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## Utilisation of Software and Information Systems to Support Human Resource Planning

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**Abstract.** Technological change has transformed the way businesses operate in the digital age. Companies around the world face new challenges and opportunities as technology evolves. In this article, we will discuss the impact of technological change on companies and how companies can adapt through human resource (HR) planning. Software and information systems play an important role in managing HR, from data collection and analysis, planning and projecting HR needs, to performance management, recruitment, selection, and payroll. The utilisation of software and information systems brings benefits such as faster and more accurate decision-making, time and resource savings, as well as increased productivity and the ability to respond to market changes. However, there are also challenges such as data security, incompatibility with legacy systems, and required HR training. In overcoming these obstacles, organisations can take advantage of the flexibility, scalability and collaboration that information systems provide. With a good understanding of the challenges and opportunities, organisations can take proactive steps to effectively leverage technology in their people management.

**Keywords:** Technology; Information Systems; Human Resource Planning

## A. INTRODUCTION

Technological change has become a major driving force in business transformation in the modern era. In the ever-evolving digital age, companies around the world are facing new demands and opportunities that emerge along with technological developments. The digital revolution has affected every aspect of a company's operations, from human resource management (HRM) to business strategy. The challenges faced by companies in the face of technological change are inevitable. These changes not only affect the way companies operate, but also how they interact with markets, customers and competitors. While these challenges are not always easy, technological change also brings great opportunities for companies that are willing to adapt and take initiative. Companies can capitalise on technological change to achieve success and increase their competitiveness in an ever-changing market.

In the development of information technology and software has brought about a significant transformation in the way organisations manage their human resources. Human Resources software and information systems today are no longer just administrative tools, but are also key in strategic decision-making and give organisations a competitive edge. The utilisation of software and information systems provides quick access to data, powerful analytics, and automation solutions, companies can better respond to changes in the market, identify emerging trends, and plan HR strategies accordingly. How the utilisation of software and information systems has changed the way companies plan their HR, with a focus on speed and accuracy of decision-making will be reviewed. The benefits resulting from the utilisation of these technologies, including increased productivity, operational efficiency, and the ability to respond quickly to market changes, will also be discussed.

In the era of society 5.0, in (Supriyati, Adriyan Radiansyah, 2023) employers must collaborate between information technology and human resource planning strategies. In this era, the challenges faced are rapid changes in the business environment and society, rapid technological developments and innovations that create unstable situations, such as changes in culture and consumer behaviour (Hysa et al., 2021).

Also highlighted will be case studies and best practices from various industries that have been successful in utilising software and information systems to achieve a competitive advantage in their HR planning. All this with the aim of providing deep insights into how technology can be a powerful partner in HR planning and generate decisions that help organisations achieve success in a rapidly changing business world.

## B. LITERATURE REVIEW

According to Sari (2021: 2), "Computer software is a set of electronic data, either in the form of programs or instructions that will execute a command, which is stored and managed by a computer". Meanwhile, according to Suparman (2023: 79), "computer software (software) is a collection of programs, data, and instructions used to operate a computer". So, software is a programme that runs on a computer and allows users to perform various tasks. Software is the life of a computer, a computer is just a dead hardware that is useless without software.

Anggraeni (2017: 2) states that "information systems are an orderly combination of people, hardware, software, communication networks and data resources that collect, transform, and disseminate information in an organisation". Meanwhile, according to Supriyadi (2021: 9), "Information Systems (IS) or Information Systems (IS) are organised systems for the collection, organisation, storage, and communication of information". Based on the definition of information systems, it can be concluded that information systems are a

form of communication system that can represent data and be processed as a form of social memory.

According to John Miner and Merry Green Miner in his book *Personal and Industrial Relations: A Managerial Approach* cited by Moekijat (2016: 355) defines that "Human resource planning is a process that seeks to ensure that the right number and type of employees will be available in the right place, at the right time for the future, able to do the things needed so that the organisation can continue to achieve its goals". Meanwhile, according to Nawawi (2017: 44) that: "HR planning is the process of determining strategies to obtain, utilize, develop, and maintain human resources in accordance with the needs of the organisation/company now and its future development". Based on the definition of HR planning, it can be understood that HR planning is a process of determining strategies in the acquisition, utilization, and development of HR according to the needs of the organisation both in the present and in the future.

