Functional Area 06
HR Information Management

Professional in Human Resources – International (PHRi) - 2021

Professional in Human Resources – International (PHRi) Workbook

Module Six: HR Information Management

2021 Edition

Introduction

This workbook is not a textbook. These materials include workbooks and practice exams are intended for use as an aid to preparation for the **PHRi** Certification Exam conducted by the HR Certification Institute. By using all of the preparation materials, you will be well-versed in the **six** key functional areas that make up the HR Certification Institute **PHRi** body of knowledge. Studying these materials does not guarantee, however, that you will pass the exam. These workbooks are not to be considered legal or professional advice.

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Part One: HR Technology and Business Processes

1. Technology and Human Resource Management

In the 20th century, Human Resource (HR) departments were called personnel departments, and these departments created procedures, forms, and levels of authorization to process personnel recruiting, payroll, attendance and leave, and performance appraisals. These departments also helped organizations meet the requirements of government laws, rules, and regulations relating to equal employment opportunities, occupational safety and health, and employee benefits. Because the department's functions are largely administrative, the development of information technology (IT) focused on operational efficiency within these departments. Personnel departments implemented Human Resource Information Systems (HRIS) to automate their internal workflows. By gathering, storing, integrating, and transforming HR administrative data into information that can be utilized in HR decision making, HRIS can improve the quality and efficiency of HR departments and can relieve the administrative burden of HR's day-to-day duties.

As more transactional services became provided electronically via HRIS, HR personnel obtained greater opportunities to focus on human relations tasks, such as training, development, employee relations, and total rewards. By the end of the 1980s, personnel departments had generally been renamed HR departments. This development marked the first wave of the transformation of HR departments. However, HRIS were insufficient for the new role of HR departments. Line managers and employees increasingly believed that information systems should not only improve HR processes in terms of business planning and personnel capabilities but also allow company employees to manage their own personnel information.

The economic landscape underwent radical changes throughout the 1990s with increasing globalization, technological breakthroughs (particularly Internet-enabled Web services), and hyper competition. Business process reengineering exercises became more common and frequent, resulting in several initiatives, such as the rightsizing of employee numbers, reducing the layers of management, reducing the bureaucracy of organizational structures, creating autonomous work teams, and outsourcing.

During the 1990s, electronic human resource management (e-HRM) emerged due to the growth of corporate intranets. In contrast to HRIS, e-HRM extends beyond traditional HR-related administrative functions to provide a web-based HR channel for the entire organization. In fact, e-HRM is an umbrella term that covers all of the possible integration mechanisms and content of HR and IT, such as HR portals, talent profile mapping, e-learning, and human capital dashboards. The primary goal of e-HRM is to support decision making and to provide self-service capabilities for internal corporate stakeholders, including employees and line managers. Thus, HR has become a business partner that helps align business functions with HR-related policies and practices.

Alterations in HR functions are expected to continue. In the late 1990s, Fortune magazine published a story about "blowing up the HR function"; this story indicated that HR was not

considered to be a department that adds strategic value to a firm. As business partners, HR departments can deliver immediate HR services, management decision support, and human capital metrics, but they cannot deliver business results. Therefore, HR is expected to cease being a passive business partner and instead becomes a proactive business driver that seeks solutions that involve and influence the perspectives of external stakeholders (i.e., investors and customers) and thereby directly impact business results. Although the management of external stakeholders is traditionally the domain of sales, marketing, and public relations, the expansion of HR into this new territory can allow these departments to follow a top-down process to derive service strategies that are driven by outcome measures. For example, by connecting with customers, HR can ensure that a firm's talent acquisition, development, reward, and retention programs all function to encourage the skills that are required for customer satisfaction. Connections with investors can allow a firm's intangible assets, including its quality of leadership and human capital, to be observed in a manner that is not evident from its financial reports; thus, these connections can provide investors with confidence in a firm's future earnings.

However, the global economy has forced many HR departments to operate with limited budgets, raising questions about how HR value can be most efficiently delivered for both internal and external stakeholders. Many organizations are turning to different HR technologies to promote and deliver information to their target audiences.

