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The Impact of Human Resource Information Systems on Organizational Performance

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Abstract:
The present study investigates the effect of human resource information system (HRIS) on organizational performance. The main objective of the study was to examine certain information systems from each of the main HRIS categories. These categories are strategic, which includes information systems supporting workforce planning; operational, which contains performance management information systems; and tactical, including employee training and development systems. A total of 50 questionnaires were collected from employees and managers working in companies from various cities in Saudi Arabia. Regression analysis was applied to analyze the data collected. The findings indicated that the impact of performance management information systems and employee training and development systems on organizational performance was significant. However, information systems supporting workforce planning showed no impact on organizational performance. Future research should consider the impact of different types of HRIS on organizational performance. In addition, it would be interesting to examine the rates of utilization of HRIS in different types of companies and in institutions of higher education. The main contribution of this study arises from the fact that the approach taken differs from that taken in previous research by focusing mainly on specific types of HRIS.

Keywords: Human resource information system, Organizational performance, Employee training and development systems, Information technology, Performance management information systems

1. Introduction

Until recently, human resource management has used computer software and its functions mainly in storing, archiving, and retrieving. However, with the transformation and revolution of information technology and artificial intelligence, organizations are now trying to implement the appropriate software and applications to optimize their processes and achieve their goals and objectives in human resource management functions, by, for example, applying technology in recruitment and selection, compensation, training and development, performance appraisal, human resource planning, talent management, and career development. [1] have emphasized that the development and innovation of technology has made it necessary for human resources management to adopt suitable information technology in order to utilize its functions. [2] has stressed that the rapid improvement of the business environment encourages organizations to implement the appropriate technological tools to support human resource managers to obtain reports and make decisions quickly. In addition, [3] has emphasized the necessity to the organization of using information technology for human resource management activities. [4] advances the notion of using technology as tool to help organizations to function effectively and proficiently and to gain a maintainable competitive advantage.

A human resource information system (HRIS) is one of most important programs that can help the human resources department and the organization as a whole to operate effectively and efficiently. According to [5], an HRIS can be defined as an incorporated system that helps the organization to store, retain, collect, and analyze information regarding its workforce. [1] explain that characteristic activities of human resources, including collecting and sustaining information and generating reports about the employees in an organization, can be done through an HRIS. [6] highlights the benefits of HRISs, as they help to generate sophisticated reports, ensure consistent information, and lessen the time spent on administrative duties. Moreover, [3] demonstrates the benefits that employees and organizations can gain by using HRISs, which include cost-lessening, efficient decision-making, the ability to build databases of employees in the organization, reduction in paper forms and time savings, helping employees and managers to make appropriate decision in a timely manner, computerization of routine tasks, and accessibility of information. The components of an HRIS are input, data maintenance, and output. According to [3], the input element contains personal information and essential data; data maintenance deals with updating current information and adding new data after initially entering data into the HRIS; and the final component, output, includes reports and information that help the human resource department and the organization.[7] recognizes three factors that encourage organizations to adopt HRISs in their processes and procedures: the fact that the human resource management role is changing in the business setting, the fact that the affiliation between managers and employees is changing, and the goal to make human resource functions operate effectively. In addition, [8] attest that for an organization to perform well, the human resources management functions must be linked with organizational strategies, and there should be a shift from traditional human resources management to systematic human

resources. [9] has indicated, further, that for an organization to be successful it must consider workers as an asset in which to invest. [10] declare that one cause of information technology not affecting organizational performance is negligence in investing in human resources. Moreover, [11] agree with [10], affirming that information technology can be used to measure organizational performance by assessing workers' performance, involvement, satisfaction, and developing human resources. [12] adds that high performance can be achieved by sustaining, inspiring, and encouraging workers and considering human resources as an asset that will bring a competitive advantage to the organization. Furthermore, [13] stress that for an organization to build strength and gain competitive advantage, it should consider implementing an HRIS.

1.1. Objectives of the Study

The objectives of this study are:
- To investigate the impact of information systems supporting workforce planning on organizational performance.
- To examine the influence of an employee training and development systems on organizational performance.
- To investigate the impact of a performance management information systems on organizational performance>
- To provide recommendations and suggestions that will enhance organizational performance by using HRIS applications.

