

The Effect of Human Resource Information Systems on Innovation –Study at Jordanian Telecommunication Companies

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Abstract

Telecommunication companies is a very important sector in today's economy. They contribute heavily to the national economy of developed and developing countries. They are considered a motive for all sectors in any country. Therefore, human resources should be managed well and the consolidated human resources information systems are very important in this pursuit. They need support from top management at the telecommunications companies. As such, this study aimed to know the effect of human resources information systems on innovation from the employees' point of view at the Jordanian telecommunications companies. To achieve this, (384) questionnaires were distributed to the sample at Jordanian telecommunications companies, with (336) valid questionnaires were recovered. The study concluded with some results, most importantly are the level of human resources information systems, which scored high, in addition to innovation, which scored high as well. There is a significant statistical effect of human resources information systems and all its components on innovation at ($\alpha \leq 0.05$) at Jordanian Telecommunications companies, and interpreted (0.60) variance for innovation, except for selection and recruitment information systems which had no effect. The researcher recommended that the telecommunications companies adopt human resources information systems as a strategy to maximize benefits gained from the strategy of their use. In addition, the researcher recommended that the telecommunication companies increase the level of relying on human resources information systems to get information about employees, competencies, and human resources as a whole, which benefit in planning, training, compensation and so on to get benefits for their companies.

Keywords: Human Resource Information Systems, Innovation, Telecommunications companies, Jordan

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1. Introduction

Digital technology and information systems are affecting most areas of industry. It is evident that they have an effect on the practices of human resources as well. In itself, the digital revolution simply means the transfer, implementation and use of technologies and basic knowledge of new information technology at work, which also affects human resources. (Malkawi & Halasa, 2016) (Kumar, b, 2016) (Malkawi, 2017). To develop human resources, information technology systems must be utilized in the right way. Since the digital revolution has an important role to play presently, it is bound to have effects on the performance and quality of human resources. Recently, technology has been having a significant effect on the processes and practices of resource management. This led to the emergence of a new field of knowledge (Malkawi, 2016), which is human resources information systems (HRIS). This new field focuses on the use of technology to support the functions of human resources. It can be defined as a system used to obtain, store, process, analyze, retrieve, and distribute information related to the human resources of an organization to support human resource management and administrative decisions (Malkawi, 2018a). (Kavanagh et al., 2015). Some researchers have also called this new field electronic human resource management (Lengnick-Hall & Moritz, 2003; Gueutal & Stone, 2005). It started as a simple mainframe system for payroll automation and is now integrated into all areas of human resource management, including selection, recruitment, training, and compensation (Stone, Deadrick, Lukaszewski, & Johnson, 2015) (Alraja & malkawi., 2015).

These systems have greatly improved many of the sub-functions of human resource management (HRM) and enabled the field to enhance efficiency, reduce administrative burdens, and provide improved service to employees, retirees and job applicants. Furthermore, the advent of the Internet and new cloud-based technologies helped human resource management to achieve the critical goals of attracting talented applicants, streamline selection operations, facilitate the use of self-service technologies, and allow the institutions to deliver distant training (Malkawi et.al., 2021) (Kavanagh et al., 2015).

Successful human resources information systems remain a prerequisite for the success and excellence of today's organizations, and an important pillar for their good management that is characterized by efficiency, distinction and competence. They are a source for strengthening their competitiveness by seizing new opportunities that enable them to obtain market shares and become promising local and international sale outlets. The organizations are now looking for creative employees and developing their capabilities and skills, to address urgent problems and issues. This necessitated the activation and employment of the creative approach to reduce

forecasting, guesswork and coincidence, under conditions of uncertainty, and at a time when organizations are competing for a promising market share (Abdul Sattar, 2002). Moreover, many modern organizations have employed human resources information systems through their human resources planning information systems, selection and recruitment, training and development, performance evaluation and compensation information systems for achieving professional and administrative excellence and innovation. The use of technology allows organizations to imitate others' products and services, leading to downsizing the lifecycle of their competitive advantages (Wheelen and Hunger, 2012) (Al-Khasawneh et. Al., 2018). This also has obliged organizations to invest in human resources. Troshani et al. (2011) who confirmed that organizational success in today's knowledge economy significantly affects the performance of human resources supported this. Snell et al. (2001) have also discussed the increasing importance of human resources in organizations. They said that a new era has begun in the development of the role of human resources from a production worker to valuable and unique resources. Rodríguez and Ventura (2003) added that the role of human resources information systems has also shifted towards a significant contribution to the management strategy of the organization. This shift has been attributed to human resources technology (Troshani et al. 2011). Today, innovation is considered an essential and supportive element of any organization, and it is considered one of the most recent and developed themes, as innovation and development have become the focus of administrative innovation for any administrative organization. Because organizations live in changing and dynamic conditions that make them in dire need of innovation. This entails that the managers must be keen on developing the capabilities of workers to contribute and participate in the generation of new ideas and work in the spirit of one distinguished and serious team to solve problems and make the right decisions, to reach innovation and increase production (Borins, S., 1998).

2. Significance of research

2.1. Scientific importance

The importance of this research emanates from the high value that result from the application of human resources information systems in organizations and the achievement and development of administrative innovation, in light of the great accumulation of knowledge, which contributes to achieving the goals of the organizations. The importance of this study also stems from the fact that most of the Arab studies that examined the issue of the effect of management information systems on the innovation of companies, in general, are very few, especially in the Jordanian work environment. However, few of them discussed the relationship between the characteristics of human resources information systems and innovation, especially in the telecommunications environment in Jordan. This study gained its importance from its discussion of one of the important themes at present (human resources information systems), and their effect on the telecommunications sector in Jordan.