1.1. HR Activities

HR departments engage in three types of activities as follows:

1.1.1. Transactional HR activities involve day-to-day transactions that have to deal mostly with record keeping—for example, entering payroll information, employee status changes, and the administration of employee benefits - 65% to 75% of the time.

1.1.2. Traditional HR activities involve HR programs such as planning, recruiting, selection, training, compensation, and performance management - 15% to 30% of the time.

1.1.3. Transformational HR activities are those actions of an organization that "add value" to the consumption of the firm's product or service. An example of a transformational HR activity would be a training program for retail clerks to improve customer service behavior, which has been identified as a strategic goal for the organization– 5% to 15% of the time.

One of the main purposes of HR technology is to reduce the amount of time spent on transactional activities and shift that time for HR professionals to use for traditional and transformational activities.

1.2. A Primer on HRIS

Important to note that a company that does not have a computerized system still has an HRM system; that is, the paper system used to acquire, store, manipulate, analyze, retrieve, and distribute information regarding an organization's human resources.

An HRIS is not simply computer hardware and associated HR-related software. Although an HRIS includes hardware and software, it also includes people forms, policies and procedures, and data.

The primary purpose of the HRIS is to provide service, in the form of accurate and timely information, to the "clients" of the system. There are a variety of potential clients, as HR information may be used for strategic, tactical, and operational decision making (e.g., planning for needed employees in a merger); to avoid litigation (e.g., identifying discrimination problems in hiring); to evaluate programs, policies, or practices (e.g., evaluating the effectiveness of a training program); and to support daily operations (e.g., helping managers monitor the work time and attendance of their employees).

Because of the complexity and data intensiveness of the HRM function, it is one of the last management functions to be targeted for automation. This fact does not mean that an HRIS is not important; it just indicates the difficulty of developing and implementing it compared with other business functions—for example, the billing and accounting systems. Powered by information systems and the Internet, almost every process in every function of HRM has been computerized today

1.3. Why HRIS?

There are several advantages to firms in using HRIS. They include the following:

- Providing a comprehensive information picture as a single, comprehensive database; this enables organizations to provide structural connectivity across units and activities and increase the speed of information transactions
- Increasing competitiveness by improving HR operations and improving management processes
- Collecting appropriate data and converting them to information and knowledge for improved timeliness and quality of decision making
- Producing a greater number and variety of accurate and real-time HR-related reports
- Streamlining and enhancing the efficiency and effectiveness of HR administrative functions
- Shifting the focus of HR from the processing of transactions to strategic HRM
- Reengineering HR processes and functions
- Improving employee satisfaction by delivering HR services more quickly and accurately to them.

1.4. E-HRM vs. HRIS

Confusion can arise concerning the distinction between electronic human resource management (E-HRM) and HRIS. E-HRM reflects a philosophy for the delivery of HR; it

uses information technology, particularly the Web, as the central component of delivering efficient and effective HR services. Conversely, as conceptualized in this book, an HRIS comprises the technology and processes underlying this new way of conducting human resource management. An HRIS can include technologies such as databases, small functional systems focused on a single HR application (e.g., performance management), or a large-scale, integrated enterprise resources planning (ERP) architecture and Web-based applications. In today's environment, it can even be devices such as smart phones and social networking sites that enable employees to access HR data remotely or to connect with others in the organization.

Another way of looking at the differences between E-HRM and HRIS is that E-HRM tends to be more application and HR-function focused (e.g., e-recruitment and e-training), and an HRIS is more focused on the systems and technology underlying the design and acquisition of systems supporting the move to e-HRM.

1.5. HR Service Delivery

Human Resources (HR) provide services to the organization in a variety of models. Services are delivered by people through service centers and through the use of technology. People-based service delivery can be centralized or decentralized. Technology can provide informational services or allow self-service for completing HR processes. Services can be offered internally using company employees or outsourced to third-party providers. These methods are not exclusive of one another and it is common to find a blend of these service delivery methods in one organization.

1.5.1. Centralized HR Services

This is used to refer to services that are delivered by people who are located in one place, which may be called a "Service Center". This delivery model does not allow for an HR representative to be in each company location. Managers and Employees will reach out to HR via phone to speak to a representative to assist them as well as rely on self-service applications. An HR Service Center may be staffed with representatives internal to the company or may be outsourced to a third party. Regardless of staffing, the benefits of having a centralized HR Service center are reduced cost for HR services, consistency of information and common HR processes.

