THE IMPACT OF HUMAN RESOURCES INFORMATION SYSTEMS ON INSTITUTIONAL PERFORMANCE

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**THE IMPACT OF HUMAN RESOURCES INFORMATION
SYSTEMS ON INSTITUTIONAL PERFORMANCE**

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ZUBAIDAH ABDULHAKEEM MAJEED QATAB**

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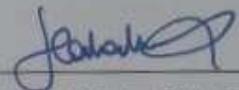THE DEPARTMENT OF
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This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.
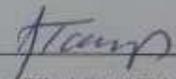
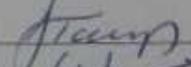Assist. Prof. Dr. Sibel TARIYAN ÖZYER
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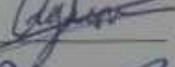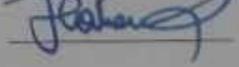**Examination Date: 18.08.2016**

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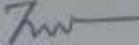
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ABSTRACT

THE IMPACT OF HUMAN RESOURCES INFORMATION SYSTEMS ON INSTITUTIONAL PERFORMANCE

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We are living in an epoch of changes during which highly competitive advantages are always required for quick and effective reactions in any organization. It is expected that the rate of change will increase greatly in the upcoming future along with the high development rate of new technologies. Today's businesses need either to adapt to these changes or be more innovative to meet these new necessities. Numerous academic researchers have stated that the success and accomplishment for any business enterprise are subject to the efficient management of its human resources. In this research, the Human Resources Management System (HRMS) has been aim to study and review its importance for small and medium-sized enterprises, especially Human Resources Information System (HRIS). In addition, the benefits and constraints of the implementation of a Human Resources Information System (HRIS) on an institution have been discussed in this thesis. Moreover, HRIS open source software to the University of Kirkuk has been design to implemented and expected benefits have been discussed.

Keywords: Human Resources Management System (HRMS), Human Resources Information System (HRIS), Human Resources (HR), Document Management System (DMS), Strategic Human Resources Management (SHRM).

ÖZ

İNSAN KAYNAKLARI BİLGİ SİSTEMLERİNİN KURUMSAL PERFORMANS ÜZERİNE ETKİSİ

QATAB, Zubaidah Abdulhakeem Majeed

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Biz son derece rekabetçi avantajları herhangi bir organizasyonda hızlı ve etkili reaksiyonlar için her zaman gerekli olan değişikliklerin olduğu bir çağda yaşıyoruz. Değişim hızının yeni teknolojilerin yüksek gelişme oranı ile birlikte önümüzdeki gelecekte fazlasıyla artacağı beklenmektedir. Bugünün iş kuruluşları, bu değişimlere uyum sağlamaya ihtiyaç duyarlar ya da yeni ihtiyaçları karşılamak için daha yenilikçi olmaya ihtiyaç duyarlar. Birçok akademik araştırmacı herhangi bir işletmenin başarı ve becerisi için insan kaynaklarının etkili yönetimine tabi olduğunu ifade etmişlerdir. Bu araştırmada, İnsan Kaynakları Yönetim Sisteminin (HRMS) çalışılması amaçlanmıştır ve küçük ve orta ölçekli işletmeler için, özellikle İnsan Kaynakları Bilgi Sisteminin (HRIS) öneminin gözden geçirilmesi amaçlanmıştır. Ayrıca, bu tezde bir kurumdaki İnsan Kaynakları Bilgi Sistemi (HRIS) uygulamasının faydaları ve kısıtları tartışılmıştır. Buna ek olarak, Kerkük Üniversitesinde HRIS açık kaynak yazılım uygulanması uygulanmıştır ve beklenen faydaları tartışılmıştır.

Anahtar Kelimeler: İnsan Kaynakları Yönetim Sistemi (HRMS), İnsan Kaynakları Bilgi Sistemi (HRIS), İnsan Kaynakları (HR), Doküman Yönetim Sistemi (DMS), Stratejik İnsan Kaynakları Yönetimi (SHRM).

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LIST OF ABBREVIATIONS

ANN	Artificial Neural Network
ATMA	Agricultural Technology Management Agency
ATCH	Architecture Theory Criticism
AGPL	Affero General Public License
A1 eHR	Electronic Human Resources
CSV	Comma Separated Values
ESS	Employee Self Service
ERP	Enterprise Resource Planning
GPL	General Public License
HRM	Human Resources Management
HRIS	Human Resources Information Management System
ICT	Information and Communications Technology
LDAP	Lightweight Directory Access Protocol
MSS	Manager Self Service
OSS	Open-Source Software
PIM	Personal Information Management
PTO	Paid Time Off
SHRM	Strategic Human Resources Management
THRM	Traditional Human Resources Management

CHAPTER 1

INTRODUCTION

1.1 Introduction

Human Resources Management (HRM), (or in abbreviated form, HR), is any proper
process that endeavors to utilize the most available skilled labor force in any
organization. The core purpose of Human Resources Management is to have well-
organized use of the standing human resources within an association. The term
"Human Resources Management" is derived as follows: *human*, the skilled staff in
an association; *resource*, mentioned to imply restricted availability, or scarcity, of
any resource; and *management* refers to fully and properly utilizing and making the
best use of limited and scarce resources [1].

Human Resources Management (HRM) can include many other sub systems inside
it, such as the process of recruitment, selection of employees, and provision of the
proper orientation for an organization and its employee induction system. A Human
Resources Management System can also provide proper training information along
with developing skills information, assessment of employees, as well as providing
proper compensation and employee information. Furthermore, it preserves the proper
relations between employees, administration and labor, maintains employee safety,
their health and welfare, and many other sub systems [1].

While HR is a more comprehensive system, the Human Resources Information
System (HRIS) is dedicated to achieving and serving any employee's affairs. HRIS
can be permanently distinct as an integrated system castoff to collect, analyze and
store information regarding an administration's human resources [2].

A Human Resources Information System (HRIS) is used to manipulate, acquire, analyze, store, retrieve and distribute information about an administration's human resources. A Human Resources Information Management System is not limited to the computer software applications and/or hardware that encompass the physical part of the system. It also includes the procedures, policies, data required and the people to manage the HRIS functions. HRIS covers many functions, such as planning, controlling, organizing, leading and staffing. This study intends to discover the importance of Human Resources Information Management Systems and their importance to any organization.

1.2 Research Objective

Iraq is considered to be one of the developing countries that have suffered from many problems on the political, economic and social level, which has contributed significantly to the delay in the development of several areas, especially in the service sector and in areas of information and communication technology. Despite these factors, Iraq still continues progressing to reduce this gap. Many Iraqi institutions have lacked an effective system for the management of human resources. This research aims at the following:

1. A study of Human Resources Management Systems (HRMS) and review its importance for small and medium-sized enterprises, especially Human Resources Information Systems (HRIS);

2. A discussion of the benefits and constraints of Human Resources Information Systems (HRIS) on Institutional Performance;

3. The selection of the University of Kirkuk as a case study and revision of the possibility of implementing a HRIS system there;

4. Suggesting a HRIS system for the University of Kirkuk, wherein the system would provide accurate information about human resources in an organization and their functioning, along with any relevant environmental factors to provide relevant information, in addition to providing timely information management; and

5. Implementing the HRIS system and test system functionality.

1.3 Thesis Structure

Human Resources Information Systems (HRIS) are a complex issue that will require much focus on public and private concepts. Through this study, we have divided our research into five chapters as follows:

Chapter 1 presents the outline and research objective.

Chapter 2 reviews the theoretical perspectives that underpins the main model that was used as a Human Resources Management and Human Resources Management Information System, along with other prospects related to our subject.

Chapter 3 evaluates the literature linking to Human Resources Information Systems (HRIS), and their administrative performance, along with summaries of a few key revisions in this research area.

Chapter 4 deliberates the research approach, provides an impression of the case selection, implementation, test and result parts.

Chapter 5 discusses the findings in addition to a number of recommendations for future work being highlighted.

CHAPTER 2

HUMAN RESOURCES MANAGEMENT SYSTEM

2.1 Human Resources Management (HRM)

We live in an era of rapid advancement towards the use of new technologies in various aspects of life. Many new concepts that influence life style and decision-making have emerged. This is also the case for administrative systems. These new concepts are also in constant evolution, which compels many establishments to work and adapt in order to accommodate these developments and make serious attempts to reach the same level. A number of institutions have been forced to alter the mechanics of their work to meet these changes [3].

During the 1970s and 1980s, a new term was coined in North America, namely *Human Resources Management* (HRM) [4]. There have also been many attempts to work on a precise definition of the concept Human Resources Management since that time; however, the most common definition that can be found is the following: *an attempt to regulate the relationship between the employee and the employer as part of a foundation* [5]. Naturally, a system has several development operations from the beginning of its inception. Due to the large amount of development occurring in the Information Technology field, it went from a paper system to a fully electronic system.

Moreover, the concept of Human Resources Management has added many features to the classic management system since its establishment. However, this system is not considered to be a substitute for the actual management of a corporation. In fact, it is considered to be an important factor in the evolution of the concept of an administration [6].

Therefore, it is considered to be a descriptive label of the concept of administration in a specific area. There are also other attempts to make Human Resources Management systems more holistic, such as the definition by Beer et al. (1984) [7],

4

who state that Human Resources Management as *"all management decisions and actions that affect the nature of the relation between the organization and employees – their human resources."* This definition states that Human Resources Management systems have a suppositional dynamic relation between individuals and their administrations, and this relationship is influenced in both directions. The next understanding of the same above definition can be the following: namely that everyone in this institution is part of the performance of the Human Resource Management System.

Moreover, Barney (1991) [8] defines Human Resources Management systems as *"the training, experience, judgement, intelligence, relationships, and insight of individual managers and workers in a firm."* This refers to the development of human resources: Human Resources Management (HRM) activities are designed to develop the skills, attitudes, etc. for the institution and personnel that are part of the overall concept of Human Resources Management. From here, we can understand the overall organizational relationship between a Human Resources Management system and the employee within any framework.

Most managers and researchers have realized that the evolution of the work environment mainly depends on the evolution of the concept of the management of human resources. Ulrich (1997) [9] states that *"the competitive reality is that organizations will have to develop capabilities that will better serve their customers while differentiating the organization from its competitors."* Many researchers have been preoccupied with their interest in the development of a human resources management system in an attempt to learn how to make the best use of these resources by blending skills, abilities and knowledge. A Human Resources Management system became an essential component of the construction in every single fruitful association. HRM evolved with the development of information technology in several stages since the 1960s [10]. Table 1 shows the development stages of HRM.