2.2. Practical importance

This research presents statistical results that explain the role of management information systems in achieving administrative innovation in organizations, especially telecommunications companies. This is particularly where information and communication are considered among the most important matters that facilitate communication and social networking. This also applies to communication in the government and private organizations and facilitates decision-making and task performance. In addition, the research provides suggestions and recommendations that help telecommunication companies realize and develop administrative innovation.

3. Problem of research

Organizations are living now in a continuously changing environment, therefore organizations' possession of the components, components and elements of information systems increases their distinction, innovation and realization of their vision, mission, goals and objectives that they strive to achieve. Therefore, the problem of this study comes from studying the effect of human resource information systems on innovation at Jordanian Telecommunication Companies. So research on this topic and explore human resource information systems and their effect on innovation is an important issue for Jordanian Telecommunications companies to sustain and achieve competitive advantage. Therefore, the problem of the study is represented in answering the question:

What is the effect of human resources information systems on innovation at Jordanian Telecommunication Companies?

4. Theoretical Framework

4.1. Human resources information systems

Most of today's HR interfaces and portals have become an electronic portal rather than a person or office so that almost all companies now provide comprehensive access to HR services through technology and human resources information systems and web-based applications. This trend has led to a major change in the practice of human resource management. This shift in the delivery of human resources services has been known as

“electronic human resources.” The implementation of electronic human resources requires a fundamental change in the way in which human resources professionals view their roles. So. The need to reduce costs and expand or improve services often results in such changes (Johnson, and Gueutal, 2011).

Recent work has shown that organizations that successfully adopt advanced HR technology tools outperform those that do not. However, since most organizations already have basic automated HR management, the simple automation of HR processes can no longer guarantee a competitive advantage. Instead, organizations should determine how to use modern technology to transform HR practices and market their HR brands faster and more meaningfully (Johnson and Gueutal, 2011). It can be said that the human resources information system (HRIS) is the link between human resources management (HRM) activities and information technology. The human resources information system is the integration of software, hardware, support functions, system policies, and procedures into an automated process formulated to harness the strategic and operational activities of the human resources department and managers in the organization (Kovach & Cathcart, 1999). The main function of the human resource information system is to collect, facilitate and analyze the data necessary for the human resources management to do its work in a correct manner (Kelly O Weeks, 2013). The human resources information system (HRIS) synergistically combines two important types of organization's resources, namely human and information sides. The studies have confirmed that organizations that have adopted HRIS are small and usually deal with tactics and management rather than with strategy. Tactical HR applications usually refer to transaction processing for managing payroll and benefits. However, strategic applications make organizations more effective and competitive, especially in the area of knowledge management and workforce planning (Ramayah, Dahlan, Teck, Aafaqi, 2003)

The human resources information system contributes significantly to the functional development of various human resources. This is attributed to the use of a shared database for all individual units related to human resources such as payroll, benefits management and pensions. This prevents work duplication and different work processes become more efficient. Furthermore, it is believed that the human resources information system can support various human resources practices such as work force planning, recruitment, compensation, salary forecast, and employee relations (BAL et al., 2012).

The idea behind using the human resources information system use is that it will allow the human resources function to become more efficient, and to provide better information for decision-making. So, the use of human resources information systems has been advocated as an opportunity for HR professionals to become strategic partners with the senior management (Lengnick-Hall and Moritz, 2003). In its simplest, the human resources information system is used to obtain, store, process, analyze, retrieve, and distribute information related to the human resources of an organization. It is often seen as a service provided to an organization through information. However, there is hope that the more prevalent the use of these systems is, there will be higher-level forms of human resources information system (Tannenbaum, 1990).

4.1.2. Components of Human Resources Information System.

They are a group of elements and parts that combine and complement each other functionally to achieve a specific goal. The system consists of three components: inputs, processes, and outputs (Sokro, 2012).

These components include four elements (Salima Abdullah et al., 2017):

4.1.2.1. Human resources: This element includes working individuals with different specializations, qualifications and levels, as they are the main resource for operating and controlling other components. This part is considered one of the most important elements of the system as it analyzes information, develops programs and manages information systems.

4.1.2.2. Physical materials: This element includes the various types of physical components and means used in the processes through which data and information go through. The hardware or systems do not include computers and devices only, but they also include all tangible means for recording data, including pieces of paper where data are extracted.

4.1.2.3. Software materials and procedures: This element includes the software that operates computers. They can be subdivided into systems software, which means software that helps to carry out operations such as arranging and retrieving data from memory, and application software that operates organization data such as wage, accounting and manufacturing programs. This is in addition to the procedures systems, which include processes that describe and arrange specific steps and instructions to complete computer operations. They are called a system path map that explains what must be done.

4.1.2.4. Data and information: This element includes color-coded images, numbers and observations, in addition to databases.