1.5.2. Decentralized HR Services

This is used to refer to services that are delivered by people who are in the locations throughout the organization. This delivery model staffs each separate location with persons who are responsible for delivery of HR Services. Most common would be to have an HR Generalist assigned to these locations to support managers and employees at that specific location. This model offers a high level of personal service and may also be supported with self-service technologies. This model however typically costs more than the centralized model and it is common for HR processes in this model to be location specific and not consistent across the enterprise.

1.5.3. Outsourced HR Services

This refers to the delivery of HR through a third-party contractor, most commonly via a service center. When creating a technology strategy, understand what the HR Strategy service delivery is. If HR currently is outsourced or is planning to outsource some or all of its services, this needs to be taken into consideration in the technology strategy. There are two (2) general categories of outsourced services; Human Resources Outsourcing (HRO) and Business Process Outsourcing (BPO).

HRO is an outsourcer that assumes responsibility for the entire HR function. The vendor will typically take over management of the HR system and all administrative processes in HR.

BPO is an outsourcer that assumes responsibility for a specific process within HR. An example of this would be an outsourcer who assumes responsibility for the management and administration of the benefits programs of a company.

Most of these service centers have advanced technology for self-service, as well as to manage and track calls that are called "cases." Oftentimes outsourcing a specific process, like benefits administration, will enable a company to deliver online benefits enrollment sooner and more cost effective than if supported internally. The outsourcer has "case management" tools, which allow for accurate recording of calls along with robust reporting for trends that help in continuous improvement of services and identification of potential HR issues. These systems are often too costly for an HR department to purchase and consequently their tracking process is more labor intensive and error prone.

2. HR Data

The intersection of data and human behavior has led to the consumerization of workforce analytics tools. Historically, IT had access to business data and HR relied on them to create workforce reports. But as technology has advanced, these tools have become increasingly easy to use.

HR involves practical application of up-to-date understanding in the context of 'real world' organizations. Reliable knowledge built on accurate information is needed. To undertake effective HRM, it is important that good-quality information underpins decisions and informs the actions of those involved in the employment relationship, such as trade unions, individual employees, outsourced service providers and professional organizations.

In the context of HR, knowledge, data and information play a vital role in implementing important strategies for management of human resources by referring to the facts and figures related with the human resources and demographic profiles.

2.1. Data, Information, and Knowledge

2.1.1. Data

Data represent the "facts" of transactions that occur on a daily basis. A transaction can

be thought of as an event of consequence, such as hiring a new employee for a particular position for a specified salary.

2.1.2. Information

Information on the other hand is the interpretation of these data. An interpretation of data always has some goal and context such as making a hiring decision for a particular department or understanding of the performance of the company to make an improvement.

2.1.3. Knowledge

Knowledge is different from data and information. While information refers to data that have been given structure, knowledge is information that has been given meaning. For example, in HRIS, facts about age, gender, and education are the data. When these data are transformed into average age, gender ratio, and number and types of graduates at the unit level, they become information. More than what and why, knowledge is about how. It is procedural and mostly hidden in the minds of individuals and groups in the organization.

In the HR function, data about employees and jobs are the foundation of most of the information that is critical to analyzing and making HR decisions. Knowledge constitutes knowing what information is needed from a database and how to use it to achieve HR objectives.

2.2. Type of Data

Data are pieces of information used to analyze something. Two types of data used in workforce analysis are qualitative and quantitative data. Although there are several differences, the most apparent difference is that quantitative data involves numbers.

2.2.1. Quantitative data

Quantitative data refer to the information that is collected as, or can be translated into, numbers, which can then be displayed and analyzed mathematically.

2.2.2. Qualitative data

Qualitative data are collected as descriptions, anecdotes, opinions, quotes, interpretations, etc., and are generally either not able to be reduced to numbers, or are considered more valuable or informative if left as narratives.