Table 1 Development stages of HRM

Stages of development of HRM	Time Period	Focus of restructuring within the stage	Role
HR Limited Administration	Until the mid-1960s	Emphasis on restructuring of the HR database	Staff Office
HR Occupied Administration	From the mid-1960s until the mid-1980s	Emphasis on optimal legal handling of a full range of administrative tasks and deployment of HR departmental structure	Personnel Administration
HR Profession	In the 1980s and 1990s	Emphasis on increasing professionalization of the HR departments, development of services and tools, optimizing cooperation with other HR partners	Staff Management
HR Strategic	From the late 1990s, ongoing development	Emphasis on outsourcing, enablement of line managers of HRM, inclusion of new fields (e.g. knowledge management, cultural development, creation of a new model of cooperation between HR partners)	Occupational Partner and role sets

In recent years, many researchers have come together to improve the functionality and sense of satisfaction among employees with the good use of Human Resources Management systems, which reflected positively on the performance of organizations. The importance of Human Resources Management is the management strategy for people to have a sophisticated information system appropriate to the nature of development in the economic, political, legal and social areas surrounding the organization. A system that is capable of meeting the challenges and overcoming obstacles helps an administration to make good decisions, both of which are related to Human Resources Management or those that are related to the organization in general, thereby reducing costs and saving time [11]. Table 2 shows the most used strategies for the development of HRM.

Table 2 The most used strategies for the development of HRM [11]

Reinforce the quality and activities of HRM	Strategy and price tag reduction, activities and HRM	Original Strategies and activities of HRM
- Less opportunity to develop career - Apply criteria to results - Mainly apply criteria in the short term - Apply the criteria of the object in the same group - Apply the criteria employed - Apply some preferential policies - Wages averaged - Further training - Building relationships between managers and employees - For the active participation of workers - Analyze career goals - Mobilizing resources outside	- Fewer preferential policies - Salary levels - Less training - Construction of relationship managers - Traditional labor - For less participation by workers - Less opportunity to develop career - Apply the criteria of the process and results - Apply the short term criteria - Apply criteria used is the individual - Limitations apply the policy of insurance Laos - Analyze career depth - The use of resources within	- Apply a policy of insurance laws - Apply various preferential policies - Wages averaged - Training more - Building relationships between managers and employees - Apply the criteria of the process and results - Apply the long-term criteria - Apply the criteria of the object in the same group for the active participation of workers - Analyze career goals - Mobilizing external resources - Many opportunities for career development

Many other researchers have been interested in dividing the main purpose of the study of Human Resources Management into two main sections: the planning aspect and the change aspect [12]. Figure 1 shows the main aspects of HRM.
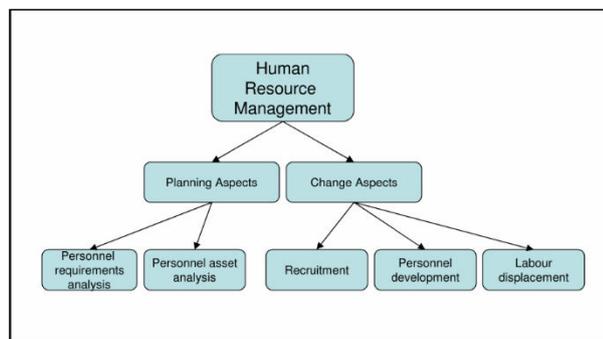

Figure 1 HRM main aspects [12]

2.2 Human Resources Management Functions

There are many functions that can be carried out by a Human Resources Management system through its direct impact on the overall organization performance as has been mentioned by many researchers. The importance of these roles became apparent through the pursuit of permanent organizations to develop their performance in order to achieve both a sustainable competitive advantage and organizational objectives [13]. In general, Human Resources Management systems contain six major functions: recruitment processing, job analysis and design, performance management, training and development, employee relations, and payroll system. In the next sections, we provide brief descriptions about each of these functions. Figure 2 shows the levels of the HR dimension.
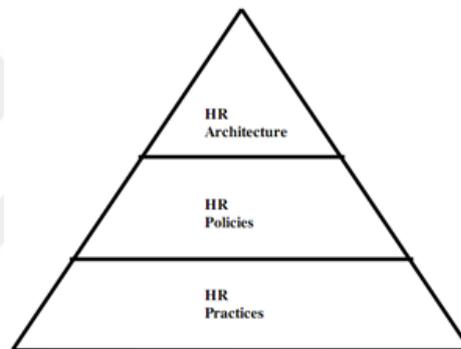
Figure 2 The levels of HR dimension [13]

2.2.1 Recruitment Process

Recruitment process management is one of the most important tasks carried out by a Human Resources Management System as this system contributes to raising the level of an organization's performance by enlisting new and efficient skilled workers [14]. This function can provide the possibility for the institution to make the best choice among applicants through a prefigured mechanism which includes abilities, skills, knowledge, and many other characteristics [15].

The main purpose of the administration of the recruitment process is to reduce costs, save time for both employees and employers, to have access to the largest possible number of applicants, to ensure transparent evaluation of processing through the

system, and to provide an easy environment for managers to conduct analyses and selection processes [16].

Most employers endeavor to find the best among a pool of applicants while job seekers want to acquire more information about companies, their work hours, incentives in addition to any detailed information about the requirements of a position. Many studies have shown that institutions that do not use an effective system in the recruitment department may lose many opportunities to recruit skilled workers, and consequently, lose much in the future [17].

Other studies have shown that companies relying on effective recruitment systems have grown steadily and rapidly, which has contributed to reducing costs, saving time, and gaining new experiences. This system has also helped to avoid many of the mistakes associated with the recruitment process, thus reducing the damage caused by the hiring of unqualified people [18].

2.2.2 Job Analysis and Design

Determining the need of an institution in terms of the labor process is also considered to be a background task in the management of human resources. This process includes an analysis of business requirements, the actual needs for a particular position and the concomitant duties of the position. Moreover, providing detailed information on a position is also an important part in this process [19].

A descriptive process for job design also contributes to helping managers to make an appropriate decision to hire. The job analysis and design process can provide information for a multiplicity of determinants, such as expansion criteria, shaping physical activity requirements and suitable salary and efficiency levels [20], There are two factors which must be taken into account in this process. The first is to determine the actual needs of the job within an institution, second one is quality and productivity of such achievement [16].

The effectiveness of the Human Resources Management system shows through to the actual need for a clear understanding of the job description by both employers and job seekers. This process also contributes effectively to determining the infrastructure needs by organizations to work efficiently in the near future [18]. In

addition to the amount of money to invest in a specific sector, the main objective behind this process is to improve an organization's functional and productive performance [21].

2.2.3 Performance Management

Developing performance is always related to the evolution of the functionality of both employers and individuals. This functionality is frequently used to ensure that the performance and functions of any task lead to achieving the goals of the organization in general [19]. Because of achieve such a goal, this process focuses on several issues, including the improvement and planning of a relatively higher-than-reflective performance assessment, which requires joint action from managers and employees in order to achieve these goals. Occasionally, a feedback system is use to boost confidence and improve the functions within a large enterprise and many studies have shown that the use of an effective management system functionality contributes effectively to the improvement of the level of performance in the short and long term in any organization [22]. Figure 3 shows the HRM to performance relationship [23].

| Human Resource Management | → | Employee Outcomes | → | Operational Outcomes | → | Firm Level Outcomes |

Figure 3 The HRM to performance relationship [23]
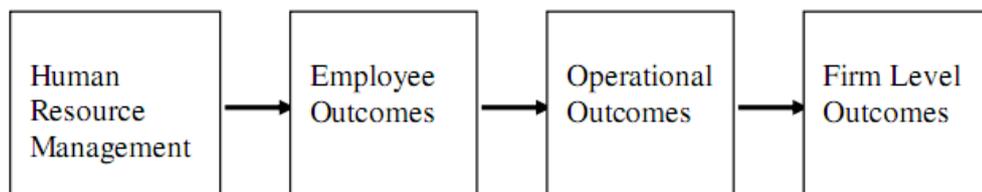
2.2.4 Training and Development

The organization and management of the training process is not an easy process as some might expect. It is, in truth, a complex process that reflects the interests of the employers in the development of their own employees' capacity, who then take advantage of these capabilities and skills acquired in favor of the Corporation [24].

Effective management of the training process contributes significantly to reducing costs and quantification time in production, development and performance.

As a result, the value of an organization itself increases, moreover, the provision of training systems for employees contributes to gaining their loyalty to the company, and increases the productivity they have, where they have a greater sense of responsibility towards employers [25]. Any investment in the development process and its process is expensive, especially in large establishments. Here, we can notice the importance of effective management of the training process and the actual need for this process in terms of reducing costs and increasing efficiency [26].

2.2.5 Employee Relations

The relationship between staff affects the success or failure of any institution. Moreover, good relations among employees contribute to gaining a competitive advantage for a firm in relation to its competitors [16]. Many studies have focused on the study of this aspect as part of a successful management perspective. A number of academics have succeeded in proving the existence of an effective relationship between the presence of close working relationships and goodwill among employees and the level of job performance [27].

Other studies have shown that workers who find a friendly environment at work are the least willing to leave this environment as they are the most productive and effective in their performance and doing their duties [19]. The presence of close and functional relationships among employees contributes effectively to the possibility of success in their work within a joint team.

Therefore, it is obvious that most companies make great efforts to maintain a continuous condition of friendly relations among their workers because of its significant impact on the performance upgrades and reduction of problems that affect the conduct of business [27]. Effective management systems for Human Resources as part of this process contribute significantly to the development, success and maintenance of these relations.

2.2.6 Payroll System

The payroll system, or payment system, is one of the most important pillars of a Human Resources Management System due to its great importance in determining the salaries of staff and payment methods for them as well as the organization of this process along with employee taxes [28]. In addition, the effective management of the payments system contributes to the drawing of strategic plans for the company. From time to time, a mechanism of incentives contributes to raising the level of production and creativity among workers [19]. A number of studies have pointed out the close relationship between payment of these incentives, high salaries and the productivity of the individual [12]. Other studies have shown a high level of satisfaction among workers who believe they are receiving what they deserve from their work or they feel is sufficiently fair regarding the level of services offered to them as they are employees within the framework within a particular job (Kramar, 2008). A successful payments system administration certainly contributes to raising a company's input to the maximum available limit [22].

Actually, HRM include and not limited to above six functions, while there are another important functions part inside HRM , called Human Resources Information Systems (HRIS) [29], which will be explained in next section.

