Human Resources Management Improvement Using Enterprise Resource Planning in Public Sector Organization

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Abstract: This study investigates the improvement of human resources management (HRM) processes using Enterprise Resources Planning (ERP) systems in Public Sector Organizations. The rapid environmental changes led to increased demand for public sector organizations' ability to adapt quickly, which has changed the manual effort to technology-based processes, providing solutions focusing on integrating all functional areas to achieve goals for the entire organization. Studying the ERP system as an instance of a human resource information system with its all-essential components alongside its unique nature will provide a full picture of every aspect without missing any important information. Despite a huge repository of articles on ERP that is widely used across different industries in the private sector, further research is highly sought on ERP in the context of human resources management in the public sector. In this article, a modest framework is proposed to describe the HRM processes in relation to ERP systems in public sector organizations, based on a comprehensive literature review at the intersection of HRM processes, ERP, and Public Sector organizations. The study highlights the role and importance of ERP systems integrity in improving the HRM processes in Public Sector organizations.

1. Introduction

In public and nonprofit agencies, the greatest expenses and the greatest assets are employees (Pynes, 2009). In this modern era, the challenges of increased competition for skilled workers and constantly changing COVID safety protocols rapidly change how people work. The shift to remote work or the need to scale up teams quickly made manual and conventional human resource management obsolete. An organization needs to keep up with these changes otherwise, business priorities get delayed, employees feel frustrated and human resources teams will be overworked. This can drop productivity and the organization's culture will suffer, and that's true of both public and private sector employers. Employers are expected to keep pace with changes while attracting and retaining the right talent. To face these challenges, technology is one of the enablers to increase the performance of human resource management, for it can provide improvements in both efficiency and effectiveness.

The heart of the public sector is the sovereignty of governments ultimately controlled by politicians. For a national government, this sovereignty extends over a whole country, including its economy (Jones, 2010). Public sector organizations have a unique culture for they are based on strict rules imposed by the government. They also encounter numerous challenges due to their social responsibilities, complex legislation, and higher public expectations. Like their counterparts in the private sector, public sector organizations are facing staff shortages, unmet customer demands, employee stress and burnout, and increased resignations. Governments all over the world began to experiment with various forms of governmental reform, among these reforms is applying the basic management concepts in private sectors to the public sectors. The phrase "new public management" (NPM) is coined for this method of reform. New public management (NPM) is a reformation of the public sector to emulate the practices of the private sector to a significant degree. One of the reformations is through the Enterprise Resource Planning (ERP) system (Fernandez et al., 2017).

Despite a myriad range of articles on ERP that are widely used across different industries, further research on ERP in the context of human resources management in the public sector is needed at present ever-changing times, full of challenges. Thus, the objective of this article is to propose a modest framework to describe the HRM processes in relation to ERP systems in public sector organizations,

2. Literature Review

Enterprise Resource Planning (ERP) systems are enterprise-wide information systems that integrate and control the complete range of processes and functions, to provide a holistic view of the business from a single information and information technology (IT) architecture (Seres et al., 2019). ERP software is offered by a wide range of vendors that specialize in this segment. Among these vendors, the main ERP vendors are SAP, Microsoft, Lawson, Baan, J. D. Edwards, Oracle, and PeopleSoft. ERP software is highly configurable to accommodate the diverse needs of users across most sectors of the economy (Klaus et al., 2000). Klaus (2000) states that ERP software exists in three different forms: generic, pre-configured, and installed:
1. In its most comprehensive form, the software is generic, targets a range of industries, and must be configured before it can be used;

2. Packaged, pre-configured templates have been derived from the comprehensive software. These templates are tailored toward specific industry sectors (e.g., automotive, retail) or companies of a certain size (SME).
3. For most users, ERP software presents itself as the operational installation after the generic or pre-configured package has been individualized according to the firm's requirements on site.

The initial use of ERP was to serve the manufacturing company. However, due to the tremendous benefits gained from the utilization of ERP, the public sector has taken a big step by implementing this system in their organizations (Fernandez et al., 2017).