Qualitative information for human resources includes surveys, interviews, opinions and academic literature, while quantitative information includes statistics and numerical calculations relating to human resources research. Human resources researchers collect qualitative information and analyze it using quantitative information. Gathering qualitative data from employees and managers provides "real-time" information about employee morale, team building and reveals problem areas

within an organization, its management, and employee performance and training. Quantitative information includes statistical tables, mathematical charts, salary benchmarking and reports breaking down survey and interview results by percentages of participants.

	Data	Analysis	Methods
Qualitative	Focuses on opinions, attitudes, and beliefs	Asks and replies to questions of: Why? Would? How?	Focus group discussions and in-depth interviews with employees
Quantitative	Focuses on data and hard numbers	Asks and replies to questions of: How many' Who? Where How often?	Surveys and data tracking forms, such as satisfaction , salary, and turnover reports

Source: Othman, S. (2014). Benefits of Combining Qualitative & Quantitative Methods. Available on shayaaresearch.blogspot.tw.

HR departments conduct research for determining salary benchmarks for their industries, researching the cost and coverage of health benefits, and for surveying employees and management. Quantitative and qualitative information are helpful for identifying trends and areas for improvement within a workplace. Human resources recruiters and retention specialists gather and tabulate such information for maintaining competitive compensation and benefits. Information gathered is tabulated, analyzed and presented to executive management with recommendations. Human resources researchers also use quantitative information for determining hiring trends and developing demographics for locating job candidates. Surveying employees assists human resources with identifying morale issues, improving employee performance, and reorganizing departments and work flow for improving efficiency.

While the Quantitative design strives to control for bias so that facts can be understood in an objective way, the Qualitative approach is striving to understand the perspective of the program stakeholders, looking to firsthand experience to provide meaningful data. The accumulation of facts and causes of behavior are addressed by quantitative methodology as the qualitative methodology addresses concerns with the changing and dynamic nature of reality. Quantitative research designs strive to identify and isolate specific variables within the context (seeking correlation, relationships, causality) of the study as the Qualitative design focuses on a holistic view of what is being studied (via documents, case histories, observations and interviews). Quantitative data is collected under controlled conditions in order to rule out the possibility that variables other than the one under study can account for the relationships identified while the Qualitative data are collected within the context of

their natural occurrence.

Both Quantitative and Qualitative research designs seek reliable and valid results. Data that are consistent or stable as indicated by the researcher's ability to replicate the findings is of major concern in the Quantitative arena while validity of the Qualitative findings are paramount so that data are representative of a true and full picture of constructs under investigation. By combining methods, advantages of each methodology complements the other making a stronger research design with resulting more valid and reliable findings. The inadequacies of individual methods are minimized and more threats to Internal Validity are realized and addressed.

Human resources departments use qualitative and quantitative information for investigating employee performance problems and personnel issues. Qualitative data can assist human resources departments with identifying personnel problems and sources of employee morale problems. Quantitative information including attendance records and production reports assist with identifying individual and team problems within an organization. Workplace safety officers evaluate quantitative data reporting employee injuries and equipment failures for identifying and reducing potential for workplace injuries. Qualitative and quantitative information used together provide a full range of information for the topic or circumstances being researched. Qualitative information provides multiple points of view about a research topic, while quantitative data provides direct and objective information.

2.3. Essentials of Statistics

When you get a big set of data there are all sorts of ways to mathematically describe the data. The term "average" is used a lot with data sets. Mean, median, and mode are all types of averages. Together with range, they help describe the data.

2.3.1. Mean

When people say "average" they usually are talking about the mean. You can figure out the mean by adding up all the numbers in the data and then dividing by the number of numbers. For example, if you have 12 numbers, you add them up and divide by 12. This would give you the mean of the data. For example, if you have three people, one of whom earns $1, one of whom earns $2, and one of whom earns $1000, the mean salary is $334.33 ($1003/3).

2.3.2. Median

The median is the middle number of the data set. It is exactly like it sounds. To figure out the median you put all the numbers in order (highest to lowest or lowest to highest) and then pick the middle number. If there is an odd number of data points, then you will have just one middle number. If there is an even number of data points, then you need to pick the two middle numbers, add them together, and divide by two. That number will be your median.