2.3 Human Resources Information Systems (HRIS)

There is a close relationship between the developments of information systems. The Human Resources Management information systems can be defined as *"study of information systems and their development is, a multi-disciplinary subject and addresses the range of strategic, managerial and operational activities involved in the gathering, processing, storing, distributing, use of information, and its associated technologies in society and organizations"* [29] . Another definition for information systems can be stated thus: *"HRIS is distinct in that it examines more than just the technological systems, or just the social systems, or even the two side by side; in addition it investigates the phenomena that emerge when the two interact"* [29]. Therefore, the evolution of information systems has helped in the emergence of a

new term: Human Resources Information System (HRIS). Since the beginning of its emergence, there have been many attempts to make a precise definition of this concept. The first attempts were made by Walker in 1982 [30], wherein he states that *"[t]he modern Human Resources Information System may be defined as a computer-based method for collecting, storing, maintaining, retrieving, and validating certain data needed by an organization about its employees, applicants, and former employees."* Figure 4 shows the main functions of information systems.
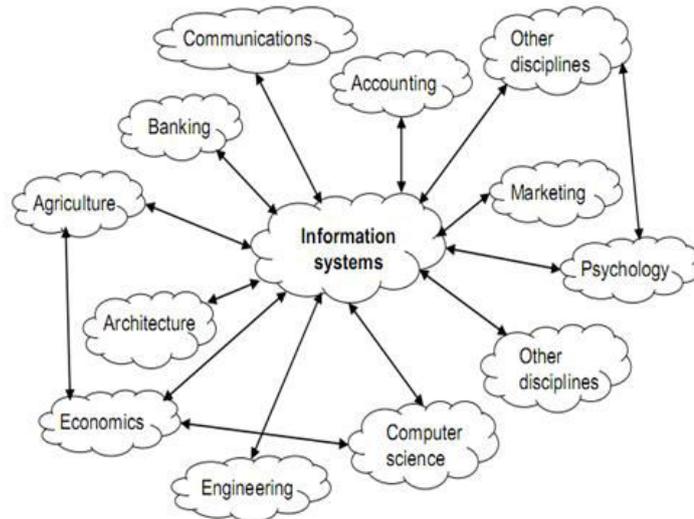
Figure 4 The main functions of information systems [30]

Tannenbaum (1990) states that *"a Human Resources Information System is a system used to acquire, store, manipulate, analyze, retrieve, and distribute pertinent information about an organization's human resources."* Moreover, Kovach & Cathcart, Jr., (1999) define HRIS as *"a Human Resources Information System [that] is a systematic procedure for collecting, storing, maintaining, retrieving, and validating data needed by an organization about its human resources, personnel activities, and organization unit characteristics."* [31].

Through these definitions, we can conclude that HRIS emphasizes the technical accomplishments of the data process within HRIS systems have several characteristics, such as being the subsidiary of the overall organization of the information system, storing, retrieving and saving data in the interests of maximizing human performance in a database designed for this purpose. The system is interested in providing information on human resources and the rationalization of the process [16].

2.3.1 Importance of HRIS

It is known that an organization as a whole consists of several systems: a human resources information system, a production system as well as financial, marketing, storage and supply systems. These systems work together to achieve an organization's goals. As the Human Resources Information System is a "sub" of the overall information system for the organization, it is required for coordination and integration with legacy systems; therefore, it is the essential foundation for other systems in the organization [32], for the following reasons:

1. A Human Resources Information System can manage other departments to obtain complete and accurate information on personnel and those who are considered a resource, regardless of the organization's resources, which cannot do without it;

2. It can identify the needs and desires of individuals in an organization and work to meet those needs and desires in line with increased motivation and productivity;

3. Help the organization to channel human resources optimally towards achieving a competitive advantage; and

4. The system can achieve a good relationship and mutual understanding between management and employees by providing a variety of information about the activities of workers, and most importantly, performance evaluations of workers in terms of management becoming aware of what workers are doing.

2.4 HRIS Adoption

In the age of globalization, reliability of information systems has increased. This reliability makes the management process for information systems one of the complex processes that consume much time and effort. Many attempts have been made to invent newer and cleverer ways to manage this vast amount of information. From here we trump the importance of managing human resources information system, which endeavors to organize employee information in any institution [33], Figure 5 shows HRIS adoption.
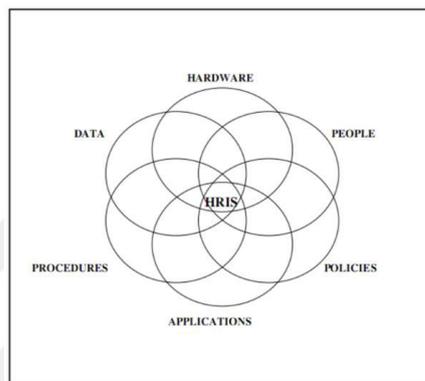

Figure 5 HRIS adoption [33]

Many studies have shown a direct relationship between infrastructure development of information technologies and an increased reliability in a HRIS in many establishments. A HRIS has a wide range of uses as it enables complex controls and tasks over operations and gives the ability to perform these simply and easily. Other studies discuss the importance of increasing the reliability of these systems in terms of the evolution of the global economy [4].

2.5 Strategic Human Resources Management (SHRM)

The importance of Human Resources Management within an enterprise came from the ability of this system to make a logical integration between operations and planning, as previously mentioned. Strategic Human Resources Management (SHRM), as a term, was described by Schuler et al. (2001) [34], which explained the evolution of Strategic Human Resources Management (SHRM) in two phases. The

first phase of the evolution was a transformation from personnel management to Traditional Human Resources Management (THRM), and the second phase was a transformation from Traditional Human Resources Management (THRM) to Strategic Human Resources Management (SHRM).

In order to advance organization performance and gain a competitive advantage, many researchers explain that the focus on Human Resources Management must bring the attention to other priorities. These priorities should focus on the business sector and the development of the strategic plans of a corporation. More than being priorities accustomed to a HR system management only, new priorities need to include flexible workforces, designs of a team-based job, employee empowerment, incentive compensation, and quality improvement practices [35]. During this time, Strategic Human Resources Management (SHRM) was intended to identify the main organizational strategic requirements and any deliberate capacity development, which is compulsory to implement a modest strategy and accomplish active objectives. From here increased the interest in studying SHRM.

So far there is no clear definition for Strategic Human Resources Management. A number of researchers describe it as processes of HRM, while others such as Wright and Snell (1991) [36], which describe it as an outcome. They described SHRM as a process when they state that they are *"organizational systems designed to achieve sustainable competitive advantages through people."* McMahan (1992) [37], described SHRM as *"the pattern of planned HR deployments and activities intended to enable a firm to achieve its goals."*

Moreover, D. Ulrich (1997) [38] defined Strategic Human Resources Management as the relationship of HRM strategy and functions with objectives and organizational goals in order to cultivate and advance an organizational culture and industry performance that increases invention and tractability.

Other academic researchers, such as Torrington et al. (2005) [39], have stated that Strategic Human Resources Management to be resources that are compliant with the HRM role as a strategic partner in the preparation of a corporation's policies, as well as in the operation of each individual approach over HRM's accomplishments, such as selecting, recruiting, rewarding personnel and training. Moreover, most

researchers agree that Strategic Human Resources Management is the best practice of HRM. They formulated a theory of Strategic Human Resources Management that was grounded on four HR policy goals, namely *commitment*, *strategic intentions*, *quality* and *flexibility* [39].

1. Commitment: confirming that workers' impressions are inevitable to the association, and make an exceptional performance.
2. Strategic intention: Confirming that HRM is fully combined into strategic development by permitting intelligible HRM rules, which allows line directors to use HRM and forms as a portion of the day-to-day work.
3. Quality: Permitting an elevation in superiority of services and goods over high quality and flexible workers.
4. Flexibility: Permitting flexible associations and construction as well as flexible function based on numerous services.

Other researchers, such as Ghoshal et al. (2002) [40], state that the character of HRM has developed to be strategic in structure rather than being supportive by using capital that is more human in order to ensure a competitive advantage among many other competitors. Additionally, Lint et al. (2005) [41], state that HRM has been moving from being a selective and supportive process to one of having a strategic role in general. Figure 6 shows the supportive roles of HR and strategic plan transformation.
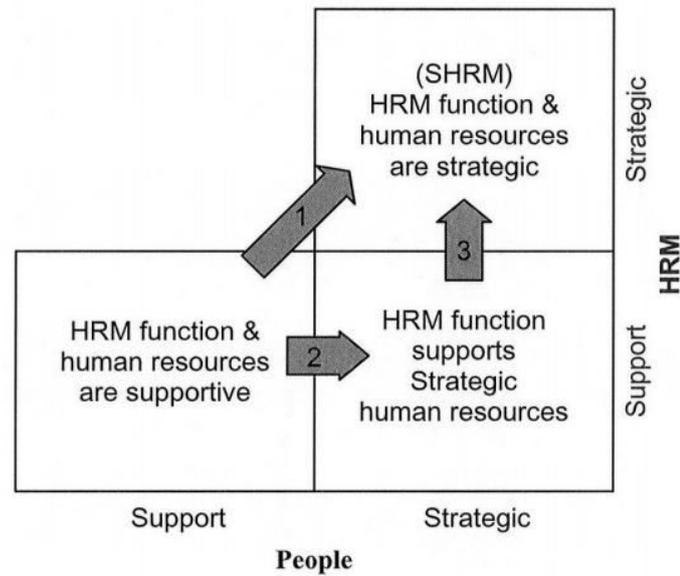
Figure 6 The supportive roles of HR and strategic plan transformation [41]

In conclusion, Strategic Human Resources Management (SHRM) can be considered to be the amount of contribution a corporation plays by HR sections and the fundamental decisions made within the same organization. This involves both implementing and designing policies and practices in order to achieve organizational objectives and to ensure that human capital also contributes to achieving industry objectives [40].

2.6 SHRM Dimensions

Many academic researchers have identified four key factors that relate to SHRM [40]:

    1. Strategic Human Resources Management and leadership;

    2. Strategic Human Resources Management and re-engineering;

    3. Strategic Human Resources Management and employment unions; and

    4. Strategic Human Resources Management and workplace knowledge.

2.6.1 Strategic Human Resources Management and Leadership

The concept of Strategic Human Resources Management and leadership can be defined as the construct of social control leadership structures that permeates the practice of work organizations and theory, or how SHRM is known today. Common leadership models are supported for employees away from the financial contract; therefore, the transformational lead can authorize labor. Nevertheless, such management models change the emphasis of the administrative controller procedure and distinctive power relative to the individualization of the employment relationship and the psychological agreement [42].

2.6.2 Strategic Human Resources Management and Re-engineering

Organizational structure is one of the most important processes that must be given great attention by managers. This process is commonly known as high-commitment management, business process re-engineering, or high-performing work systems. The concept has been used in organizational management and organizational design wherein the overall objective is to make maximum use of the available resources in order to achieve organizational goals [42].

2.6.3 Strategic Human Resources Management and Employment Unions

As it has been previously note that the relations between employees are consider as an important factor in the success of any business. In today's world, many labor unions work on the collection of workers from various sectors under one union.
The employee may also be registered in more than one union depending on the nature of his specialty. These unions also have an independent management and this may pose a risk to the business if the union decides to strike. Therefore, the development of a clear strategy by administrators to deal with workers' unions, and the development of close relations between workers themselves, significantly contribute to overcoming many crises [41].

2.6.4 Strategic Human Resources Management and Workplace Knowledge

The experience gained from the staff through work is considered to be one of the most important pillars in the success of any organization. It is a guarantee for an organization to keep itself at the forefront of business; this includes learning both formally and informally from its workers [42]. Naturally, the foundation has contributed much to the development of the expertise of their own employees through the availability of a suitable work environment and work on various projects in addition to many programs that may be received from workers through the company itself. The loss of an employee who has received a high level of training and has many years of experience is considered to be a non-compensable loss [23]. Therefore, it is important for any company to organize a clear strategy for a so-called transfer of expertise program, or a transfer of knowledge program. These programs must be easy to include the transfer of expertise gained from qualified staff to new employees in the form of training hours or putting new employees together with skilled workers in the same workplace so as to gain experience and renew the old ones [27].