### **C. RESEARCH METHODOLOGY**

The research method used in this paper is the library research method. The library research method or also called library study is one of the channel type methods of qualitative research methods. In theory, qualitative methods generally have two channels, namely literature study and field study. Literature study is a scientific essay that contains the opinions of various experts on a problem, which is then examined and compared, then conclusions are drawn. Citing references and then performing the appearance of data that has been processed and the last is abstracting and interpreting data which can later be concluded at the end of writing.

### **D. RESULTS AND DISCUSSION**

#### **Definition of Software and Information Systems**

Software, often referred to as "software" is a group of computer programs, data, and instructions designed to control and manage computer hardware. Software is the core component of a computer system and comes in many different types and functions, including: a. Operating System, which is the software that manages and coordinates all computer operations, such as Microsoft Windows, macOS, and Linux; b. Applications: Programmes created to perform specific tasks, such as Microsoft Word, Microsoft Excel, and many others; c. Development Software: Tools that are used to create other software, such as development environments like Visual Studio for programming; d. Networking Software: Software that manages communication and connectivity within a computer network, such as router software and network protocols; e. Security Software: Software designed to protect computer systems from security threats, such as antivirus software and firewalls; f. Security Software. Database Management Software: Software used to create, manage and access databases, such as MySQL and Microsoft SQL Server.

Information system in (Rafiezah Rizcha & Yaakub, 2023) is a system that integrates daily transaction management in supporting the operational functions of an organisation that is managerial in nature with the strategic activities of an organisation to provide certain external parties with the necessary reports. Technically, the Information System is a series of interrelated components starting from collecting, processing, distributing and storing information to support decision making.

Information systems can be used in a variety of contexts, including business, government, or academic organisations. Information systems typically include the following elements: (a) Hardware: This includes all the physical devices used in the system, such as computers, servers, network devices, and data storage devices; (b) Software: As described

above, software is the main component in an information system and is used to manage, process, and present information; (c) Data: Information that is collected, stored, and processed in the system. Data can be text, images, sound or other types of information; (d) Procedures: Guidelines, policies, rules, and procedures used in managing and processing data in the system.

Information systems aim to provide valid and accurate information to users in the organisation, which can then be used as a basis for decision making, analysis, planning, and various other activities. Information systems can help organisations manage resources, optimise business processes, and achieve their strategic goals.

### **Data Collection and Analysis**

The software enables organisations to collect, store and analyse HR data more efficiently. The data includes information about employees, HR needs, performance, and labour market trends.

Data collection and analysis is a key stage in HR planning, it allows organisations to make decisions based on accurate and relevant information. It helps organisations identify current and future HR needs, and plan HR strategies accordingly. Data collection and analysis in HR planning helps organisations make evidence- and fact- based decisions, reduce risks, and ensure that the necessary human resources are available to achieve business objectives. It also enables organisations to be more adaptive to change and contribute to long-term success.

The process of data collection and analysis in HR planning is as follows: a. Identify Objectives and Data Needs. Define your HR planning objectives. What do you want to achieve with the data you will collect and analyse? For example, do you want to forecast future HR needs, identify performance trends or evaluate training effectiveness? b. Select Data Source. Identify the data sources you will use. Data sources can include internal HR information systems, performance reports, employee surveys, labour market data, and others. c. Data Collection Method Design. Design a data collection method that suits your purpose. This could include surveys, interviews, observation or document analysis. Make sure your chosen method can generate relevant data. d. Data Collection. Conduct data collection according to the method you have designed. Make sure the data is collected systematically and with respect to privacy policies. e. Data Verification and Validation. Ensure that the data you collect is accurate and credible. Verify and validate the data to avoid errors that may arise during the collection process. f. Data Analysis. Use data analysis techniques based on the type of data you have, including statistical analysis, trend analysis, data modelling, and others. The purpose of analysis is to identify patterns, trends and relevant findings. g. Interpretation of Results. Once the data analysis is complete, interpret the results. Do the data findings support your HR planning objectives? What are the implications for decision making? h. Create an Action Plan. Based on the results of the data analysis, create an action plan. What are the concrete steps you will take based on the data findings? This could include employee development, changes in HR policies, or new recruitment strategies. i. Feedback and Reporting. Share the results of the data analysis with relevant stakeholders, such as senior management, HR department, or leadership team. Provide feedback and recommendations based on the data findings. j. Evaluation and Revision. After taking action based on the data, evaluate the impact. Were the steps taken successful? HR planning is an ongoing process, and you may need to revise your strategy based on the evaluation results.

