\alpha \leq$ 0.05) comparing with tabulated F value which equals (2.37). This provides evidence to accept the first hypotheses: There is a positive

relationship between job analysis and organizational performance. R square for the model is (0.610), which means job analysis determine or explain about 61 percent of the organizational performance for the pharmaceutical firms in Bangladesh.

5.4 Test of hypotheses

From the previous tables, it can be summarized that all the independent variables has got positive F values indicating that all of those variables has positive relationships with the dependent variable, organizational performance. The summarized validity of the hypotheses can be presented on the following table and figure:

Table-8: Test of validity of hypotheses

Hypotheses	Content	Verified or not
H_1	Job analysis and organizational performance are positively (2.23) correlated	Verified & Accepted
H_2	Recruitment & selection and organizational performance are positively (2.38) correlated	Verified & Accepted
H_3	Job analysis and organizational performance are positively (2.29) correlated	Verified & Accepted
H_4	Job analysis and organizational performance are positively (2.37) correlated	Verified & Accepted

Figure-2: Test of validly of hypotheses
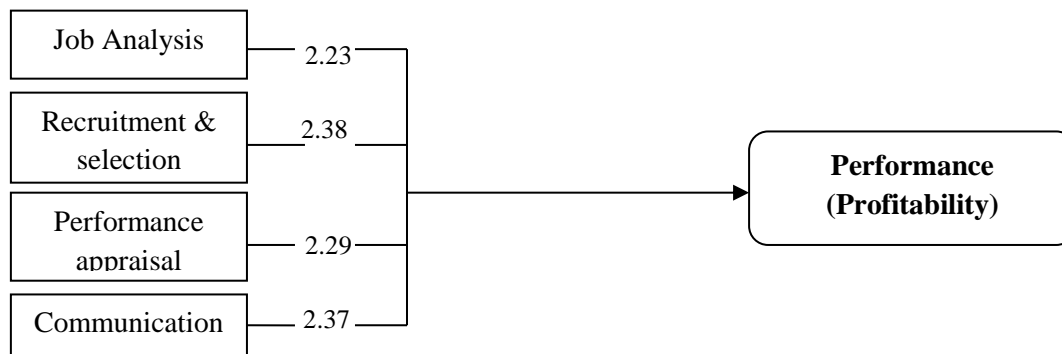
Source: Own elaboration.

The tested results of this are consistent with the previous literatures. The positive attitudes towards HRIS have been reflected by the beliefs of the sample respondents. To encourage improvement in the operations of firms, HRIS should be adopted and implemented because it provides a clear image of operational performance and can be simultaneously used with other computerized applications to increase the performance.

6. Limitations and further scope for research

The study was limited to, the impact of HRIS practices on the organizational performance of only Bangladeshi pharmaceutical firms limiting the scope to one particular culture and particular industry. A cross cultural study or comparative analysis between two or more cultural bases taking considering several industries might have provided different and

wider conclusions. Therefore, there is a gap that could be bridged and opportunity to conduct further analysis on this important area of HRM.

7. Conclusions

As the information has a considerable authority on organizations, there is superior need from the organizational counterpart to take benefits from it. Even though, the researchers are still investigating in this area, most of them are agreed to the point that information cannot be ignored as the part of modern science and technology. Indeed, HRIS has become an unavoidable organ for many organizations. Even though with some limitations, the benefits of utilizing HRIS are enormous. In order to attain better quality of work life, faster and efficient exchange of information and most importantly, to embrace the future organizational needs, HR mangers must find out ways on how to integrate with this gift of science and technology; and make the most of it so that they can achieve strategic competitive advantage through the maximum utilization human resources.

This paper is an effort to construct a further complete framework of the factors which manipulate the organization performance. The highlighted the role of HRIS can influence greatly on achieving organizational performance. But it should also be noted that HRIS can provide only information that are necessary, it is the HR managers or executives who should decide whether to use these information efficiently or not.

This research is expected to contribute to the understanding of the HRIS applications and organization performance in the literature. It describes an integration of HRIS applications and organization performance. Hopefully, these conclusions will drop some light for policy makers and allowing them to amplify concentration to the HRIS applications because of their significance in improving organization performance.

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