2.7 Chapter Summary

Throughout this chapter, we have been exposed to the overall concepts that are related to our subject. We have gone through an overview of Human Resources Management (HRM) and the stages of development of HRM. In addition, we overviewed the strategies for the development of HRM. We also discussed the functions of Human Resources Management, including recruitment processing, job analysis and design, performance management, training and development, employee relations, and the payroll system. In addition to introducing Human Resources Information Systems (HRIS) we expounded upon the importance of HRISs and the adoption of HRISs. Furthermore, we discussed the concept of Strategic Human Resources Management (SHRM) and how HRM transforms from Traditional Human Resources Management (THRM) to Strategic Human Resources Management (SHRM). Finally, we provided an overview the dimensions of SHRM.

CHAPTER 3

LITERATURE REVIEW

3.1 Introduction

In this chapter, we will examine previous research and related work regarding the implementation of both a Human Resources Management (HRM) and a Human Resources Information System (HRIS). Moreover, we will review the system analysis requirements and specifications of the premise of this system in addition to a discussion of the expected benefits of using a Human Resources Information System. Finally, we will review the most important challenges faced in the implementation of such systems.

3.2 Current Research of Human Resources Management

There have been many previous studies that are related to the subject of this study. We divided the studies into two groups: Human Resources Management (HRM) studies and Human Resources Information Systems (HRIS).

3.2.1 Human Resources Management (HRM) Studies

Liu, et al. (2007) [43] studied the *"Human Resources Management Based on the Sustainable Development of the Enterprise."* Through this study, they attempted to provide organizations with many strategies in how to develop Human Resources Management. In addition, they discuss the sustainable development of Human Resources Management and how this can affect the overall performance of an organization. This study suggested an inspection system for best practices. Figure 7 shows the suggested HRM inspection system by Liu, et al. (2007) [43].

The module of the connected analysis includes a model of the Agricultural Technology Management Agency (ATMA), a model of an Artificial Neural Network (ANN), a model of Architecture Theory Criticism (ATCH), which computes as a
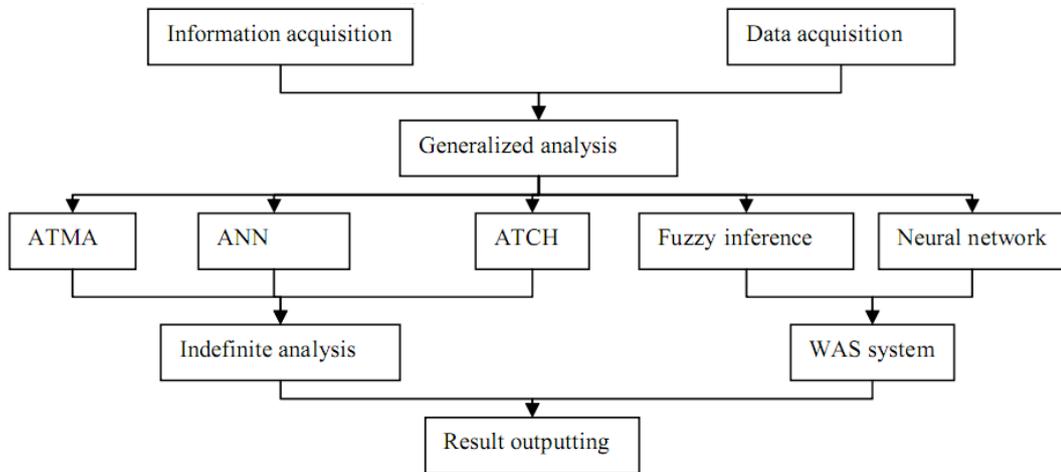
consequence of the evolution of HRM from the associated samples agreeing to the relativity.

Figure 7 HRM inspection system [43]

Xin Ma (2010) [44], in his *"A Framework of E-HRM Information Systems in Fashion Enterprise,"* discusses how the impact of rapid changes that occur in a fashion enterprise can affect a HRM system. As the result of global economic environments, the study provides some recommendations for the development of strategic HRM information systems in a fashion enterprise.

Feng An. et al. (2012) [45], produced the study *"Human Resources Management in Enterprise Based on the View of Innovation."* This study discussed the importance of innovation in HRM. In addition, they discussed the important of finding creative, intelligent, scalable and adaptive solutions for HRM systems, while De Cieri, H., & Kramar, R. [19]. Discussed several proposals concerning the development of optimizing the Human Resources Management process. The study concluded with suggestions for improving the performance of Human Resources Management in order to reduce costs and to increase the effectiveness of HRM.

Xiaoli Wen (2013) [46], discusses the challenges and obstacles facing the work of HR systems in emerging economies, such as in Chinese organizations in addition to

the importance of the success of these systems. This study made a number of recommendations for enhancing the effectiveness of e-HRM systems in Chinese organizations.

Xu Long et al. (2014) [47], in their study *"Impact of the Fitness between Business Strategy and HRM System on Sustained Competitive Advantage"* discuss how adaptive HRM systems can affect corporation performance. The research data were obtained from 263 companies in China, and the research shows the importance of adjusting an adaptive HRM system in order to gain a competitive advantage for a corporation.

Kittivaraporn, J. et al. (2015) [48], proposed an electronic portal for a Human Resources Management system by using an advanced communication network and web portal concept. The proposed project has succeeded in providing integrated Human Resources Management based on two principles, namely dynamic and responsive web design.

3.2.2 Human Resources Information Systems (HRIS) Studies

Razali bin, (2009) [49], researched *"The Reactions of Employees towards the Implementation of Human Resources Information Systems (HRIS) as a Planned Change Program: A Case Study."* This study was designed to understand what factors help workers to understand and accept a new Human Resources Information system being implemented. Additionally, they administered a questionnaire to 250 employees at Malaysia Airlines. The study aimed to find what factor would enhance individual performance for successful management of a Human Resources Information system. Hui Qin and Tang Jing (2010) [50], researched in *"HRIS application analysis based on ERP platform"* that selected a Human Resources Management (HRM) that was regularly disregarded by enterprise resource planning systems. Through this study, they explored the application of a Human Resources Information System (HRIS) in an enterprise resource planning system environment. They studied problems within the Enterprise Resource Planning (ERP) system and Human Resources (HR) system and suggested a new design idea for both ERP and

HR systems. Figure 8 shows the suggested idea for both enterprise resource planning and Human Resources Management systems.
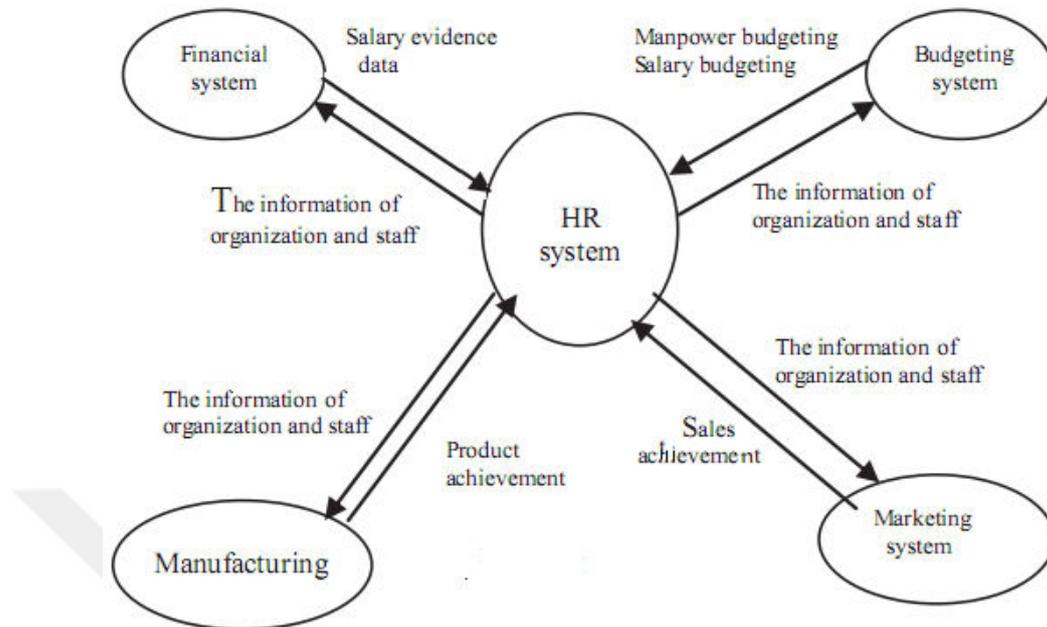

Figure 8 The suggested idea for both ERP and HR systems [50]

Zhang Jian and Zhang Yuhua (2010) [51], in their study *"HRIS Outsourcing of Information-based Starting Business,"* primarily present the feasibility and welfare of a Human Resources Information System (HRIS) in an information-founded enterprise. They show how we can contrive outsourcing solutions rationally and systematically, taking into consideration the advantages and disadvantages of analysis. This study resulted in a number of valuable recommendations in improving the outsourcing quality of Human Resources Information Systems.

Mohamad Noor (2011) [52], in his study *"Human Resources Information Systems (HRIS) for Military Domain – A Conceptual Framework"* discusses the most important factors that contribute to the success of the Human Resources Information System in the military sector. In addition, he suggested a new Human Resources Information system (HRIS) framework. This new framework can integrate three significant fundamentals in the military, such as products, people, and the process, and it shows how this type of framework can help in the implementation and support of military HRISs. They also administered a questionnaire to discover the success and obstacles facing the activation of these systems. The data were analyzed by using

a qualitative method. However, this, unfortunately, did not provide any type of prototype to test the overall system performance or system reliability.

Ashkan Davarpanah et al. (2013) [53], in their *"Human Resources Information Systems (HRIS) Success Factors in a Public Higher Education Institution Context,"* attempted to define the reliability and validity of using Human Resources Information Systems (HRIS), and stated the success factors of such systems in a higher education situation. The results show that many factors can affect the success of HRIS in an institute, including system quality, information quality, service quality, user satisfaction and system structural assurance.