4.1.3. Benefits of human resources information system

This system provides the departments in the organization with strategic data and information, not just in staff recruiting and retention strategies, but also in integrating HRIS data into a wide range of institutional strategies. The captured and extracted data from the human resources information system to the concerned department an appropriate and efficient tool for decision-making. Even though the rationale for implementing the human

resources information system varies among organizations, some use it to cut costs; others use it to facilitate better communication. Still, others use it to reorient human resources operations to increase the contribution of strategic management (Parry, Tyson, Selbie, & Leighton 2007). However, the human resources information system can have wide uses ranging from simple spreadsheets to complex math operations that can be performed so easily (Parry, 2010). Through the use of appropriate human resources management systems, companies will be able to perform mathematical operations that have effects on the businesses of an organization as a whole. These operations include health care costs for each employee, payment of benefits as a percentage of the operating expenses, and the cost for each recruitment, the yield on training, rates of turnover, costs, and the time required to fill certain positions, the return on invested human capital, and human value (DeSanctis, 1986).

4.2. Innovation

Innovation is the work that leads to development and innovation that makes the organization progress ahead of others, in the presence of enlightened management that manages the organization with innovation and high distinction. The underlying aim of this effort is to reach the best results and required outputs. Innovation helps organizations adapt to the successive changes and helps them face multiple and different challenges, and thus achieve a competitive advantage (Al-Mughrabi, 2007) (Al-Khasawneh, 2013). Innovation can be a source of competitive advantage for companies, through either improving methods or technologies that are capable of generating new products or services or improving existing products or services. As such, it is particularly important to measure innovation and discuss the associated outcomes (Tagues, et, al, 2021). Innovation can bring benefits related to business management, both internal and external, especially through more dynamic and efficient production processes. It can also generate new products and services, or make improvements to the existing ones. Innovation means novelty, finding something new in quality that has been created through learning processes and knowledge (Durst, Mention, & Poutanen, 2015) (Malkawi et. Al., 2018). Therefore, monitoring and embracing creative performance are important from different angles. For managers in companies, medium and long-term corporate strategies can be developed. For investors, they help in making effective decisions to increase the invested resources. For public policymakers, they help with tax incentives. For agencies that promote research, they help set standards that target funding. For public and private educational institutions, they help in conducting joint projects to develop technology (Borins, 1998, Damanpour, Walker, & Avellaneda, 2009). The capacity for innovation increases according to the size of the organization. Hence, small organizations are less likely to innovate. However, through innovation, the effect associated with sales tends to be more significant in larger organizations. In light of the above, the challenge that the available literature suggests is to adjust the indicators for different innovation patterns, i.e., measure the innovation phenomenon appropriately while allowing the possibility of comparison, in terms of either time, industry, or even region (Kemp, et al., 2003). However, innovation in the company may be in the form of new ideas that are applied to products, services, processes (operational or administrative), or even in the market. Consequently, the scope of innovation may vary to include individuals, the organization as a whole, its sector, or the entire industry (Damanpour et al. 2009).

4.2.1. Importance of innovation

The idea of innovation has become widely accepted and spread in all organizations and countries. Innovation and innovation have become a part of the culture for many governments and private companies and organizations. If the companies wish to exist and continue work, they must be able to adapt and evolve. This is because the ability to change and adapt is essential for them to survive, continue and grow. For companies to achieve their goals, they have to adapt and manage innovation wisely and creatively to control products, sales and profits. Some businesses and organizations are considered more creative than others due to their interest in industrial research and development that is considered among the most important influences on innovation and innovation. It has always been said that innovation is the driver of growth, and can make that growth, almost regardless of the status and size of the economy (Trott, 2017) (Al-Khasawneh, 2012). Schumpeter was an earlier economist who stressed the importance of new innovative products as stimulators for economic growth. For example, economies witnessed significant growth due to innovating and developing modern products, like smartphones, new computer software, new pharmaceuticals, modern advanced cars that are run by electricity. Earlier remarks indicated that innovation and innovation in products is a major driver to bringing about economic development (Trott, 2017). A series of innovation studies were conducted in the past century. They focused on the internal characteristics of innovation in the economy (Borins, 1998, Damanpour, Walker, & Avellaneda, 2009). Those studies looked into the following:

- generating new knowledge.
- applying this knowledge in the development of products and operations.
- Generating income out of these products and services through commercial utilization.

Individuals are key to innovation in organizations. They are the ones who define the problems and have the ideas. They perform and have creative connections and associations that lead to inventions. In addition, the managers

in an organization are the individuals who decide on the activities that have to be assigned, the resources that have to be deployed and how to be implemented. This led to the development of the so-called key individuals in the creation process, such as the inventor, leader, entrepreneur, etc.

4.2.2. Innovation and invention.

There is confusion between these two concepts. The concept of innovation is close to the concept of the invention, but they are not synonyms or mutually exclusive. Therefore, it is important to define clear meanings for them, as innovation itself is a very broad concept that can be understood in a variety of ways. Innovation is not a single act but an entire process of interconnected sub-processes. It is not just a conceptualization of a new idea, nor the invention of a new device, the development of a new market. It is all of these things acting together and uniting in an integrated way. It is important to explain that the term "new" must be used in the context of innovation. If an idea sounds new and different to an individual, it is innovation (Heiskanen et al, 2007). Most writers distinguish innovation from invention in that invention is the new concept or idea, while innovation is the subsequent translation of the invented idea into a practical reality in commerce and economics. So, innovation is the process of transforming new ideas into tangible reality through the commercial and practical implementation of ideas or inventions. (Heiskanen et al., 2007). The process of transforming mental ideas into a new tangible reality (usually a product or process) is an invention. Innovation is a process that has several distinct characteristics that must be managed well (Trott, 2017). Innovation can be defined as the management of all activities involved in the process of generating ideas, developing technology, manufacturing and marketing a new (or improved) product, or the manufacturing process, or equipment. Innovation, however, is thinking about new, novel and appropriate ideas. While innovation is the successful implementation of those ideas in the organization (Sampson and Spring, 2012).