For example, the median salary rate is the salary that is exactly in the middle if EVERY person is placed in rank according to salary (let's say lowest to highest salary). In the

example above, you'd have: person A $1; person B $2; person C $1000

The median salary is $2. Half the people have salaries above the median and half the people have salaries below the median. The median is useful when salaries are unequal. For example, when someone is paid a lot more than others, like in this example, the mean is strongly influenced. When you say the average is $334, it looks like everyone is doing OK. The median is more reflective (so, you know, for example, that half the people do worse than $2) in this case.

For salary data, the median salary (or net compensation) is the salary "in the middle." That is, half of the employees earned below this level.

2.3.3. Mode

The mode is the number that appears the most. There are a few tricks to remember about mode:

If there are two numbers that appear most often (and the same number of times) then the data has two modes. This is called bimodal. If there are more than 2 then the data would be called multimodal. If all the numbers appear the same number of times, then the data set has no modes.

Imagine that you live in a small town where most of the people are employed by a factory and earn minimum wage. One of the factory owners lives in the town and his salary is in the millions of dollars. If you use a measure like the average to try to compare salaries in the town as a whole, the owner's income would severely throw off the numbers. This is where the measure of mode can be useful in the real world. It tells you what most of the pieces of data are doing within a set of information.

2.3.4. Range

Range is the difference between the lowest number and the highest number. Take, for example, math test scores. Let's say your best score all year was a 100 and your worst was a 75. Then the rest of the scores don't matter for range. The range is 100-75=25. The range is 25.

For example, the wages for Pharmacists in the United States are generous, with average pay above six figures ($107K) per year. Total cash earnings of Pharmacists range from $83K on the low end to $133K on the high end. Thus, the pay range is $50K ($133K-$83K).

2.3.5. Percentile

A percentile is best described as a comparison score. It’s a common term in all kinds of testing of data, but many will be most familiar with percentiles as they relate to personality assessment or salary survey. If you scores at the 75th percentile (P75) on the IQ test, you did "as well or better than" 75% of the ones taking the test (norm group).

2.3.6. Quartiles

Quartiles are values that divide a set of data into four equal parts. For example, the

owner of a super market recorded the number of customers who came into his store each hour in a day. The results were 12, 8, 10, 7, 15, 3, 6, 7, 12, 8, and 9. The ascending order of the data is 3, 6, 7, 7, 8, 8, 9, 10, 12, 12, 15. The lower quartile is 7, the median (second quartile) is 8, and the upper quartile is 12.

2.4. Reporting

The information contained in the HRIS is important to making business decisions. The right reporting tools are critical to the success of the HRMS providing information to the organization. Most HRMS applications provide a standard set of reports intended to be run and printed as a list of information. The most common of these are the birthday; new hire list and government regulatory reports. These lists tend to be a snapshot of the data and static in nature meaning that as the data changes in the system, the reports must be re-run to reflect any data changes. HRMS applications also provide tools to create ad hoc lists or queries, users can develop “ad hoc" reports to create specific, customized reports. Query tools allow for the creation of reports that are custom to the company’s needs allowing complete control and flexibility of the report’s contents. Query tools are intended for non-technical users and are typically designed with easy-to-use features.

As an alternative to the static list, there are tools that allow for more dynamic means of data creation. While traditional systems store data in rows and columns similar to a spreadsheet, these tools store data in “cubes” so the data can be interrogated in various means for analytical purposes. Often the reports these tools create are at a summary level and, through the technology, allow one to “drill down” on a data point into more specifics of the information presented. These types of reporting tools are frequently used in dashboards and intranet applications designed for use by business decision makers.

2.5. Data Integration

2.5.1. Database

An organization’s ability to generate meaningful information to make good decisions is only as good as its underlying database.

2.5.2. Metrics

A metric refers to a measure based on one or more data elements that provides a number that has meaning when placed in a relevant context. Within the context of HR, it is a measurement based on HR data that is an indicator of company performance. The more effectively human resources can be measured along with human resources’ impact on the corporation, the better the company can be managed.

The objective of metrics is to solve problems and improve the human capital effectiveness by putting the right numbers of people in the right places at the right time with the right skills to accomplish the organization’s objectives. Because every organization has its own set of priorities, each organization will establish metrics that are focused on what is important to them. While some metrics may be common across multiple organizations, like measuring the effectiveness of the hiring process, exactly what the measures are will differ based on each company’s processes.