1.2. Types of HRIS

According to [14], there are three types of HRIS:
- Strategic HRIS are concerned with organizational and human resource strategic planning and include: Information Systems Supporting Labor Negotiations (ISSLN), which help with negotiations with various stakeholders such as government, unions, and maintenance. Information Systems Supporting Workforce Planning (ISSWP), which support the organization's strategic planning, adding new products, and analysis of the workforce of the firm.
- Tactical HRIS support managers with decisions regarding essential functions of human resource management and include: Recruiting Information Systems (RIS), which assist with recruitment procedures for the organization, including lists of occupied and unoccupied positions, employee retirements and relocations, requirements of positions, and skills and preferences of workers. Employee Training and Development Systems (ETDS), which manage lists of employees who need training, skills inventory, and requirements of positions. Job Analysis and Design Information Systems (JADIS), which assist with completing job descriptions and specifications based on information from workers, interviews, managers, and external resources. Compensations and Benefits Information Systems (CBIS), which aid with employee incentives and benefits and support a variety of tactical human resource choices.
- Operational HRIS deal with the day-to-day routine and more tedious human resource management functions. Operational HRIS include: Employee Information Systems (EIS), which contain employee skills inventories and employee information, such as years of experience, income, education, diplomas, and so on. Performance Management Information Systems (PMIS), which deal with employee appraisal and productivity. Managers can use these systems to make decisions regarding relocating, retaining, firing, and promoting. Position Control Systems (PSC), which manage information about positions, such as job title and category. Application Selection and Placement Information Systems (ASPIS), which help in running the recruitment and selection functions, include screening, archiving, examining, and evaluating candidates.

1.3. Hypotheses of the Study

The study supposes the following hypotheses:
- H1: Information systems supporting workforce planning impact organizational performance.
- H2: Employee training and development systems impact organizational performance.
- H3: Performance management information systems impact organizational performance.

1.4. Model of the Study

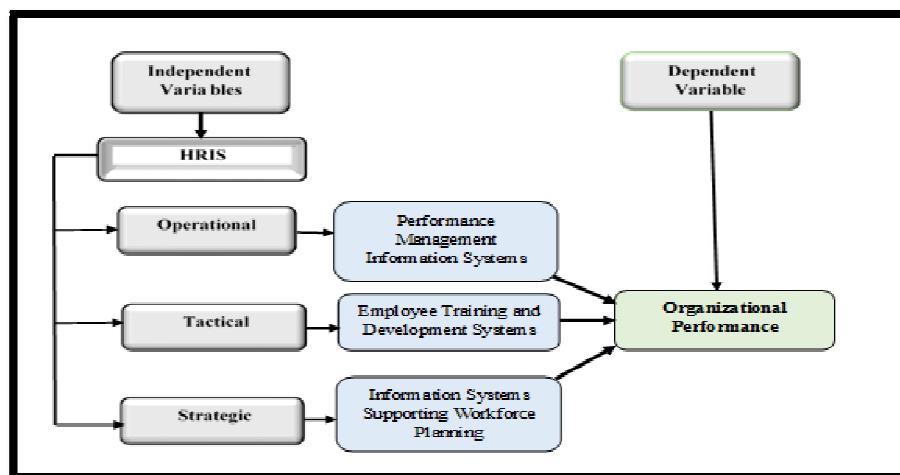Figure 1 presents the proposed model of the study:

Figure 1: Model of the Study

The study is organized as follows. The next section highlights studies about HRIS. The third section outlines the methodology. Results are presented in the fourth section. The fifth section presents the discussion. The sixth section concludes the study, and, finally, limitations are discussed and suggestions for future research are offered in the seventh section.

2. Literature Review

A review of the literature reveals that existing studies focus on explaining the use of information technology in organizations and how information technology can be used in human resources [15], [16], [17], [18]. However, the subject of HRIS and their impact on organizational performance has received minimal attention. This section reviews the literature to summarize the studies that have been done on HRIS.

A recent study by [19] investigates the role of human resource management in the digital transformation. A qualitative method was adopted, and semi-structured interviews were conducted with five human resources professionals in the United Arab Emirates. The main finding was that the use of HRIS in routine practices and procedures was effective; however, there was less contribution of human resources to digitalization strategies.