5. Review of related literature

Malkawi, Nazem (2018b). Using Electronic Human Resource Management for Organizational Excellence -Case Study at Social Security Corporation – Jordan. The study aimed to know the role of electronic human resources management in achieving institutional excellence in the Social Security Corporation - Jordan. The study found that the level of use of electronic human resources management in the Social Security Institution - Jordan is high, the organizational excellence is at a high level also, and that there is a significant effect of electronic human resources management on institutional excellence as a whole in all its components. The study recommended Social Security Corporation expand the use of electronic human resources management at all levels and functions of the organization. The study also suggested enhancing the utilization of electronic human resources management in institutional excellence in all its components, and to educate workers in the Social Security Corporation to achieve regulatory achievement by adopting electronic human resources management applications.

Quaosar, Azmal, Ali, (2017). Determinants of the Adoption of Human Resources Information Systems in a Developing Country: An Empirical Study, the International Technology. This study examined the relationship between innovation, organizational and environmental characteristics, and adoption of the human resources information system. The results indicated that the size of the organization has a major influence on the extent to which the human resources information system is adopted. This study also contains noteworthy theoretical and practical contributions to the field of human resources information systems.

Obeidat, Bader (2012). The Relationship between Innovation and Human Resource Information System (HRIS). This study aimed to verify the relationship between innovation and the Human Resources Information System. The theoretical framework of this study is based on previous literature that discusses innovation and the human resources information system. It was found that there is a positive relationship between innovation and HRIS. More specifically, it has been found that there is a relationship between comparative advantage, compatibility, trial ability and observability on the one hand, and HRIS functions on the other hand. Moreover, no relationship between complexity as one of the dimensions of innovation deployment, and the functions of the human resources information system.

Ben Moussa, Nejib, El Arbi Rakia El Arbi (2020).The effect of Human Resources Information Systems on Individual Innovation Capability in Tunisian Companies: The Moderating Role of Affective Commitment. This research focused on studying the effect of using the human resources information system in the human resource (HR) department on individual innovation. The results showed that the use of HRIS enhances the individual innovation capacity of Tunisian HR employees. Moreover, it has been found that the emotional commitment of the employees mediates the relationship between the use of the HRIS and the ability for individual innovation. The more employees actively participate in their organization, the more positive and noteworthy effect of the HRIS on the individual innovation behavior of HR employees.

Kumar, Nikhal Aswanth& Parumasur, Sanjana Brijball 2013. The Effect of HRIS on Organizational Efficiency: Random or Integrated and Holistic? This study examined the extent to which the human resource information system enhances organizational efficiency coherently and comprehensively (as defined by the effect

of the human resources information system on the areas of human resources, time management, cost management, and administrative satisfaction with the system). The results indicate that the HRIS significantly enhances the overall organizational efficiency and its sub-dimensions (human resources functions, time management, cost management, and system satisfaction) coherently and comprehensively and in varying degrees.

Monga, Hitesh, (2017). The Effect of Information Systems on the Performance of Human Resources Department. The study aimed to find out the extent of using the human resources information system to increase the administrative and strategic functions of the human resources department. The results showed that the human resource information system is used more as a management tool than as a strategic tool. The study also showed that the human resources information system is used positively as a tool to achieve administrative efficiency by adding value to the department. While the study did not identify all the benefits of HRIS, it has not fully demonstrated the usefulness of the Human Resources Information System as a strategic tool. The reason for this is not to use the system to its fullest potential.

Boateng, Asafo-Adjei Agyenim. (2007). The Role of Human Resources Information Systems (HRIS) in Strategic Human Resources Management (SHRM). The study aimed to investigate the role of human resources information systems in strategic human resources management. In addition, it sought to find out how human resource specialists and managers in different organizations see the effects of the HRIS on strategic HR tasks and job roles. The study showed that HR professionals not only viewed the use of HRIS as a tool to support strategic HR tasks but also saw it as an enabling technology. The study also indicated that large-scale companies were likely to experience significant use of HRIS to support strategic HR tasks.

Al-Zoubi, Ali Ahmed Saleh (2004). The Effect of Human Resources Information Systems on the Performance of Human Resources Management in First-Class Hotels in Jordan. This study aimed to investigate the effect of using human resources information systems in first-class hotels in Jordan on the performance of human resources management in these hotels. The results showed the effectiveness of human resources management in making decisions related to employees, ease in implementing procedures in the human resources function, job satisfaction, and motivation of human resources employees because of using these systems. The study recommended the necessity of consolidating the conviction of senior management and all hotel employees in the role that information systems play, in addition to the necessity of using human resources information systems in hotels that do not use such systems and increasing coordination between the human resources department and the department of management information systems.