Most companies have four main functional areas of operation: Marketing and Sales (M/S), Supply Chain Management (SCM), Accounting and Finance (A/F), and Human Resources (HR). Many organizations have begun using the term human capital management (HCM) to describe the tasks associated with managing a company's workforce. (Monk E. & Wagner, 2012). Alhalboosi (2021) notes that "The main aim of implementing an ERP system is to manage and orchestrate all resources, information, and business processes from common data repositories (Devos et al. 2017)" and "Human resource management (HRM) focuses on planning, utilizing, and controlling employees to achieve organization objectives (Mehmood et al. 2011; Mondy and Martocchio 2016)."

The increasing demands for accountability made by the stakeholders of public and nonprofit organizations have focused greater attention on performance management. As a result, agencies have begun to reevaluate their performance management systems. Because employees are essential to the delivery of quality services, performance evaluation is a critical component of strategic human resources management (HRM) in public Human Resources Management for Public and Nonprofit Organizations and nonprofit agencies (Kulla &Sopiah, 2017). Al Mamun Rasal (2020) cited that "HRM is described as a deliberate and rational approach to the administration of an organization's key assets – the humans working there and jointly contribute to the fulfillment of its targets (Armstrong 2016)". The application of human resource management principles within the public sector displaced the traditional model of personnel administration; Also, the adoption of HRM paralleled the extensive public sector managerial restructuring and reform program (Brown, 2004). Without an effective human resources information system, managing the training, development, and certification needs of a company's employees can be both time-consuming and prone to error (Monk E. & Wagner, 2012). HRM practices can impact the behavior of employees (Esangbedo et al., 2021).

According to Al Mamun Rasal (2020), HRM supports the businesses in managing all the statistics related to HR electronically and helps the agency in managing personnel and organizational archives and information by using recording and analyzing them, such as worker handbooks, security procedures, and emergency evacuations (Johnson et al., 2016; Abbasia et al., 2016). Some sub-functions of HRM are:
1. Recruiting
2. Training
3. Selection
4. Compensation Management/Administration
5. Performance Appraisal

The public sector is a major contributor to the economic development of a country. Various measures have been taken by the government to improve the quality and accountability of government agencies and their members so as to provide better services while ensuring greater transparency in financial management (Fernandez & Ahmad, 2018). Nandi (2008) noted in previous research that "Management of information systems in public-sector organizations vary significantly from those of the private organizations (Bozeman et al., 1986, Bretschneider, 1990)". Pynes (2009) noted, "The public sector is composed of a variety of government organizations. Government agencies are owned and controlled by the people. The government is used to maintain a system of law, justice, and social organization. It protects individual rights and freedoms, provides security and stability, and provides direction for the nation. The government provides public goods, regulates certain industries and activities, and corrects problems that the markets create or are unable to address (Rainey, 2003)".

3. Research Methodology

This study was conducted by qualitative method, with a literature review approach. A literature review is a form of research that reviews, critiques, and synthesizes representative literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated (Torraco, 2005). Snyder (2019) notes that "Qualitative systematic review can be described as a method of comparing findings from qualitative studies (Grant & Booth, 2009)". Creating the literature review involves the stages of scanning, making notes, structuring the literature review, writing the literature review, and building a bibliography (Rowley & Slack, 2004). The basic steps and important choices involved in conducting a literature review will be suggested and discussed using four phases; (1) designing the review, (2) conducting the review, (3) analyzing, and (4) writing up the review (Snyder, 2019).

To assemble a sample of papers needed for our analysis, we conducted a search of published studies by using databases such as Scopus, Science Direct, Elsevier, and Google Scholar. In order to be included in our research, the paper needs to satisfy the following criteria:
1. Full Paper, written in English and published in an academic journal
2. The article contains one of the following phrases: "Human resources management", "Human resources", or "Human capital management" must appear in the title, abstract, or keywords.
3. Contain one of the following phrases: "Government", "Public sector organization", "Public sector", "Public institution", or "Public service" must appear in the title, abstract, or keywords.
4. Contain one of the following phrases: "ERP", "Enterprise Resource Planning", "ES", "Human Resources Information System", or "HRIS" must appear in the title, abstract, or keywords.
5. The article is deemed correlated to the topic based on reviewing the abstract and skimming the paper.