A study by [20] examines the organizational factors that influence HRIS in the Central Bank of Iran. The factors considered in the study were strategy formulation, objectives, resources, structural principles, technology, human resources, and organizational technology. Data were collected from 170 questionnaires. The main finding of the study was that technology and resources have an impact on HRIS; on the other hand, strategy formulation, objectives, organizational management, providing human resources, structural principles, and organizational culture showed no influence on HRISs in the bank.

[21] explores the subject of human resource management systems by addressing the reasons for using HRIS and its capabilities. The paper explains how HRIS can be used by computers in areas such as databases, data processing, information security, internet, and integrated systems. In addition, it identifies the uses of HRIS in recruitment, planning, worker evaluation, compensation, and training. It also discusses the obstacles to implement HRISs and provides recommendations for optimizing their use.

The main purpose of the article by [22] is to inspect the influence of management information systems (MIS) on human resource management in terms of job performance at housing and utilities companies in Libya. In addition, the study considers the direct and indirect influence of MIS. The data from 304 returned questionnaires were analyzed, and the most important finding was that there was a direct influence of MIS on human resource management.

[23] conducted an exploratory study to examine the impact of HRIS on organizations' competitive advantage. The study used a questionnaire to collect data from Saudi public companies, and 102 questionnaires were obtained. The results of the study indicate that there was a statistical association between implementing HRIS infrastructure and the ability to achieve a competitive advantage.

An article by [24] examines the attitudes of experts working in human resources about the effect of HRIS in human resource management strategy. Based on data from a questionnaire, the study findings indicate that experts working in human resources emphasized the importance of HRIS in assisting the strategic responsibilities for human resource management.

Astudy by [25] investigates the efficiency of an HRIS in the ministries of the Palestinian National Authority in the Gaza Strip. Based on data from 44 questionnaires, the findings reveal that using an HRIS in the ministries helped in providing precise and accurate information about employees by up to 95%. In addition, however, the competence of the HRIS was compromised by a lack of technical and administrative support.

It is noted that most of these studies have emphasized the introduction of an HRIS, its uses in the organization, and perceptions of it. Few studies have investigated the different types of HRIS in terms of the operational, tactical, and strategic perspective and their impact on organizational performance. [26] conclude that the effectiveness and impact of HRIS in the organization are still under investigation. [27] add that studies on the effectiveness of information technology and its relation to firm performance are inadequate. The contribution of this study arises based on the clarification above and the fact that this study examines the impact of different types of HRIS, which include operational (performance management information systems); tactical (employee training and development systems) and strategic (information systems supporting workforce planning) on organizational performance.

3. Methodology

3.1. Sample and Data Collection

The purpose of this study is to examine the impact of certain types of HRIS, including strategic (information systems supporting workforce planning), operational (performance management information systems), and tactical (employee training and development systems) on organizational performance. The study uses primary data to investigate the effect of HRIS on organizational performance. The sample consisted of 50 participants working in different companies in Saudi Arabia. The primary data were collected using a questionnaire. The questionnaire was designed after reviewing the literature about HRIS and organizational performance. The questionnaire was divided into two sections: the first section focused on the demographics of the participants and the second on the variables to be studied. The questionnaire contained 25 questions in total; 20 questions used a five-point Likert scale (Strongly Agree–5 to Strongly Disagree–1). A cover letter was included with the questionnaire explaining the purpose of the study and the variables under investigation. Data were analyzed using regression in SPSS program.

3.2. Operational Definitions

The operational definitions of the variables in the study were adopted after reviewing the literature as shown in Table 1:

Items	Variables	Operational Definition
1	Gender	Male or Female
2	Age	Under 18; 18–29; 30–44; 45–60
3	Place of work	Jeddah; other
4	Position	Employee; manager; head of department
5	Working in HRM department	Yes; other
6	Strategic- Information systems supporting workforce planning (ISSWP)	Uses of ISSWP to plan the workforce; uses of ISSWs to identify jobs; uses of ISSWP to determine the level of human resources and differences in skills and jobs; uses of ISSWP to predict job needs; uses of ISSWP to replace retired employees
7	Tactical- Employee training and development systems (ETDS)	Uses of ETDS to determine the training needs of workers; uses of ETDS to select eligible workers for training based on their skills needs and performance; ETDS help reduce the costs of training programs for workers in the company; using ETDS to provide training programs electronically; uses of ETDS to define criteria for the feasibility of training programs and measure their effectiveness
8	Operational- Performance management information systems (PMIS)	Uses of PMIS to evaluate workers' performance; uses of PMIS to manage workers performance and generate performance reports; uses of PMIS to manage workers' performance in terms of assisting managers in making decisions regarding promotion, salary increases, or contract termination.
9	Organizational performance	The company has policies that encourage individuals to present creative ideas to improve the performance of the organization; the company's policies and procedures assist workers in completing their work effectively and efficiently; the company in which I work has clear policies aimed at satisfying customers and providing services to them with high quality; the company chooses workers with competencies, expertise, and skills that help in achieving the company's strategic goals; the workers perform their work according to the quality standards set by the company; the company selects the appropriate strategies to achieve its goals and improve workers' productivity; the company sets specific key performance indicators to ensure that its goals and strategies are achieved.

Table 1: Variables Operational Definition

4. Results

4.1. Descriptive Statistics

The descriptive statistics shown in Table 2 present the demographic characteristics of the respondents. Of the participants in our sample, 64% were male, while 36% were female, a difference which might reflect the different percentages of males and females in the workforce. Most of the respondents (52%) were between 30 and 44 years of age; those aged between 19 and 29 years formed (42%); there was one respondent aged less than 18, which amounts to (2%), and the remaining respondents (4%) were aged 45–60. It can be noted that (46%) were employees; (18%) were managers and (36%) were heads of department. In addition, most of the respondents (58%) worked in human resource management departments. Thus, most of the respondents have experience in human resource management functions, procedures, and regulations. The remaining (42%) worked in different departments. Finally, (54%) of the respondents worked in the city of Jeddah; the rest were in other cities in Saudi Arabia.

Demographic Variables	Frequency	Percentage
Gender		
Male	32	64
Female	18	36
Age		
Less than 18	1	2
19–29	21	42
30–44	26	52
45–60	2	4
Position		
Employee	23	46
Manager	9	18
Head of department	18	36
Department		
Human Resource Management	29	58
Others	21	42
Place of work		
Jeddah	27	54
Out of Jeddah	23	46

Table 2: Demographic Characteristics of Respondents

4.2. Reliability Test

Table 3 shows the Cronbach alpha to test the reliability of the variables. According to [28], a Cronbach alpha of 0.70 is acceptable; 0.80 or greater is preferred. Table 3 shows that the performance management information systems is above 0.70 and the remaining variables are all above 0.80, which makes them acceptable to use for analysis.

Variables	Cronbach's Alpha
1. Information systems supporting workforce planning	0.832
2. Employee training and development systems	0.885
3. Performance management information systems	0.769
4. Organizational performance	0.846

Table 3: Cronbach's Alpha for Reliability

4.3. Collinearity Test

According to [29], variance inflation factor (VIF) is one of the most trusted tools with which to test multicollinearity because it indicates which of the variables is causing the collinearity problem. The collinearity or multicollinearity occurs when one independent variable has a strong correlation or linear combination with another independent variable [30]. A VIF that is less than or equal to 4 indicates no issues with multicollinearity in the model; a value of 5 could be acceptable; however, anything above 5 indicates that the multicollinearity needs to be examined. Table 4 shows that there is no problem with collinearity.

Independent Variables	VIF
1. Information systems supporting workforce planning	4.381
2. Employee training and development systems	2.865
3. Performance management information systems	1.768

Table 4: Collinearity Test

4.4. Regression Analysis

Regression analysis was applied to investigate the impact of the HRIS on organizational performance. As shown in Table 5, the Fisher result is equal to 29.631 and significant, which indicates that the regression model fits the data and the independent variables improve the model fit. The R-squared, which measures the association between the model and the dependent variable, is equal to.659. In addition, it shows that 65% of variance in the dependent variable is explained by the independent variables. For the Durbin-Watson to be significant, it must be less than 2 [31]. As shown in Table 5, the Durbin-Watson is 1.756, which means statistically significant. When it comes to testing the hypotheses, Table 5 shows that the performance management information systems and the employee training and development systems were statistically significant at $p < 1\%$, which means that hypothesis 2 and 3 are accepted: there is indeed an impact of those two systems on the organizational performance. However, the information systems supporting workforce planning was insignificant at $p < 1\%$, which means that there is no impact on the organizational performance. Therefore, hypothesis 1 is not accepted.