Al-Raddaideh, Al-Hawamdeh and Al-Smirat Study (2020). The Effect and Efficiency of Management Information Systems on the Performance of Human Resources: An Empirical Study on Employees at Mu'tah University - Jordan. The study sought to identify the efficiency of management information systems and their effect on the performance of human resources from the point of view of Mu'tah University employees. The study concluded that the efficiency of management information systems used in the university was at a high level, and the use of management information systems and their various applications had a great effect on improving the performance of human resources in terms of increasing the speed of work, work completion, and raising the quality of employees' performance. The study recommended that the university should continue in using administrative information systems and tools, and work to provide the necessary infrastructure for this and keep abreast of technical changes, as it has a great role in supporting and improving the performance in general and the human resources performance in particular.

Masoud's (2015). Evaluating the Effect of the Human Resources Information System on the Human Resources Management Functions in the Regional Directorate of Production of the Sonatrach Corporation. The study aimed to demonstrate the contribution level of the human resources information system applications in assisting decision-making related to human resource practices: employment, human resources planning, employee performance evaluation, training and performance management, and the career path. The study found that the human resources information system had a direct effect on the efficiency and effectiveness of the human resources practices, recruitment, training, compensation, and career path planning, as it contributed to increasing the accuracy of operations and providing the necessary information about the human resources. While the study found that the contribution of the human resources information system to the performance evaluation process was moderate due to the lack of optimum utilization of the system in this practice.

6. Research Methodology

To achieve this study the researcher adopted the descriptive-analytical deductive approach because it is suitable to the nature of the study and its objectives. This approach is also based on studying the phenomenon as it is in reality and then describes it as a precise description and analysis of the effect and relationships between variables. Where the opinions of workers in Jordanian telecommunications companies about human resources information systems and their effect on innovation were surveyed. Moreover, results and conclusions are extracted to answer questions of the study at testing its hypotheses.

6.1. Objectives of the study

The general objective of the study is to know the effect of human resources information systems with all its components (human resources planning information systems, selection and recruitment information systems, training & development information systems, performance appraisal information systems, and compensation information systems) on innovation at Jordanian telecommunication companies through the following objectives:

- Finding out the level of human resources information systems at Jordanian telecommunication companies.
- Finding out the level of innovation at Jordanian telecommunication companies.
- Finding out the effect of human resources information systems on innovation at Jordanian telecommunication companies.
- Giving recommendations in this regard.

6.2. Questions of the study

1. What is the level of human resources information systems at Jordanian telecommunication companies?
2. What is the level of innovation at Jordanian telecommunication companies?
3. What is the effect of human resources information systems on innovation at Jordanian telecommunication companies?

6.3. Study limits

- Time limitations: This study was conducted during the first quarter of 2021.
- Spatial limitations: Jordanian telecommunications companies.

7. Research Model and Hypotheses.

7.1. The main hypothesis:

- There is a significant positive effect at ($\alpha \leq 0.05$) of human resource information systems with all its components (human resource Planning information systems, Selection and recruitment information systems, Training & development information systems, Performance Appraisal information systems, and Compensation information systems) on innovation at Jordanian telecommunication companies.

7.1.1. Minor hypotheses are:

P1: There is a significant positive effect at ($\alpha \leq 0.05$) of human resource planning information systems on innovation at Jordanian telecommunication companies.

P2: There is a significant positive effect at ($\alpha \leq 0.05$) of Selection and recruitment information systems on innovation at Jordanian telecommunication companies.

P3: There is a significant positive effect at ($\alpha \leq 0.05$) of human resource Training & development information systems on innovation at Jordanian telecommunication companies.

P4: There is a significant positive effect at ($\alpha \leq 0.05$) of Performance Appraisal information systems on innovation at Jordanian telecommunication companies.

P5: There is a significant positive effect at ($\alpha \leq 0.05$) of Compensation information systems on innovation at Jordanian telecommunication companies.

7.2. Research Model.

Figure (1) shows study model (dependent and independent variables).

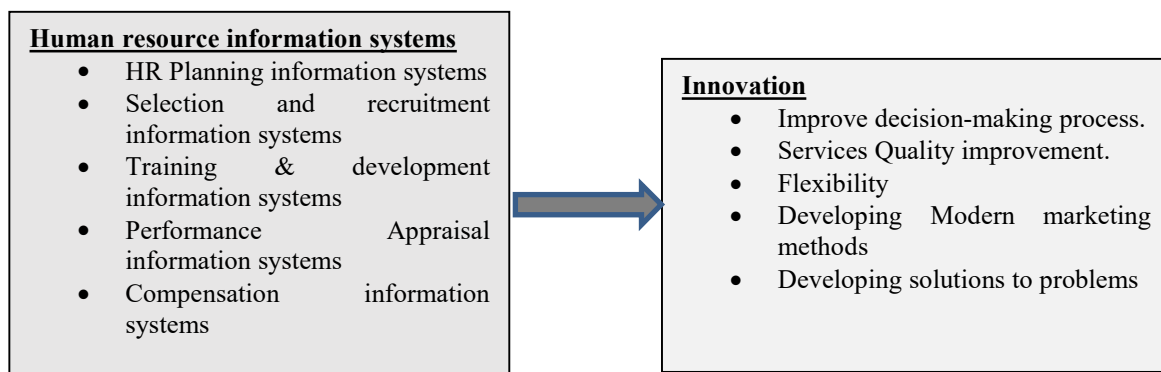


Fig. 1. Study model

7.3. Data collection

The study used descriptive-analytical methodology. Therefore, the researcher depended on (Malkawi et. Al., 2010; Malkawi et. Al.; 2017, Al-Khasawneh, 2014; Ben Moussa, Nejb, El Arbi Rakia El Arbi, 2020; Shiyaa, 2019; Tomanna et. Al., 2018). In addition, others to develop a questionnaire for collecting data from the study sample. Face and content validity were done by faculty members in Jordanian universities whose major is related to the subject of the study. The resulting items were ordered randomly for each construct and the Likert 1-5 scale was used for measuring the responses.