### **Planning and Projections**

Human resource planning (HRP) according to Kenton in (Firmansyah, 2023) is a continuous process of future-oriented systematic planning to achieve optimal utilisation of the most valuable asset owned by the company, namely quality human resources. One of the main roles of HR planning software is to facilitate the projection of future HR needs. These



projections enable organisations to plan carefully and address challenges that may arise in the course of their business.

Factors Affecting Human Resource Requirement Projections: a. Projecting future HR needs involves analysing various factors that may affect the number, quality and composition of employees required. Some of the major factors taken into account by HR planning software include: b. Business Growth: Business growth projections are an important element in HR planning. The software allows organisations to illustrate forecasts of revenue growth, increased production, or market expansion. This will affect the need to recruit more employees or the development of appropriate skills. c. Technological Change: Technological advancements can significantly affect HR needs. Software can help organisations foresee technological changes that might affect the competencies required by employees in the future. This could involve training to deal with new technologies or replacing roles that are no longer relevant. d. Changing Demographics: Employee demographics can play an important role in HR projections. HR planning software can assist organisations in understanding changes in the age composition, gender or background of employees that may affect retirement drawdowns, succession needs or employee benefits programs.

Accurate and careful projection of HR needs brings various benefits to the organisation, including: a. Informed Decision Making: Projections allow organisations to make decisions based on evidence and data, not just estimates. This can help avoid mismatches between HR needs and business realities. HR efficiency: By knowing future HR needs, organisations can better plan and manage HR efficiently, avoiding over- or under-staffing. b. Increased Responsiveness: Projections help organisations to be more responsive to changes in the business environment and plan adaptive HR strategies. c. Lower Risk: By having a clearer picture of future HR needs, organisations can reduce the risk of inappropriate HR planning. d. Employee Development: Projections provide foresight into employee development needs, allowing organisations to plan training and skills development accordingly. HR planning software has become an invaluable tool in helping organisations deal with uncertainty. By considering factors such as business growth, technological changes, and changing demographics, organisations can plan for effective, responsive, and future-oriented HR.

### Performance Management

Information systems have a crucial role in assisting organisations in three main aspects related to employee performance management, namely monitoring and evaluating employee performance, enabling the development of employee development plans, and providing more structured feedback, with the following description: a. Monitoring and Evaluating Employee Performance: Information systems allow organisations to routinely and structurally monitor employee performance. This is done through the collection of performance data from various sources, such as work results, productivity, or evaluations by supervisors. This performance data is integrated and processed by the information system, which allows the organisation to have a better understanding of how employees are performing. With continuous monitoring, organisations can identify positive trends or issues in employee performance, so they can respond quickly and effectively. Plan Development b. Employee Development: Information systems collect relevant performance data and identify individual development needs. With such data, organisations can plan more focused employee development. This could include specialised training, project assignments, or skill development that matches individual goals and organisational objectives. The creation of a personalised development plan helps ensure that every employee has the opportunity to grow and make a greater contribution to the organisation. c. Provide More Structured Feedback: Information systems allow organisations to provide more structured feedback to employees. Such feedback is based on data and facts, making it more objective than feedback based on subjective perceptions. With structured feedback, employees have a clearer view of their performance, as well as areas that need improvement. It also allows employees to plan and execute corrective actions. Overall, information systems play an

important role in enabling organisations to manage employee performance more efficiently and effectively. By monitoring performance, devising development plans, and providing structured feedback, organisations can improve productivity, employee retention, and achieve their business goals.

### **Recruitment and Selection**

The use of recruitment software allows organisations to improve efficiency and accuracy in the selection and screening process of potential employees. One of the increasingly common technologies used in recruitment software is artificial intelligence algorithms.