Our search ended up with a sample of 19 papers spanning the years 2017 through 2021. In analyzing papers in our sample, we followed the methodology for the literature review proposed by Snyder (2019) and Torraco (2005).

At phase 1: designing the review, the first question that should be asked is why this review should be conducted (Snyder, 2019). As stated before, public sector organization is in dire need of a reform due to rapid changes in managing personnel. The most viable solution to

these problems is by using technology to elevate effectiveness and efficiency in human resources management. Unfortunately, only few research is focusing on this particular specific topic. Thus, this research is aimed to give general bases for further research on the aforementioned theme. On Phase 2: conducting the review, the review is carried out by collecting article correlated with the topic, at the intersection of ERP, Human Resources Management and Public Sector Organization. Moving to Phase 3: analysis and Phase 4: writing the review, researcher formulate this Review Article as a catalyst for further Research.

4. Findings and Discussion

The remainder of this paper is structured in two sections, and then follows with the concluding remarks. Firstly, Section 4.1 will introduce the improvement of each HRM sub-function by implementing ERP System. Then, Section 4.2 will discuss the issues and challenges of ERP Implementation in Public Sector Organization.

4.1 HRM sub-function improvement using ERP in public sector organization

Al Mamun Rasal (2020) cited "Organizations put in force e-HRM structures to enhance and expand the HR functions to obtain the aggressive benefits of the organizations (Parry, 2011)". Alhalboosi (2021) noted that "In compatibility with strategic goals and policies, operational HRM practices are put forward in order to manage the related processes of job design, recruiting and selection, training, performance appraisal, and compensation (Hansen et al. 2017)". Strategic human resource management means formulating HR policies and practices that produce the employee competencies and behaviors the company needs to achieve its strategic goals. Being able to measure results is essential to this process. (Dessler, 2015). As an example of using metrics, many employers spend thousands of dollars (or more) recruiting employees without measuring which hiring source produces the best candidates. The sensible solution is to assess recruitment effectiveness using measures or metrics such as quality of new hires. Many employers do track and analyze such data with the help of computerized applicant tracking systems (ATS). Analyzing recruitment effectiveness using ATS software involves two steps:

First, decide how to measure the performance of new hires. For example, with Authoria's system, hiring managers input their evaluations of each new hire at the end of the employee's first 90 days (about 3 months), using a 1-to-5 scale.

Next, the applicant tracking system enables the employer to track the recruitment sources that correlate with superior hires. It may show, for instance, that new employees hired through employee referrals stay longer and work better than those from newspaper ads do.

Filing and keeping track of résumés and applications is also an ongoing challenge as well as keeping the applicant's data on a paper form means that retrieving the applicant's data and using it to evaluate candidates. A good information system allows human resources staff members to retrieve relevant employee information in a matter of seconds and to maintain proper controls so sensitive information is not compromised and privacy rules are not violated. An integrated information system is a key component in this process.

To make Human Resource Management and its related functions run more effectively ERP in form of e-HRM can performs a full-size function (Morris et al., 2009; Voermans and van Veldhoven, 2008) in achieving the organizational success (Al Mamun Rasal et al., 2020).

From the technological dimension, there are many benefits of ERP implementation in public sector organization on HRM Processes, namely data centralization, alignment of Human Resource Strategy, an information technology infrastructure and support to perform various HR sub-function.

There are barriers that public sector organizations need to overcome: role conflict, employee resistance and employee understanding of the implemented system. These barriers are a direct result of rapid changes in the working environment. The most direct approach to address this is training employees both on hard skills and soft skills. Training is also an investment to keep employee's development in accordance with the organization's needs.

Conventional training in public sector organization has many things to be desired of. For instance, the development of an employee is not based on data, but more from the manager's subjective viewpoint. An employee might be trained in a field that does not match said employee's interest or talent.

A training module in HRM ERP can benefit public sector organizations greatly. Present day ERP Software utilizes machine learning to predict what employees need to do next such as completing a course that will develop a newly required skill that helps employees stay engaged and productive no matter where they work. ERP modules such as oracle talent management helps employees learn, do their best work, and chart their own career paths and it gives business leaders the ability to acquire, develop and retain the right talent to get the job done.