7.4. Study population and sample

The study community consisted of all Jordanian public shareholding telecommunication companies registered at the Amman Stock Exchange Market for the year 2021, which are (3) telecommunications companies. The study population and unit of analysis consisted of employees at Jordanian telecommunication companies. A simple probability sample was selected and consisted of (384) employees. So (384) questionnaires were distributed to collect the field data from Telecommunication companies, (336) valid questionnaires of them were recovered (87%).

7.5. Data analysis

The aim of this study is to investigate the role of human resource information systems on innovation at Jordanian telecommunication companies. Researcher used five sub variables to reflect the role of human resource information systems including human resource Planning information systems, Selection and recruitment information systems, Training & development information systems, Performance Appraisal information systems, and Compensation information systems. This study predicts that human resource information systems variables have effect on innovation at Jordanian telecommunication companies. To achieve the main objective of this study we performed several analyses as it appears in the next sections.

8. Findings

8.1. Descriptive statistics

In this section, we present demographic characteristics of the respondents and descriptive statistics regarding the research variables. As mentioned above (336) valid responses were recovered, Table (1) below shows demographic variables for the study sample.

Table 1: Demographic variables n (870)

Variables	Frequency	Percent
Gender		
Male	191	57%
Female	145	43%
Total	336	100%
Educational level		
Bachelor	269	80%
Postgraduate studies	67	20%
Total	336	100%
Age		
20-30	112	33%
More than 30-40	123	37%
More than 40-50	56	17%
More than 50	45	13%
Total	336	100%
Experience		
1-5	112	33%
More than 5-10	78	23%
More than 10-15	79	24%
More than 15	67	20%
Total	336	100%

Table (2) shows the descriptive statistics of the variables investigated in this study as assessed by the respondents. The respondents' perception for each variable is assessed based on its mean. The mean is divided into low if (< 2.33), moderate if (≥ 2.33 and ≤ 3.67), and high if mean (> 3.67). Having this in mind, the respondents of this study generally assessed human resource information systems as high with total mean (3.77). In addition, they assessed their human resource information systems as high in term of technology used and low in quality of data opened. In addition, the level of innovation was high as the total mean is (3.78). Table 1 shows

descriptive statistics.

Table 2. Descriptive statics of the variables

#	Item	Mean	Stand. Deviation
1	The company depends on planning human resources information systems in planning for its human resources	3.80	0.54
2	The human resource planning information systems used in the company suit the nature of work	3.66	0.52
3	The human resource planning information systems used in the company facilitate the tasks performance	3.90	0.48
4	The human resource planning information systems used help in identifying various tasks.	3.93	0.56
5	The human resource planning information systems are constantly updated.	2.71	0.58
6	The company uses human resource planning systems in various stages of human resource planning	4.03	0.54
7	The company depends on human resource planning information systems in determining its personnel needs	3.8	0.45
Human resource planning information systems		3.69	0.84
8	selection and recruitment information systems match the business needs of the company	3.9	0.59
9	Selection and recruitment information system in the company contains the detailed and necessary data for selection and recruitment of human resources.	3.83	0.64
10	The company is constantly updating its recruitment and selection information systems.	3.63	0.80
11	The company depends on selection and recruitment information systems to communicate with job applicants.	3.9	0.83
12	The company depends on selection and recruitment information systems to search for the talent it needs.	4.06	0.66
Selection and recruitment information systems		3.86	0.76
13	The company depends on training and development information systems for the development and training of human resources.	3.83	0.84
14	Training and development information systems in the company are compatible with its training plans.	3.93	0.59
15	The training and development information systems are constantly updated	3.93	0.64
16	Training and development information systems contribute in performance excellence	3.93	0.80
17	The company determines the training needs electronically.	3.8	0.83
Training and development information		3.88	0.79
18	The company has appropriate performance appraisal information systems.	3.8	0.78
19	The performance appraisal information systems used in the company help in performance appraisal efficiently.	3.75	0.84
20	performance appraisal information systems in the company are constantly updated	3.63	0.59
21	The company's performance appraisal information systems facilitate performance appraisal in the company	3.62	0.64
22	Performance evaluation information systems used in the company contribute in increasing employees' performance.	3.8	0.80
23	Performance appraisal information systems implemented in the company reduces the costs of the performance appraisal process.	3.75	0.83
Performance appraisal information systems		3.72	0.68
24	The company uses appropriate compensation information systems.	3.76	0.59
25	The compensation information systems used in the company are working efficiently.	3.82	0.64
26	The compensation information systems available in the company are constantly updated.	3.53	0.80
27	The incentive system in the company is electronically linked with wages system.	3.66	0.83
28	The compensation information systems available in the company help in determining wages and incentives objectively	3.76	0.66
Compensation information systems		3.71	0.86
Human resources information systems		3.77	