Here is a more detailed description of how recruitment software helps in this regard:

- a. **Efficient Initial Screening:** Recruitment software allows organisations to create selection criteria that are specific to the job requirements. With this software, organisations can automate the initial screening process based on predefined criteria. This can include work experience, education, and key skills. This automated process saves time and effort previously used to manually review many applications.
- b. **Artificial Intelligence Algorithms:** Advanced recruitment software often uses artificial intelligence (AI) algorithms to assess applications and potential employees. AI algorithms can analyse a lot of data quickly and efficiently, including resumes, cover letters, and even online track records of potential employees. With AI, the software can identify potential candidates more accurately, reduce subjective bias, and enable selection based on objective data.
- c. **Identify the Best Candidates:** With AI-powered recruitment software, organisations can more easily identify candidates who best fit the job requirements and company culture. This reduces the risk of mistakenly selecting candidates who do not fit the job or work environment, which can lead to hiring failures.
- d. **Time and Cost Savings:** The traditional manual selection process can be time-consuming and costly. Recruitment software helps automate many repetitive tasks, speed up the process, and reduce costs associated with employee selection.
- e. **Continuous Improvement in Selection:** Recruitment software can monitor the performance of candidates who have been recruited, allowing organisations to better understand the effectiveness of the selection process. This allows organisations to make continuous improvements in employee recruitment and selection strategies. As such, the use of recruitment software, particularly with the integration of artificial intelligence algorithms, provides significant benefits to organisations in the screening and selection of prospective employees. This not only improves the efficiency of the recruitment process, but also increases the accuracy in finding the most suitable candidate for the job, which in turn can positively impact the productivity and success of the organisation.

### **Payroll and Compensation Management**

A payroll information system is an essential tool in HR management, allowing organisations to manage employee salaries, benefits, and perks more efficiently while ensuring legal compliance. Its role and benefits are:

**Employee Salary Management:** Payroll information systems allow organisations to automate the calculation of employee salaries. It includes various components such as basic salary, allowances, incentives, bonuses, and tax deductions. By using specialised software, the salary calculation process becomes faster, more accurate, and structured. This reduces the risk of human error in salary calculation and provides greater transparency to employees.

**Management. Benefits and Allowances:** Payroll information systems allow organisations to manage the various allowances and benefits provided to employees, such as health, retirement, and insurance benefits. This information can be stored, managed, and updated automatically, thus ensuring that employees receive benefits that are in line with company policies. **Financial Monitoring and Reporting:** Payroll information systems provide the ability to monitor and track all costs associated with employee salaries and benefits. This

allows companies to better manage budgets and understand the financial impact of various salary and benefit components.

**Legal Compliance:** One of the key benefits of a payroll information system is ensuring legal compliance. The software can integrate applicable taxation rules and regulations and labour provisions. In this way, the system can ensure that salaries, tax deductions, and benefits provided are in accordance with applicable legal regulations, avoiding potential sanctions or legal issues. **Administrative Efficiency:** Payroll information systems reduce the manual work required in the management of employee salaries and benefits. This allows the HR department to focus on more strategic tasks rather than routine administration. **Accountability and Transparency:** Payroll information systems create complete records and audit trails, so every salary transaction can be traced and verified. This helps create a higher level of accountability in the management of salaries and benefits.

### **Payroll and Compensation Management**

The use of software and information systems provides a variety of benefits to individuals, organisations and society at large. Here are some of the key benefits of utilising software and information systems:

- a. Faster and more accurate decision-making.
- b. Time and human resource savings in HR administration processes
- c. Increased employee productivity.
- d. Ability to respond quickly to market and business changes.
- e. Real-time data availability for analysis

### **Challenges and Opportunities**

The utilisation of software and information systems to support human resource (HR) planning offers many opportunities, but also faces a number of challenges. Here are some challenges and opportunities to consider:

- a. **Challenge: Data Security:** The involvement of employee data and other sensitive data in information systems requires strong protection against data security breaches. This challenge involves vulnerability to cyberattacks and the risk of data theft.
- b. **Incompatibility of legacy systems:** Integrating new software and information systems with an organisation's existing legacy systems can be difficult and costly. This challenge is mainly related to the compatibility of existing data and hardware.
- c. **HR Training and Adjustment:** Implementation of new software often requires significant employee training. These challenges include the time and cost required for training, as well as the adjustment of employees to changes in work processes.
- d. **Sustainability and Maintenance:** Software and information systems require regular maintenance and updates to ensure optimal performance. This challenge is related to the cost and time required for maintenance as well as updates that may be delayed.
- e. **Assessment of Data Accuracy and Reliability:** The use of data in HR decision-making depends on the accuracy and reliability of the data entered in the system. These challenges include human error in data collection, data integrity issues, and hardware or software failures.