Omar Tariq et al. (2014) [54], in their study *"Research on Human Resources Information Systems Based on Requirement Engineering,"* consider a Human Resources Information System (HRIS) as a case study for which a software system has been developed. They take requirement engineering as an approaches, such that requirement engineering involves an amount of processing to collect the requirements that depend on stakeholders' needs and user demands. Then they use it to make software product. In addition, they use requirement engineering to find the functional and non-functional requirements of a HRIS. Figure 9 shows system requirements by the engineering process.
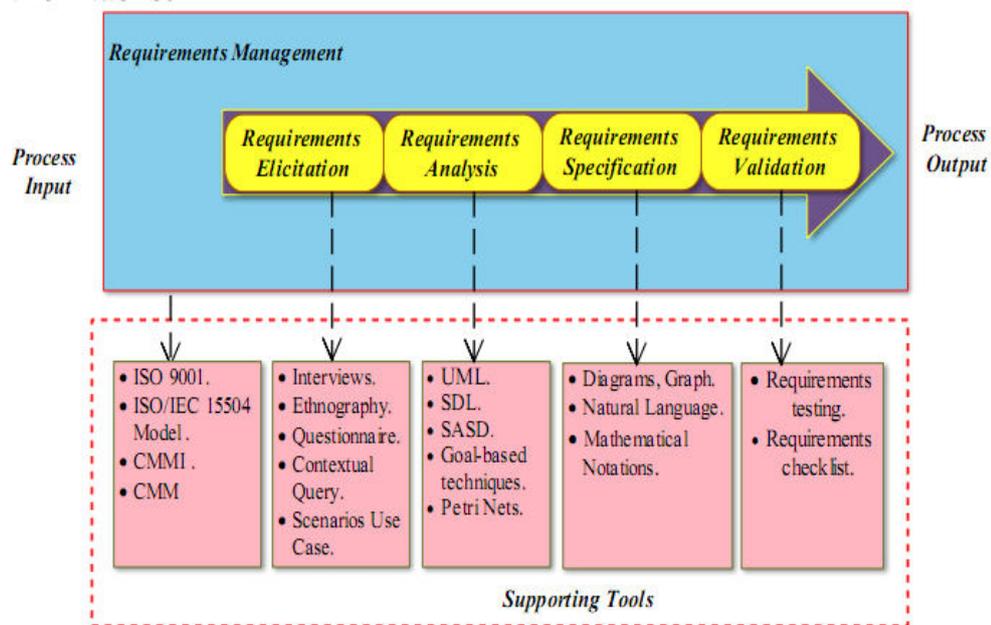

Figure 9 System requirements using the engineering process [54]

3.3 HRM System Requirement Analysis

The Human Resources Management system like any other system needs to analyze the requirements for a deeper understanding of the requirements of this system within these organizations. Therefore, the managers and employees should make a list of system requirements, including the following [16]:

1. Analysis of information relating to the company, such as the number of employees and the scope of business investment;
2. A review of the current system for the management of human resources within the institution and to identify the most important obstacles facing this system in an attempt to overcome the current weaknesses;
3. Financial and economic analyses of the benefits, costs and budgets required;
4. A shareholder analysis including a user's stockholder and end users;
5. A feasibility study for the project in practice;
6. Building clear goals and an action plan within a specific timeframe; and
7. Selecting the appropriate work environment that includes the type of operating system, the type of data base, and the type of programming language that will be used.

The success of the system analysis phase affects the remainder of the workflow, so the concern at this stage is an important step in the success of any future action [3]. This HRIS system should have many characteristics, which are as follows:

1. This system should collect, store, retrieve and save data to ensure maximum performance by using a database designed for this purpose;
2. This system should take care regarding all the multiple elements of staff, as well as planning, selection, promotion, transfers, wages, incentives and other activities; and
3. The system should provide information about workers and a rationalization of the process in order to improve decision-making.
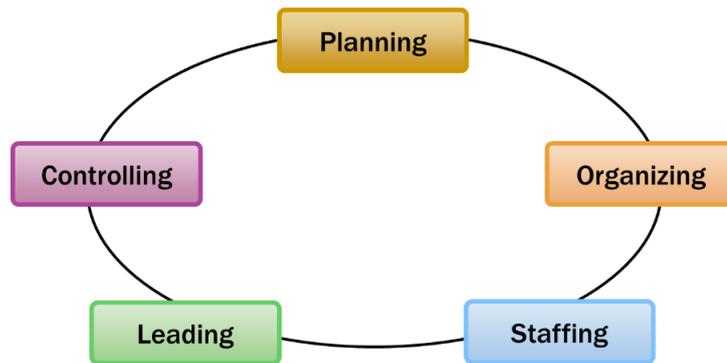
Figure 10 shows HRIS characteristics.

Figure 10 HRIS characteristics

Implementation of the Life Cycle for HRIS should concern the following:

1. Outlining the scoop and responses to the question, such as what will be shielded by this revision or this implementation;
2. Development and identification of the processer, such as when, who, what, and with what resources we should go through;
3. Implementation and case study selection, allocating resources for HRIS implementation, monitoring and controlling the process;
4. Following progress and taking corrective action; and
5. Closing, revision completion, testing and evaluation start.

3.4 HRIS: Expected Benefits

There are many benefits expected from the development of human resources information systems, including the following:

1. The minimization of the cost of using the old style of Human Resources Management;
2. High speed in searching and retrieving information and data with an ability to customize the search feature;
3. An increased reliability and dependability on information obtained in a timely manner;
4. A greater possibility of more accurate analysis to assist in decision-making;

5. The provision of more meaningful profession formation and more counselling at all levels of work;

6. The provision of comprehensive and accurate reports at each level of work and also for individual employees;

7. The provision of more transparency in using the system;

8. An improved ability to respond to environmental fluctuations;

9. The provision of the ability to access information from anywhere and anytime;

10. More security and high disaster recovery; and

11. Improved communication.

In general, we can put these benefits into three groups. The first is strategic management, which includes environmental scanning, and tracks quality and productivity improvements. The second is workforce planning and employment, which includes tracking promotions, transfers, hiring and termination rates, the maintenance of the required organizational form, and the printing of applicant flow and utilization reports. The third group is Human Resources Development, which includes Outlines of career path development, tracking, education, skills and training programs, registering employees in courses, and evaluating employee performance. Figure 11 shows the HRIS implementation process.
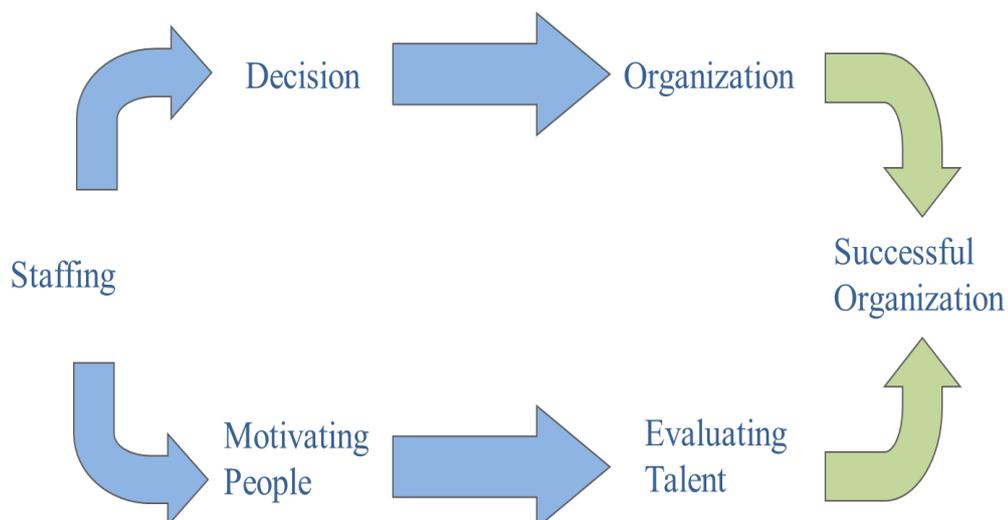

Figure 11 The HRIS implementation process

3.5 Research Challenges

There are many challenges that one may encounter to implement a Human Resources Information System (HRIS), including the following [16]:

1. Globalization: Matters relating to the nature of the system and the methods of its publication to include every employee within an organization;

2. Work culture or Work nature: This challenge pertains to the acceptance of the implementation of such a complex system in the work environment and what this might mean for workers;

3. Technological challenges: These are some of the most important factors that affect the success of HRIS systems, such as the availability of ICT infrastructure, the level of knowledge among workers in how to use such systems, and technical matters relating to the construction of HRIS systems and how to administrate them, as well as security concerns;

4. Workforce challenges: The number of, and the nature of, the employees of an organization and whether these workers are full-time or part time;

5. Economic challenges: The funds allocated for the implementation of this system, the amount of investment in the system, and the expected cost of the system; and

6. Deregulation challenges: These challenges include the senior management of the institution; whenever they accept the idea of changing the old system and accepting a new one. Figure 12 Summarizes HRIS challenges.

Figure 12 HRIS challenges

CHAPTER 4

COMPARISON AND DISCUSSION

4.1 Introduction

In this chapter, we will review the case study (University of Kirkuk) and the structure of the University. In addition, we will review the most important open source software that has been used in the construction of global Human Resources systems and we will make an effective comparison between them, including the identification of the most important advantages and weaknesses of each system. After the completion of this comparison, it will be easy for us to determine to propose the best system to fit the needs of the University of Kirkuk followed by customization of the system to meet the needs of the University of Kirkuk.

4.2 University of Kirkuk

The University of Kirkuk is a relatively modern university which was established at the beginning of 2003. During this time, it comprised only four faculties. Three faculties were established after the date of incorporation, namely the Faculty of Education, the Faculty of Science and the Faculty of Law. Since 2003, the university has been witnessing a gradual evolution to promote itself on a scientific level as well as to promote the level of the students and the research presented by studying students and teachers alike. The university is also keen to participate in the most scientific forums and conferences held at other universities within or outside the country. Moreover, it includes a level of urban and architectural development and upgrading services provided to staff and students [55].

The City of Kirkuk is geographically one of the important cities in Iraq. It has a strong oil economy. Moreover, it mediates Iraq, including many internal nationalities and ethnicities, such as Kurds, Turkmen, Arabs and Assyrians. Despite the small

geographical area allocated to the University at its time of incorporation, the University has succeeded in its enlargement process [55].

The University went through several stages of evolution, including the creation of new colleges. These new colleges include the Faculty of Medicine, Engineering and Agriculture. In 2007, the University opened the Faculty of Administration and Economics, and in 2010, the University has seen the expansion of, and additions to, its existing colleges including the Department of Mechanical Engineering to the Engineering College, and in 2011 the addition of the Department of Physics Science and Life Sciences. The University, in 2012, saw a significant scientific leap through the development of the Faculty of Veterinary Medicine and the Faculty of Physical Education [55]. The University also introduced graduate studies in most of its existing faculties.

All of these development operations that have been added to the departments within the university have contributed to the increasing number of students as well as the need for new development within the University, thereby bringing new technology. Moreover, it has become a far more urgent need than ever to develop the potential services of the University in order to provide better services for staff and students. Figure 13 shows the University of Kirkuk main campus.

Figure 13 University of Kirkuk main campus

The University has a large number of administrative buildings, such as the Presidency of the University building in addition to a building for each college within the University, numbering eleven buildings, and one building as dormitories for female students, and one for male students. The University also has fourteen

31

major buildings for students. Recently, two buildings were added to become sixteen buildings. Overall, the University of Kirkuk comprises upwards of thirty buildings. In addition, there are still other projects to expand the number of University buildings, many of which are under construction [55]. Today, the University includes the following departments: the Faculties of Medicine, Dentistry, Veterinary Medicine, Engineering, Science, Nursing, Law, Education, Administration, Economy, and Pure Sciences as well as the College of Agriculture. In addition, work is underway by the University administration to develop other faculties for the advancement of science in the country despite the financial and geographical challenges facing the development process.