29	The company relies on human resources information systems to make decisions related to human resources	3.6	0.84
30	The use of human resource information systems in the company improves the decision-making process.	4.11	0.59
31	The use of human resource information systems in the company speeds up decision-making process	3.8	0.64
32	The decisions made in the company are wisdom and rationale.	3.86	0.80
33	The decisions made in the company are characterized by flexible	3.86	0.83
Decision making improvement		3.84	0.73
34	The services provided by the company are of high quality	3.90	0.78
35	The services are provided and accomplished quickly	3.86	0.84
36	Services are provided electronically and remotely.	4.00	0.59
37	The services provided by the company are easy to use	3.96	0.64
38	The services provided by the company are characterized by diversity.	4.16	0.80
Services quality improvement		3.98	0.83
39	The procedures and processes within the company are flexible.	3.90	0.66
40	The company's regulations and instructions are flexible to serve workers and clients to use.	3.76	0.78
41	The company provides various, switchable, and integrated services to its customers	3.70	0.84
42	Human resource information systems facilitate job rotation among the company's employees	3.75	0.59
Flexibility		3.78	0.77
43	The company uses updated marketing methods	3.90	0.80
44	The company strives constantly to innovate new marketing methods.	3.63	0.83
45	The marketing methods used by the company suit the needs and behavior of consumers.	3.73	0.66
46	Marketing methods used by the company are commensurate with consumers' financial capabilities.	3.53	0.78
Developing new marketing methods		3.70	0.91
47	The company adopts modern and innovative approaches in solving problems	3.60	0.59
48	Employees are consistently use and provide variety and innovative solutions for problems.	3.60	0.64
49	There is a co-creation between employees in the company in problem solving	3.66	0.80
50	There is speed and ingenuity in resolving employees' issues.	3.63	0.83
Creating solutions to problems		3.60	0.82
Innovation		3.78	

As shown from table (2) human resource planning information systems as a sub variable for human resource information systems comes in a high level with mean (3.69) and standard deviation (0.84). High level with mean (3.86) and standard deviation (0.76) for Selection and recruitment information systems, high level with mean (3.88) and standard deviation (0.79) for Training & development information systems. High level with mean (3.72), and standard deviation (0.68) for Performance Appraisal information systems,. high level with mean (3.71), and standard deviation (0.86) for Compensation information systems, human resource information systems as a whole also in high level with arithmetic mean (**3.77**), Table (2) show also that Decision making improvement as a sub variable for innovation comes in a high level with mean (3.84) and standard deviation (0.73). High level with mean (3.98) and standard deviation (0.83) for Services quality improvement, high level with mean (3.78) and standard deviation (0.77) for Flexibility. High level with mean (3.70),. Moreover, standard deviation (0.91). For developing new marketing methods, in a moderate level with mean (3.60). And standard deviation (0.82) for Creating solutions to problems, and Innovation as a whole in high level with mean (**3.78**), Before regression analysis researcher examined the internal consistency of the variables by estimating the Cronbach's Alpha to confirm the data quality. The values were (0.82) for Human resource IS, (0.84) for **Innovation**, and (0.85) for the total instrument, which are above the value (0.70). These figures confirm that our data can be used safely in regression analyses and testing hypotheses. Table 3: shows the Cronbach's alpha values.

Table 3: Cronbach's alpha

Variable name	Cronbach's alpha
human resource Planning IS	0.72%
Selection and recruitment IS	0.81%
Training & development IS	0.83%
Performance Appraisal IS	0.78%
Compensation IS	0.84%
Human resource IS	0.82%
Improve decision-making process.	0.87%
Services Quality improvement.	0.85%
Flexibility	0.79%
Developing new marketing methods	0.78%
Developing solutions to problems	0.81%
Innovation	0.84%
Total	0.85%

Also before regression analysis, we examined for the normal distribution of the data, Multicollinearity issue, and the internal consistency of the variables to confirm the quality of data examined. We estimated the data Skewness and Kurtosis to assess the normality of data. As shown in table (4), the values of Skewness and Kurtosis for each variable are less than the threshold of absolute value of (2). This suggests that our data is normally distributed. For Multicollinearity issue, Variance Inflation Factor (VIF) is a frequently used to inspect Multicollinearity. According to the rule of thumb, a VIF value of (5) and higher indicates a potential problem of Multicollinearity (Hair& Anderson, 2010). The results presented in table (4) show that the VIF values vary between (1.143 and 2.263) which less than the cut-off value of (5). Therefore, the proposed path model has no Multicollinearity issue. Table (4) Skewness and Kurtosis analysis.

Table 4: Skewness, Kurtosis, and VIF of all variables

Variable name	Skewness		Kurtosis		VIF	Toleranc e
	Statistic	Std. Error	Statistic	Std. Error		
Total human resource information systems	-0.476	0.273	0.373	0.559	1.143	0.830
Innovation	-0.636	0.272	0.588	0.542	1.175	0.830
human resource Planning IS	-0.330	0.287	-0.643	0.549	1.934	0.625
Selection and recruitment IS	-0.575	0.276	1.002	0.558	2.263	0.424
Training & development IS	-0.545	0.299	0.578	0.556	1.186	0.550
Performance Appraisal IS	-0.352	0.276	-0.653	0.558	1.814	0.565
Compensation IS	-0.491	0.273	0.366	0.539	1.239	0.451

8.2 Hypotheses testing

To examine our hypotheses, we run two models. In the first model, we examine the main hypothesis, which predicts a positive and significant relationship and effect between human resource information systems and innovation. In the second model, we examine the effect of each dimension of human resource information systems including human, resource Planning information system, Selection and recruitment information system, Training & development information system, Performance Appraisal information system, and Compensation information system on innovation.