The integrated information on skills and training also benefits the next sub-function of HRM processes in Public Sector Organization: selection. Conventional method in employee succession is based on manager's experience or subjective assessment on their employee. This method is prone to mistakes as it is not based on data and relies solely on manager's experience and skill to evaluate their subordinate. An ERP system can give a more objective approach. Artificial Intelligence recommends the best candidate based on how closely their profile matches the job description and the traits of successful employees for similar roles. Employees can also apply for open positions or short-term projects. This not only gives organizations precious insight as to who will be chosen to occupy a certain position, but also increases employee's morale, as decisions will be viewed as fair and unbiased.

As stated before, human resource management is an indispensable part of a public sector organization that has connections with the rest of the departments within the organization. Therefore, any change in the HRM will affect and cause further adjustments in the different departments. For instance, a pay raise or promotion will affect the accounting department. ERP will elevate extraordinary issues like managerial issues, which is the most challenging thing that organization faces in HRM (al Mamun Rasal et al., 2020). Juggling payroll, especially if the organization has offices in multiple locations, while trying to keep up with complex labor laws, local taxes, and financial regulations can be challenging. And for large public sector organizations, it's almost impossible to keep payroll accurate and manage employee expectations. A payroll sub-function in ERP for Human Resources Management enables efficient, compliant, and easy to configure payroll processing across the globe. An ERP links time labor and leave management with payroll, financial, and personnel data. This lets organizations align business strategy, reduce compliance risk and deploy their workforce with greater control even during times of drastic change.

The last sub-function we will discuss is Performance Appraisal. Public Sector Organization has a unique condition that it is ultimately controlled by politicians. This has both positive and negative effects, though the latter usually stand out and leave the quality and accountability of government agencies in a tight place. Conventional Performance Appraisal is commonly done merely to please stakeholder or follow suit a regulation. Al Mamun Rasal (2020) cited that "(public sector) Organizations are affected by external forces like political or government selections that require human aid managers to deal with external challenges (Smale and Heikkilä, 2009; Bondarouka and Heijdenb, 2009). Public establishments in growing international locations, political decisions have an impact on the implementation of ERP ranging from obstacles in getting budget from the government, effect on labor union and organizational capability to exchange in terms of platform or technological issues. The scarcity of accountable performance appraisal in public sector organization affects power recreation change and decision making.

An ERP system can provide a full suite of cloud-based Enterprise Performance Management applications to help public sector organization analyze, understand, and report employee performance. The integrated system means that managers can check performance of each division or individual employee based on their target achievement or peer review from a dashboard.

4.2 Issues and challenges of ERP Implementation in Public Sector Organization

The decision to adopt ERP should be considered accurately. Even though public sector organizations may not strive for financial improvements from ERP adoption, but because ERP system adoption requires a substantial amount of money and considerable number of human resources, failure to effectively implement and manage ERP can affect organization in many ways, ranging from stakeholder dissatisfaction to lawsuit and corruption charges.

The highest challenge is complexity of existing working structure (Fernandez & Ahmad, 2018). This includes protocols, bureaucracy in meeting ERP standard requirements. Followed suit is the challenge to change the way people work after ERP implementation. This barrier is more challenging in the public sector, where the disorganized and bureaucratic working structure and incongruent legacy systems have to be integrated in a new system environment. Lack of experience and appropriate skill and insufficient information and communication technologies infrastructure. The former occurs as a result of the absence of capacity to cope with the new system due to the lack of training while the latter due to the complexity of software functionality and lack of knowledge and experience, thus the best solution is to seek assistance from external consultants.

5. Conclusion

In this paper, HRM process improvement using ERP systems in public sector organizations are discussed. It is clearly revealed that integrity as the inherent trait of an ERP system is a critical issue to improve HRM processes. Requirement for implementing ERP systems is a better understanding of the likely challenges they may face and put in place appropriate measures to help in mitigating the risk of implementation failures. These challenges indicated that all public sector organizations are necessitated to do thorough analysis of their strengths and weaknesses before any decision to adopt ERP is taken.

This paper also has limitations. Due to the niche of the keyword used, the number of articles used as sample and reference is relatively small. Thus, future studies can highlight the benefits and various factors of HMR processes improvement in the public sector.

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