In the Era of society 5.0, companies focus on "Digital Transformation", which is changing the way entrepreneurs operate their business. through increasingly sophisticated technology, entrepreneurs are required to be able to adapt quickly and need to ensure that their business meets the requirements for competition in the digital market. (Supriyati, Adriyan Radiansyah, 2023).

In addition to the challenges, the utilisation of software and information systems to support HR planning also has various opportunities in the future, including:

- a. **More Accurate Performance Monitoring:** Software and information systems enable more accurate monitoring of employee performance based on objective data. This helps in the identification of high performance and areas of improvement.

- b. In-depth Data Analysis: The process of data collection and analysis by the software enables organisations to gain deeper insights into HR dynamics. This can support long-term and strategic planning.
- c. Time and Cost Savings: Automation of HR processes through software can save time and money previously required for administration and data processing.
- d. Better Decision Making: Accurate information and sophisticated data analysis help leaders make better decisions related to employee recruitment, development, and retention.
- e. Better Risk Management and Compliance: Information systems can help organisations monitor and comply with employment regulations and tax compliance, reducing legal risks and sanctions.
- f. Flexibility and Scalability: Software and information systems can be adapted to the needs of the organisation, and they are often easily upgraded as the organisation grows.
- g. Improved Collaboration: Information systems support better collaboration between the HR department and other departments, enabling the sharing of relevant data.
- h. Increased Employee Satisfaction: Efficient use of information systems can help in the preparation of appropriate employee development plans, which in turn can improve employee satisfaction and retention.
- i. With a good understanding of the challenges and opportunities in the use of software and information systems in HR planning, organisations can take proactive steps to overcome obstacles that may arise while leveraging technology and information systems.

#### **Solutions to overcome obstacles**

Utilising software and information systems to support human resource (HR) planning can bring many benefits to an organisation. However, as with implementing technology in any aspect of business, you may face some barriers. Here are some solutions to overcome these obstacles:

- a. Employee education and training on how technology can improve the HR planning process is essential. Organisations should ensure that their employees understand the potential benefits and their needs in adopting these technologies.
- b. Ensure that the data used in the information system is of high quality. Keep data up-to-date and expanded. Use regular data validation and cleansing processes.
- c. Make a good budget plan and consider this investment as a long-term investment. Evaluate the long-term costs and benefits, including expected efficiencies and cost savings.
- d. Prioritise data security. Use encryption, double authentication and other security measures to protect sensitive data. Ensure the system has appropriate compliance with applicable data security regulations. Information systems support clear business objectives. Conduct regular evaluations to ensure that the system is still relevant and in line with the changing needs of the organisation.
- e. Involve employees in the change and communicate openly about the expected benefits. Incentivise those who contribute to the success of the change.
- f. Do good planning and use solutions that support integration with existing systems. This can minimise compatibility issues.
- g. Ensure that there is a team in place to provide technical support and system maintenance on a consistent basis. Consider a service contract with a third party if required.
- h. Participating in the digitalisation of the HR planning system is something that should happen because of the demands of changing times. The company must be forced to adjust and its human resources must be ready to implement the plan within a certain period of time. HR must upgrade themselves and not only with training from the company, as well as mature adjustments to become part of the company in the digitalised era, new HR recruited in the company are expected to be able to adapt and provide good impact and sustainability. (Umar et al., 2023).



## E. CONCLUSIONS AND SUGGESTIONS

Technological change has become a major driving force in business transformation in the modern era. The digital revolution has affected every aspect of a company's operations.

The use of software and information systems in HR planning helps leaders make faster and more accurate decisions and optimise business processes. HR planning software assists companies in projecting future HR needs, allowing them to plan carefully and overcome challenges that may arise.

Information systems also assist in employee performance management, monitoring performance, drawing up development plans, and providing more structured feedback.

Recruitment software uses artificial intelligence algorithms to facilitate more efficient and accurate employee selection.

Payroll information systems enable more efficient management of employee salaries, allowances and benefits while ensuring legal compliance.

The utilisation of software and information systems brings various benefits, including faster decision-making, time and resource savings, and increased productivity.

The use of software and information systems in HR planning is a long-term investment that can help organisations improve efficiency, productivity and accuracy in their human resource management.

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