As shown in table (5), the result of the first model indicates that human resource information systems as a whole explains about 0.60 ($R^2=0.60$) of the variance in the innovation, and the F-test is significant at ($p < 0.00$). This suggests that human resource information systems as a whole have a significant effect on innovation as a whole. The sign of the innovation's standardized coefficient is positive. This suggests that the relationship is positive and significant at $P < 0.05$. This result offers a sufficient evidence to accept the main hypotheses in this

study.

Table 5: The results of OLS regression between human resource information systems and innovation

Model	F test	R	R ²	standardized coefficients (Beta)	t	Sig.
1 (Constant)					6.142	0.000
Overall human resource information systems	13.51**	78	0.60	0.481	4.532	0.000

*** signifies significant at 0.00

The results of the second model, which examines the effect of each dimension of human resource information systems on innovation, is presented in table (6). The overall F-test is significant at ($p < 0.00$), indicating that the dimensions of human resource information systems are significant jointly. The model explains about 0.60 as reflected by R^2 value. Individually, the result shows that the standardized coefficients (Beta) of Selection and recruitment information system is not significant at $p < 0.05$. This indicates that Selection and recruitment IS individually has no effect on innovation. Accordingly, we reject the sub hypotheses (P2) that technology has positive effect on innovation. Moreover, the same table shows that the standardized coefficients (Beta) of planning information system is significant at $p < 0.05$, this indicates that planning information system individually has effect on innovation. Accordingly, we accept the sub hypotheses (P1) that planning information system has positive effect on innovation. This suggests that as planning information system increases, innovation increase. The standardized coefficients (Beta) of training & development information system is significant at $p < 0.05$, this indicates that training & development information system individually has effect on innovation. Accordingly, we accept the sub hypotheses (P3) that training & development information system has positive effect on innovation. This suggests that as training & development information system increases, innovation increase. The standardized coefficients (Beta) of Performance Appraisal information system is significant at $p < 0.05$, this indicates that Performance Appraisal information system individually has effect on innovation. Accordingly, we accept the sub hypotheses (P4) that Performance Appraisal information system has positive effect on innovation. This suggests that as Performance Appraisal information system increases, innovation increase. The standardized coefficients (Beta) of Compensation information system is significant at $p < 0.05$, this indicates that Compensation information system individually has effect on innovation. Accordingly, we accept the sub hypotheses (P5) that Compensation information system has positive effect on innovation. This suggests that as Compensation information system increases, innovation increase.

Table 6: The result of OLS regression between each dimension of human resource information systems and innovation.

Model	F test	R	R ²	Standardized coefficients (Beta)	t	Sig.
(Constant)	9.56***	0.78	0.60		0.000	0.000
human resource Planning IS				0.054	0.000	0.000
Selection and recruitment IS				-0.281	0.262	0.262
Training & development IS				0.054	0.000	0.000
Performance Appraisal IS				0.063	0.000	0.000
Compensation IS				0.061	0.000	0.000

*** signifies significant at 0.00

9. Results

The main results of the study are:

1. The level of human resource information systems in Jordanian from the view point of Telecommunications companies' employees is high with mean (3.77).
2. The level of innovation in Jordanian Telecommunications companies also moderate from the view point of Telecommunications companies' employees is high with mean (3.78).
3. There is a significant positive effect at ($\alpha < 0.05$) of human resource information systems on innovation at Telecommunications companies, and interpreted (60%) of variance at innovation. This assures the role of (human resource information systems) on innovation.
4. There is a significant positive effect at ($\alpha < 0.05$) of human resource information systems components on innovation individually, except selection and recruitment information systems which has no effect.

10. Discussion and recommendations

The researcher believes that organizations in general and telecommunication companies in particular nowadays

realize the role of human resources information systems in achieving competitive advantage and survival. The adoption of human resources information systems by the telecommunication companies is considered a necessity presently. Clear understanding and alignment of human resources information systems for innovation is essential to realize the potential benefits for telecommunication companies. This study examined the role of independent variable (human resources information systems) on the dependent variable (innovation) from Jordanian Telecommunication companies' employees' point of view. The findings of this study indicated that the level of human resources information systems was high and innovation was high. There was a positive effect of human resources information systems on innovation. Therefore, telecommunication companies should be aware of the benefits that can be obtained by depending on human resources information systems and realize the role of human resources information systems in innovation today.

Therefore, the adoption of human resources information systems is the key to success in innovation, which is the first implication of this study. This would lead to encouraging the adoption of human resources information systems. Secondly, because of the expected benefits of human resources information systems, the Jordanian telecommunication companies should benefit from opportunities that come from human resources information systems in their companies. Thirdly, because of competitive pressures; telecommunications companies should take into account that human resources information systems would help them to compete and grow.

Therefore, the originality of this study comes from the importance of human resources information systems in innovation, and from studying an important issue (i.e., whether innovation is affected by the adoption of human resources information systems). It is important in relating human resources information systems and innovation in Jordanian Telecommunications companies.

In light of the above, the researcher recommended that the telecommunications companies expand the level of applying human resources information systems initiatives. He suggested that they support innovation, and increase the level of relying on human resources information systems to get benefits for their businesses.

11. Directions for future research

Following this research, future research can be conducted on human resources information systems to find their effect on innovation using the same or other variables. In addition, the effect on other areas and sectors may also be investigated.

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