4.3 University of Kirkuk Vision and Mission

The vision of the University of Kirkuk reflects the will of the management board of the University to convert the University of Kirkuk into a pioneering and distinct place that provides instruction services in addition to being an effective model for other Iraqi and regional universities. The University of Kirkuk's mission includes the following [55]:

1- The dissemination of science throughout society to provide technical and scientific expertise;
2- The preparation of specialized scientific cadres along with scientific testimony;
3- Achieving and developing relations with Iraqi and international universities.
4- The preparation of studies and a publication processes for various sectors;
5- A scientific advisory process;
6- Working to develop the energies of youth through the opening of training courses for them in various fields;
7- Laying the noble values of self-development among the youth; and
8- Preparing young people to lead the community in the future.

4.4 Structure of the University of Kirkuk

In general, the University of Kirkuk's carries out administration from the Presidency of the University, which is engaged in everything at the university. Furthermore, the University consists of a number of branch offices that distribute responsibility according to each office field. These offices include the following: an administrative assistant office, a scientific assistant office, a student assistant office, the office of the dormitories administration and the Secretariat of the Council of the League. Overall, the University of Kirkuk consists of 1520 employees and over 21,000 students [55]. Figure 14 shows the structure of the University of Kirkuk.

4.5 HRIS System for the University of Kirkuk

As we reviewed the importance of a Human Resources Information System for any organization in the previous chapters, and in order to build a specialized system in Human Resources Information Systems for the University of Kirkuk. We have actually different way to do that; first, we should select a suitable powerful database and programming language that can build suitable HRIS system for University of Kirkuk, and taking in account the difficulty of implementing of this method when it is need a large potential of systems analysis and programming capabilities in addition to the time factor and the physical cost for buying licenses required. This option apparently is not the perfect choice to serve the goals of this research.

The second option, which we found more logical, was to rely on open source software to set up an effective HRIS management system by taking the benefits offered by open source software and using it to serve the purposes of this research. Open source software can be defined as follows: *"Open-source software (OSS) is computer software with its source code made available with a license in which the copyright holder provides the rights to study, change, and distribute the software to anyone and for any purpose. [1] Open-source software may be developed in a collaborative public manner. Open-source software is the most prominent example of open-source development"* [56].
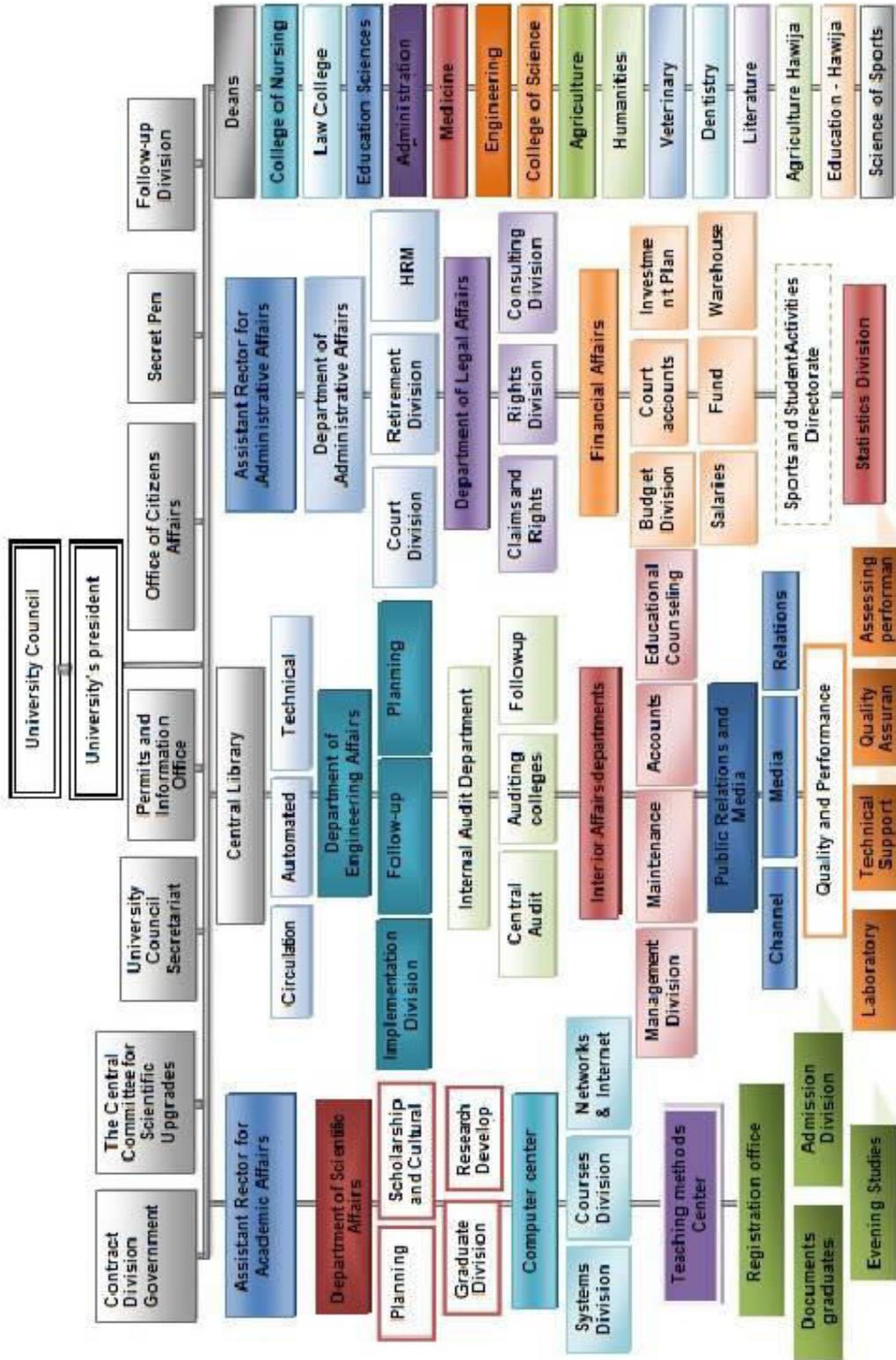
Figure 14 Structure of the University of Kirkuk

There are many reasons why choosing open source software is the good option for optimization and building a new system, including the following:

1- Flexibility: Open source software requires fewer resources to work, which means that this type of software can operate on older hardware;

2- Interoperability: Open source software can work properly with other types of software, which means that it offers higher integrity;

3- Auditability: Open source software can be easily audited due to the freedom of access to its source code;

4- Cost: There is no doubt that open source software provides the best option in terms of cost;

5- "Try before You Buy": This may be one of the main reasons we choose to work with open source software in this research. Because of this, open source software offers the possibility of experiencing and trying it over relatively long-term periods before deciding to purchase technical support or other services within the open source licensing agreement, or simply one can continue to work the software free of charge;

6- Quality: While proprietary software is created by a certain group of programmers, open source software is written by specialized groups scattered around the world and it is greatly supported by a community, which helps to set up high-quality programs; and

7- Customizability: Open source software offers highly flexible customizable functions to meet any requirement, which is rarely available with proprietary software.

The process of selecting open source software is not as easy as it appears. The process needs to be a real test in order to find the best solution and application that meets the requirements of an enterprise beneficiary. With this purpose in mind, in the next section, we will select a series of open source software packages customized to work as a HRIS, test each in a virtual environment and make comparisons between them in order to know the best functional software that serves our research goals.

4.5.1 Electronic Human Resources (A1 eHR)

Electronic Human Resources (A1 eHR) is a Human Resources Management system provided by [57], and is design to target the large and medium-sized enterprises market. This system offers many models within same package, such as organization management, a recruitment model, a leave management model, an employee relations model, a planning model, and a payroll system. The system is an open source application that is written in Java and uses the A1 Platform (a platform written by a cooperative company). Moreover, it uses the PostgreSQL database and it has many features, such as ease of use, high-speed information retrieval, and an extensible and cloud-ready application. Figure 15 shows the profile page.
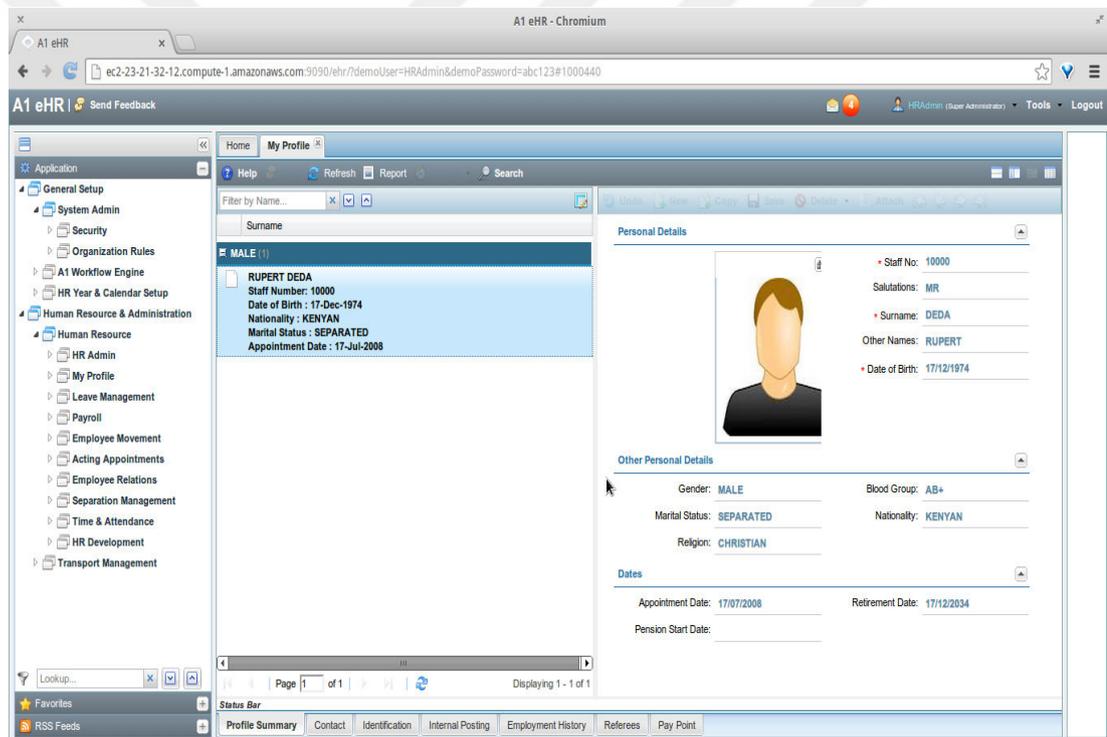
Figure 15 Profile page