2.5.3. Data warehouses

Much of the data now available to create HR metrics come from an organization's data warehouse. A data warehouse is a special type of database that is optimized for reporting and analysis and is the raw material for management's decision support system. Data warehouses and BI software enable managers to create information from an even greater store of data.

A data mart is one piece of a data warehouse where all the information is related to a specific business area. Therefore it is considered a subset of all the data stored in that particular database, since all data marts together create a data warehouse.

2.5.4. Business intelligence (BI)

Business intelligence (BI) is a broad category of business applications and technologies for creating data warehouses and for analyzing and providing access to these specialized data to help enterprise users make better business decisions. Essentially, BI systems retrieve specified data from multiple databases, including old legacy file database systems, and store these data in a new database, which becomes that data warehouse. The data in the data warehouse can then be accessed via queries and used to uncover patterns and diagnose problems.

Patterns in large data sets are identified through "data mining", which involves statistically analyzing large data sets to identify recurring relationships. Data mining is the process of finding anomalies, patterns and correlations within large data sets to predict outcomes.

BI systems also provide reporting tools and interfaces (e.g., forms) that distribute the information to Excel spreadsheets, Internet-based portals, pdf files, or hard copies. These results can also be distributed to key executives in specialized formats known as executive dashboards, which are becoming a popular executive decision support tool.

2.5.5. Analytics

Analytics refers to methods of manipulating and combining metrics in order to gain insights necessary to aid problem solving and decision making. It is the process of looking at that which is measured to understand what it means relative to the data that is being presented.

Some common ways that metrics are presented are in graphs and charts. Analytics encompasses the reviewing of those graphs and charts to understand what they are showing relative to the business outcome.

Tactical decisions on how to better improve the company are results of using analytics. Good analysis requires good data. Good data relies on accurate and reliable measures. This is the link between metrics and analytics. Metrics are the measures that are tracked that produce the data. Analysis is the interpretation of the data into business decisions. The two are intrinsically linked.

3. Human Resource Information System (HRIS)

Human Resource Information System (HRIS) can be briefly defined as integrated systems

used to gather, store, and analyze information regarding an organization's human resources. But, as is the case with any complex organizational information system, an HRIS is not limited to the computer hardware and software applications that comprise the "technical" part of the system; it also includes the people, policies, procedures, and data required to manage the human resources function. Thus, a functional HRIS must create an information system that enables an assimilation of the policies and procedures used to manage the firm's human capital as well as the procedures necessary to operate the computer hardware and software applications.

HRIS is an information system (IS) used to acquire, store, manipulate, analyze, retrieve, and distribute information regarding an organization's human resources. The purpose of the HRIS is to provide service, in the form of accurate and timely information, to the "clients" of the system. As there are a variety of potential users of HR information, it may be used for strategic, tactical, and operational decision making (e.g., to plan for needed employees in a merger); to avoid litigation (e.g., to identify discrimination problems in hiring); to evaluate programs, policies, or practices (e.g., to evaluate the effectiveness of a training program); and/or to support daily operations (e.g., to help managers monitor time and attendance of their employees). All these uses mean that there is a mandatory requirement that data and reports be accurate and timely and that the "client" can understand how to use the information.

Because of the complexity and data intensiveness of the HRM function, it is one of the last management functions to be targeted for automation. This fact does not mean that an HRIS is not important; it just indicates the difficulty of developing and implementing it compared with other business functions—for example, billing and accounting systems. Powered by information systems and the Internet, today almost every process in every function of HRM is being computerized.

HRIS is often to be used for administrative purposes in organizations. This purpose is related to administrative and operational efficiency, which reduces costs and time. Traditionally, HR in any organization faces several challenges such as information storage and retrieval (How to manage large quantities of paper?), hiring & firing (How to deal with applicant tracking, black lists, social security issues, and other reports for the government?), training (How to develop training programs that fit the new digital economy?), performance tracking (How to track employee performance worldwide?), and cost figures (How to lower the business information system costs?).