Dependent Variable	Organizational Performance
Independent Variables	
Constant	-1.567E-16 (0.000)
1. Information systems supporting workforce planning	0.219 [a] (1.775)
2. Employee training and development systems	0.380 ** (2.738)
3. Performance management information systems	0.330 ** (0.000)
R^2 Fisher Durbin-Watson	0.659 29.631 ** 1.756

Table 5: Regression Analysis
** p < 1%; * p < 5%; a: p < 10%

5. Discussion

The purpose of this study is to examine the impact of certain types of HRIS, including information systems supporting workforce planning, employee training and development systems, and performance management information systems on organizational performance. The findings reveal that information systems supporting workforce planning have no impact on organizational performance. This result indicates that companies might use different HRIS, such as recruitment information systems, to predict workforce supply and demand. In addition, it gives an indication that the upper administration in the company might prefer traditional methods of predicting and analyzing the workforce. On the other hand, employee training and development systems and performance management information systems made a significant impact on organizational performance. This finding concurs with a study by [32] that stresses that an organization can achieve a competitive advantage by applying human resource practices. In addition, [33] agrees with [32] in asserting that in order for human resource management administrative and analytical functions to perform well, an HRIS should be implemented. Moreover, [34] confirms that the use of an HRIS in a continuously changing organizational environment can improve human resource functions like training and development, and performance appraisal. With the increasing importance of technology, artificial intelligence, employee experiences, and employee engagement, the importance of the HRIS and its different types is becoming more obvious. In term of training and development, using an HRIS helps in assessing each employee's skills and competence and keeping records and tracking processes. In performance management, the need for information systems that help managers to make the right decisions, conduct evaluations, and present performance appraisals electronically should help to improve organizational performance. An HRIS for training and performance management should assist the organization in its strategy and performance by linking the systems with organizational strategic planning.

6. Conclusion

The primary concern of this research was to investigate the impact of certain type of HRIS, specifically information systems supporting workforce planning, employee training and development systems, and performance management information systems, on organizational performance. Using a questionnaire to collect data from companies in Saudi Arabia and regression analysis to analyze the data, the results of testing the hypotheses were as follows: there was a statistically significant impact of employee training and development systems and performance management information systems on organizational performance. This finding indicates that organizations are transforming traditional human resources functions to become more computerized to gain competitive advantage. In contrast, information systems supporting workforce planning had an insignificant influence on organizational performance. This result might be because organizations are using recruitment information systems to plan and predict the workforce. In addition, organizations are adapting electronic recruitment, which could give human resource managers and specialists more insight into the types of employees the market demands. One of the implications of this study is that employee training and development systems can be used by organization to systematically organized training sessions and courses according to the employees' training

needs, generate skills inventory, and design electronic training programs that are aligned with the organization strategies plans. [35] emphasized the importance of providing a well-organized training programs and environment that should increase employee's loyalty and help the organization gain a competitive advantage. Another implication is that the findings of this study shows that using performance management information systems can impact organizational performance which means that organizations should utilize the performance management information systems and make it driven by the organization objectives and strategies.

7. Limitations and Future Research

This study has several limitations. The first limitation is the small sample used; the overall results might be different if the sample size was larger. Thus, similar research with a larger sample size could be undertaken. The second limitation stems from selecting only certain HRIS types; a study could be conducted using more than three types of HRIS. The third limitation relates to the tool used to collect data, which was a questionnaire. The questionnaire may not have allowed respondents to answer the questions precisely. Thus, a study that uses quantitative and qualitative methods to assess the impact of HRIS on organizational performance would be worth undertaking. In addition, a future study could be done on specific organizations in Saudi Arabia that are currently using HRIS to investigate the different impacts of each of the HRIS types, including strategic, tactical, and operational.

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