4.5.2 Sentrifugo

The Sentrifugo system is considered to be one of the most important existing systems to be designed as a Human Resources Management system [58]. This is due to a wide range of electronic services offered by this software. It is designed as an open source system written in PHP and uses MySQL as a database. It is published under the GPL license and is powerful, gratis and considered to be a new age Human Resources Management system that can be effortlessly constructed to familiarize one to any administrative process. It has many features in one single package, such as the human resources management model, the performance appraisal model, the employee self-service model, powerful analytics tools, staff background checks ability, a leave management model, and a customizable service request. In addition, there are a cluster of features, including an interview schedule, easy use of the dashboard, feed forward, and time management. In fact, this system was designed for small and medium-sized enterprises and it has a streamlined HR process, and it is feature rich, intuitive and flexible to configure with an intuitive interface. Figure 16 shows the Sentrifugo system dashboard. This dashboard shows system-friendly interfaces.
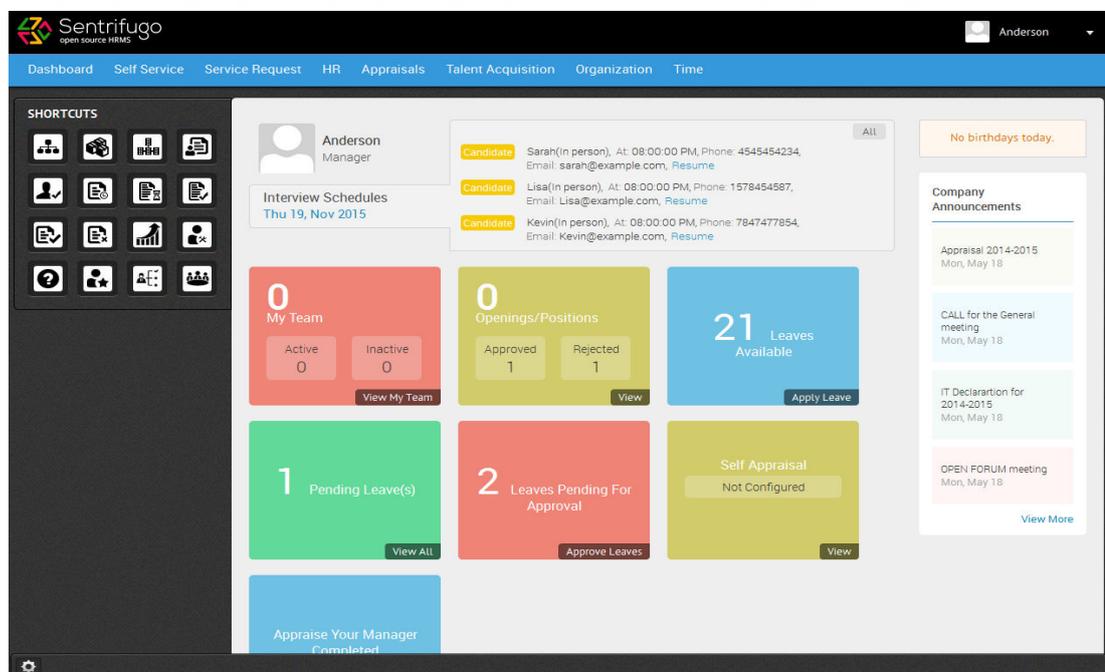
Figure 16 The sentrifugo system dashboard

4.5.3 Simple HRM

Simple HRM is an easy-to-use affordable open source Human Resources Management solution and intuitive system written in PHP and hosts MySQL Database. It has been published under an AGPL License since 2012 [59].

It targets the small and medium-sized enterprise market. It has several features, such as expense management, leave management, and employee information management in addition to many other features, including following, track staff information, simplify employee management, time management, and tasks management. It provides good reports and statistics.

It also supports Modular Based Design, Employee Self Service (ESS), and Manager Self Service (MSS) as well as organizational structure, centralized management of employee information, document management, employee dependency details, leave workflow, expense workflow, daily task reporting, company leave policy, and scheme, as well as the ability to manage multiple companies within the same organization. Figure 17 shows the Simple HRM welcome admin page.
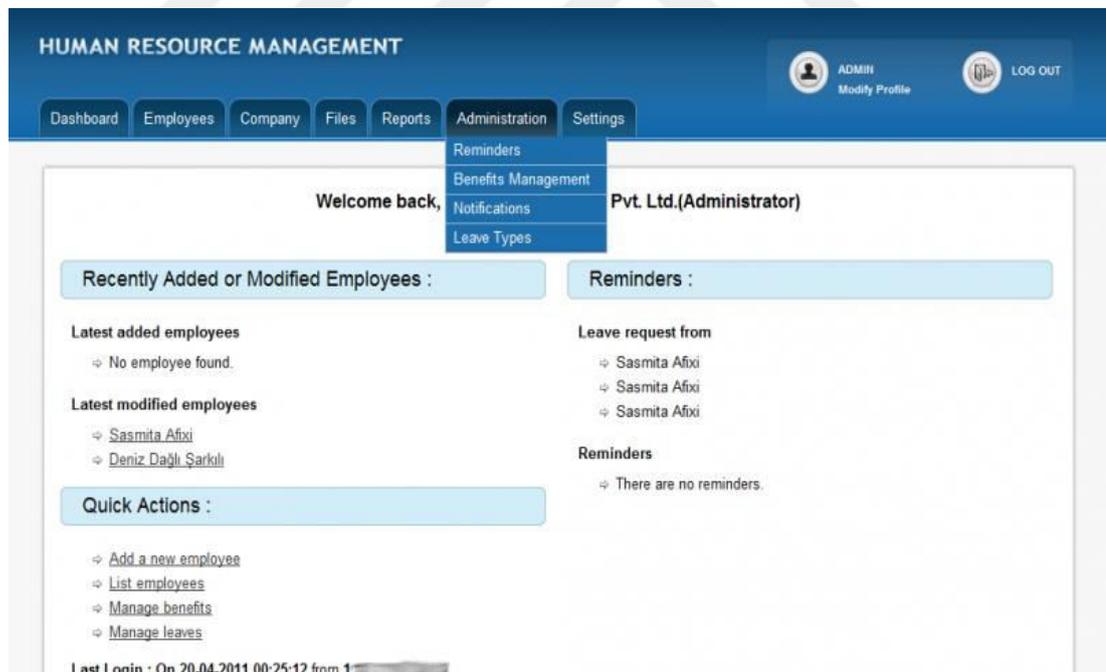
Figure 17 Simple HRM welcome admin page

4.5.4 OrangeHRM

OrangeHRM was published in 2005, and since then, it has been considered to be the most popular open source Human Resources Management (HRM) package which is intuitive, feature-rich, and robust. It has other versions, such as OrangeHRM Open Source (free of charge), OrangeHRM Professional and OrangeHRM Enterprise. This diversity gives OrangeHRM more affordability and more flexibility relative to other open source systems [60].

OrangeHRM is module-based architecture, which means one can take control over one's model and work with only what is needed. This model includes the following: Employee Self Service (ESS), Personal Information Management (PIM), leave management, performance evaluation and recruitment, and time and attendance tracking (PTO). In addition, it offers broad customization facilities to meet Human Resources Management requirements, and it supports a wide range of plugins [60]. OrangeHRM is built on top of Apache2, PHP and MySQL databases. Since its inception, millions of users and clients have used it as a powerful management system. It is also considered to be the best solution for every size of business, such as small, medium-sized and large enterprises.

4.5.5 Comparisons of the Open Source Software

The table below presents a detailed comparison between each system. The information obtained is provided after testing each system by initially configuring and hosting in a virtual environment. Tables 3-A, 3-B and 3-C show comparisons made between the systems in terms of general characteristics, full specifications and system functionality respectively.

Table 3-A General system comparison

	A1 eHR	Sentrifugo	Simple HRM	OrangeHRM
Published since	2012	2007	2012	2005
Language	Java	PHP	PHP	PHP
Operating Systems	Windows, Linux and MacOS	Windows, Linux and MacOS	Windows and Linux	Windows, Linux and MacOS
Database	PostgreSQL	MySQL	MySQL	MySQL
App-Server	J2EE	None	None	Apache Server
Web-Client	Yes	Yes	Yes	Yes
Multi Role	Yes	Yes	Yes	Yes
Multi-Tenant	Yes	No	Yes	Yes
Developed	Alliance Technologies	Sentrifugo Inc.	Viktor Nagorny	orangehrm.org.

Table above show general system comparison such as published date, OS used, App-server used, Web-client used, Database type and Development authors.

Table 3-B Specifications system comparison

	A1 eHR	Sentrifugo	Simple HRM	OrangeHRM
SaaS services (Live Cloud)	Yes	No	No	Yes
Multi Organization	Yes	No	Yes	Yes
User Profile Manager	Yes	No	Yes	Yes
Plugins Support	No	No	No	Yes
Administration Panel	Yes	Yes	Yes	Yes
Reporting	Yes	Yes	Yes	Yes
Email Notifications	Yes	No	Yes	Yes
Custom User Roles	No	No	Yes	Yes
comma separated values CSV Extraction	No	No	No	Yes
Personnel Informational Management	Yes	Yes	Yes	Yes
Multilingual	Limited	Limited	Limited	Yes
Flexibility	Limited	Limited	Limited	Yes
Employee Admin.	Limited	Limited	Limited	Yes
Retrieval System	Yes	Yes	Yes	Yes
Customize Work Flows	No	No	Yes	Yes
User Friendly	No	Yes	Limited	Yes
Document Manager	No	No	Yes	Yes
Leave/Time-Off Model	Yes	Yes	Yes	Yes
Electronic Signatures	No	No	No	Yes
Job Board Integration	Yes	Yes	Yes	Yes
Integrity	Limited	Limited	Limited	Yes
Credential Manager	No	No	No	Yes
Android & iOS API	No	No	No	Yes
Recruitment	Limited	Limited	Limited	Yes
Performance Monitor	Yes	Limited	Limited	Yes

Table above show specifications system comparison such as file type supported, plugins, look and feel retrieval system and many other features as shown above.

Table 3-C Functionality system comparison

	A1 eHR	Sentrifugo	Simple HRM	OrangeHRM
Customize Report	Yes	Limited	Limited	Yes
High-Performance	Yes	No	No	Yes
Stability	Yes	Yes	Limited	Yes
Filtering	No	No	No	Yes
Community Support	Limited	Limited	Limited	Yes
Online Capability	Yes	Yes	Yes	Yes
Disciplinary Tracking	No	No	No	Yes
Customize Lists	Limited	No	No	Yes
Customizable Look and Feel	Limited	Yes	Limited	Yes
Plug-in Support	Yes	No	No	Yes
Documentation	Limited	Yes	Limited	Yes

The above results present the experience of each system separately in a virtual environment, and it is obvious that the OrangeHRM system outperforms other systems in this comparison. Moreover, the unique possibility of this system allows long-term use and customization to fit business requirements without having to pay any remuneration. This will allow us to go over a unique experience through using this system, after which we move to additional services provided by the same software such as (Live cloud) for relatively little payment.

4.6 Lab Implementation

After reviewing the many studies on the related subject and after making comparisons between the best open source software, we visit and discussed the organization's structure process with the Human Resources Department at the University of Kirkuk, and in order to test and implement our HRIS system, we used VirtualBox tools as a virtual environment. Our lab component consisted of a main web server and one host machine. We used Linux Server Debian Linux 8, and we successfully configured OrangeHRM [60], inside it in order to meet our case study work criteria. Figure 18 shows our laboratory design, and Figure 19 shows our database main schema.
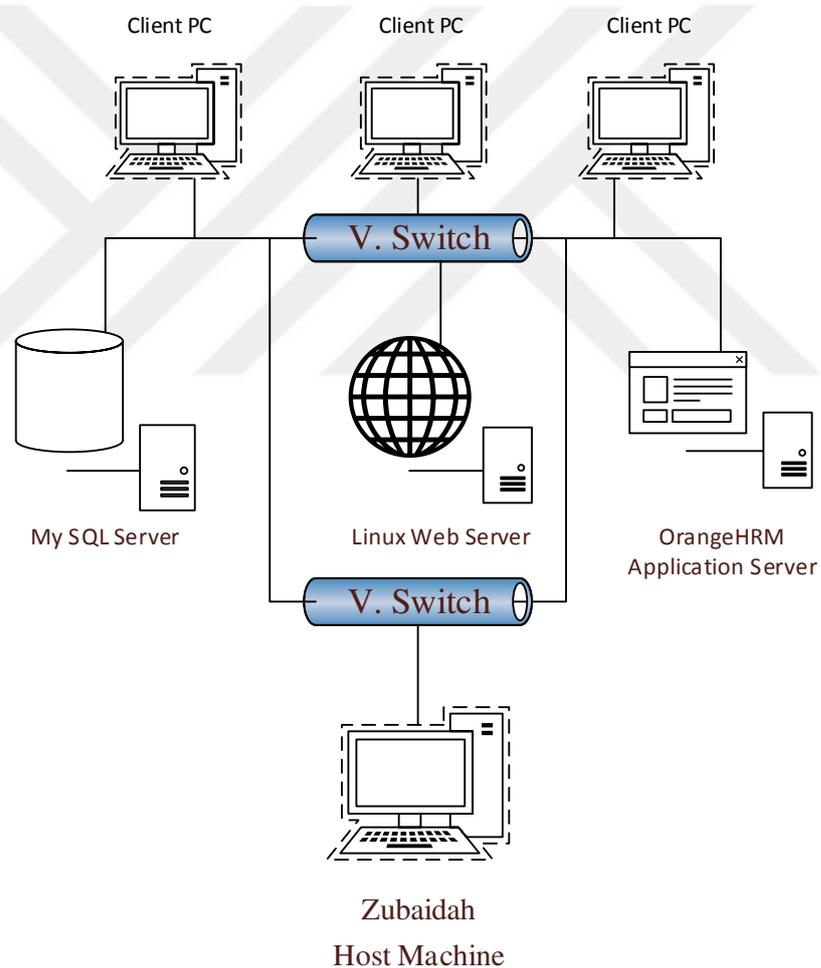
Figure 18 Laboratory design

Figure 19 Database main schema

4.7 System Component and Implementation Result

As the Human Resources Information System, it is natural that the remainder of the system consists of inputs, processes, outputs and feedback. Figure 20 shows system components and Figure 21 shows the main system login pages. Figure 22 shows the system admin pages.
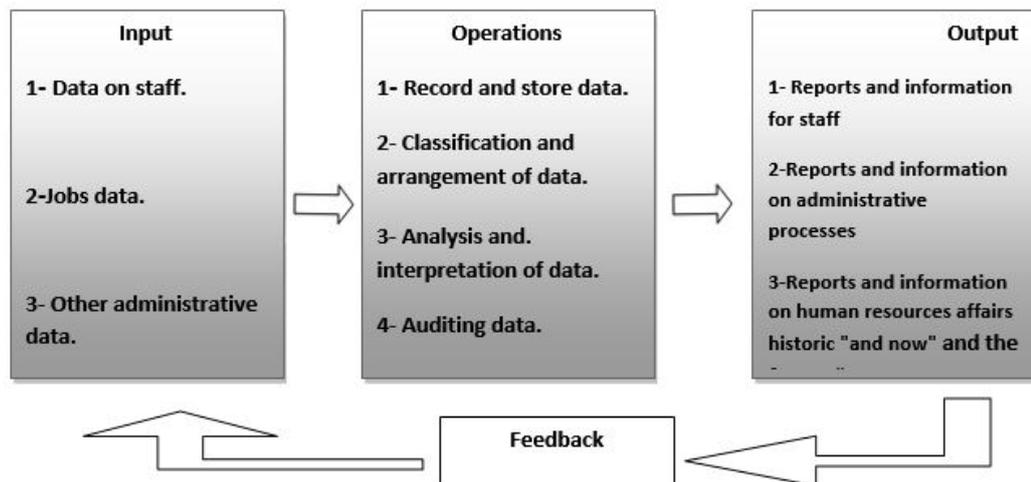

Figure 20 The components of the human resources information system
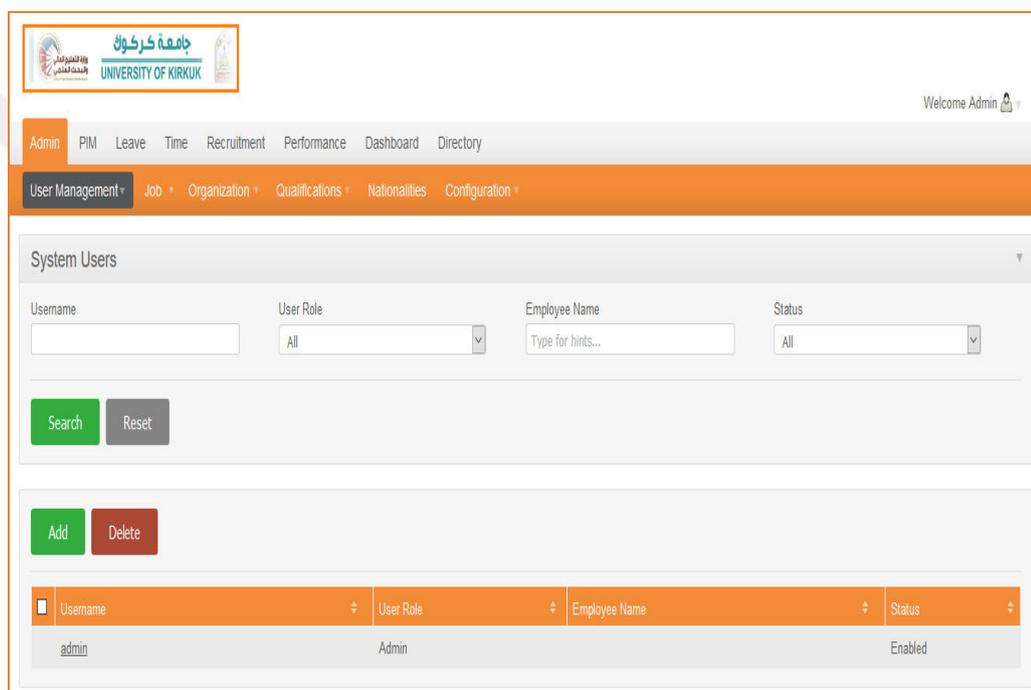
Figure 21 Main system login page

Figure 22 System admin page

Input : Represents the input data set for individuals working in the organization (such as data on the staff), employees' names, places and dates of birth, sex, religion, marital status, places of residence, scientific eligibility, functional degrees, experience, salaries and termination dates. Job details contain job titles, organizational positions and amendments thereto. Figure 23 shows the Employee Personal Information page.

Figure 23 Employee personal information page

In addition to administrative data, the system contains data related to employment policies, including laws and regulations and decisions related to human resources, salary components, emergency contacts, work experience, etc. The system allows an individual employee to extract and monitor his personal data, in separated page, data, such as competition and how organizations access people with experience, qualifications and salaries, cannot be edited by users without admin permission. Additionally, data relating to the preparation of programs and competencies which are currently available, and contacts can be edited by employees. Figure 24 shows the individual employee personal information page.

Figure 24 Individual employee personal information page

Operations: Operations denotes all the data that have been entered into the database of Human Resources through collection, storage and classification. The use of mathematical methods and statistical tests turns the data into information and reports that can be tapped. Figure 25 shows the system directory page.

Figure 25 System directory page

Outputs: These pertain to the reports, responses and information that reflect the findings of a system of results in the light of the inputs that have been made to the

database after processing. Information about staff and functions shows the movement of labor analyses for each department and functions of statistics. This helps to clarify the movement of labor in the organization in terms of recruitment, transportation, loans, delegation, and upgrades. Figure 26 shows a system sample report.

Figure 26 System sample report

Feedback: Information carrying messages and instructions on the functioning of the system and the extent to which output is matched with the plans and carried out through control over the previous element deviations in order to monitor and work to correct them and to serve the objectives of the organization. Figure 27 shows the performance review.

Figure 27 Performance review

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In this thesis, we have reviewed the importance of Human Resources Management (HRM), and the role and contribution of these systems in the development process of any establishment in terms of efficiency, cost and time management. We also reviewed Human Resources Information Systems (HRIS) and gave an understanding of the main differences between Human Resources Management Systems and Human Resources Information Systems. While HR systems are more comprehensive, Human Resources Information Systems (HRIS) are dedicated to achieving and serving any employee matter. This study intended to discover the importance of the Human Resources Information Management System and its importance to any organization.

In addition, we discussed the current research on Human Resources Management and Human Resources Information Systems (HRIS). We highlighted the most important expected evolution experienced by these systems through related work studies, and we discussed the research challenges. By selecting the University of Kirkuk as a case study, we revised the possibility of implementing a HRIS system there. In addition, we successfully suggested a HRIS system for the University of Kirkuk.

The suggestion system is based on a real test assessment made by using a virtual environment and the most common open source software devoted to HRM system. Our testing environment was grounded to functionality and performance of the system, and how it can meet our case study. Moreover we work through establishment a detail compression tables as well as implementing a candidate system to customize it to work as a HRIS system for our case study.

Testing and implementation results showed the following: the OrangeHRM open source software system could be used as a HRIS system for our case study due to the vast potential capability of this system. The University of Kirkuk can use this system free of charge; and there is the option of transition to the stage of adding services in different work stages for a relatively small fee. Moreover, it can be developed in the future to include a new facility. The test results showed that this system is scalable, malleable, flexible and interoperable for any future development.

5.2 Recommendations

The establishment of Human Resources Information Systems is not an easy task. Due to the complexities of traditional administrative systems and the different roles owned by different types of organizations, there are some recommendations that can be made for future work:

- Organizations should be subject to in-depth software analysis to find actual work requirements and match them with the possibilities that are offered by the system;
- Convince the public administration of organizations about the need to shift from a traditional system of administration to resources to the global system due to the great importance which is gained by using such systems – and attempting to break down the resistance to change;
- The creation of a dedicated team in an organization, who are specialists in the development of Human Resources Management Systems. Such teams should include both technical and administrative staff;
- The provision of appropriate ICT infrastructure due to the large amount of data used by these systems in medium-sized and large enterprises;
- Start using open-source software and adding services such as technical support in the future; and
- The allocation of sufficient financial resources for the development of Human Resources Management training programs. These programs may include specialized courses, awareness sessions and courses in risk management.

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APPENDIX

CURRICULUM VITAE

PERSONAL INFORMATION

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High School	Jelal Riza Efendi High Schools, Kirkuk, Iraq.	2000

WORK EXPERIENCE

Year	Place	Enrollment
2007	Scientific Assistant / Kirkuk University	Manager of the Office
2010	Identities / Kirkuk University	Technical Administrator

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Turkmen,Turkish, Arabic, English.

HOBBIES

Hiking and travel around the world.