Organizations vary in the types of information that they consider useful and important to collect. Organizations develop at least two kinds of human resource information systems. The first HRIS replaces many of the administrative functions once performed by people in the organization. Human resource information systems, which perform administrative tasks faster than people and require fewer employees, are designed to produce a wide range of vital information at the lowest cost. Companies, in some instances, have implemented human resource information systems as a tool and approach to downsizing. The second HRIS is based on organizational reengineering. HRIS that reengineer organizational processes are based on optimization of the way in which HR managers use information. HRIS with reengineered processes often include interactive employee information kiosks or

Internet-based Web applications. Reengineered HRIS provide employees and managers the opportunity to interact with the organization's databases to apply for jobs, review organizational regulations, and to facilitate communications between employees, managers, and labor unions.

3.1. Benefits of HRIS

The systems and process focus helps organizations keep the customer perspective in mind, since quality is primarily defined and operationalized in terms of total customer satisfaction. Today's competitive environment requires organizations to integrate the activities of each functional department while keeping the customer in mind. An effective HRIS helps by providing the technology to generate accurate and timely employee information to fulfill this objective. There are several advantages to firms in using HRIS. They include the following:

- Providing a comprehensive information picture as a single, comprehensive database; this enables organizations to provide structural connectivity across units and activities and increase the speed of information transactions
- Increasing competitiveness by improving HR operations and improving management processes
- Collecting appropriate data and converting them to information and knowledge for improved timeliness and quality of decision making
- Producing a greater number and variety of accurate and real-time HR-related reports
- Streamlining and enhancing the efficiency and effectiveness of HR administrative functions
- Shifting the focus of HR from the processing of transactions to strategic HRM
- Reengineering HR processes and functions
- Improving employee satisfaction by delivering HR services more quickly and accurately to them

The ability of firms to harness the potential of HRIS depends on a variety of factors, such as:

- the size of the organization, with large firms generally reaping greater benefits;
- the amount of top management support and commitment;
- the availability of resources (time, money, and personnel);
- the HR philosophy of the company as well as its vision, organizational culture, structure, and systems; managerial competence in cross-functional decision making, employee involvement, and coaching; and
- the ability and motivation of employees in adopting change, such as increased

automation across and between functions

In assessing the benefits and impact of an HRIS to an organization, typical accounting methods do not work with the HRM function. While there are several tangible benefits in implementing an HRIS, such as payroll efficiencies and reduction in labor costs due to automation, there are several intangible or hidden benefits as well. They include employee satisfaction with streamlined and efficient HR processes and freeing up HR from routine, administrative matters to focus on strategic goals.

Furthermore, HR practices can help organizations untangle the rigidity and inertia associated with the mechanistic, routine nature of enterprise resource planning (ERP). ERP software applications are a set of integrated database applications or modules that carry out the most common business functions, including HR, general ledger, accounts payable, accounts receivable, order management, inventory control, and customer relationship management. Obviously, HRM's emphasis on knowledge management, human capital stewardship, and relationship building can provide considerable assistance in the implementation and use of ERPs. Therefore, active engagement of HR professionals in the introduction and ongoing functioning of an ERP is important so that organizations can realize the strategic benefits associated with these systems.

Human Resource Information System (HRIS)
Source: SAP HCM Solution

3.2. Types of HRIS

There are multiple typologies for the classification of computer-based systems; however, we are going to define the most basic types of systems and then apply them to their development and use within an HRIS. One of the earliest books in the field of computer-based systems placed systems under three basic categories: Electronic Data Processing (EDP), Management Information Systems (MIS), and Decision Support Systems (DSS). EDP is primarily electronic storage of information and was first applied to automate paperwork.

3.2.1. EDP

The EDP category of HRIS was the earliest form introduced in the HR field and fits in with the transactional level of HR activities. The EDP's basic characteristics include:

- A focus on data, storage, processing, and flows at the operational level
- Efficient transaction processing
- Scheduled and optimized computer runs
- Integrated files for related jobs
- Summary reports for management

3.2.2. MIS

The MIS type of HRIS emerged as technology improved over time, and it fits the traditional level of HR activities, such as recruitment, selection, and compensation. The characteristics of MIS include:

- An information focus, aimed at middle managers
- Structured information flows
- Integration of EDP jobs by business function (production MIS, marketing MIS ...)
- Inquiry and report generation (usually with a database- a collection of information that is organized so that it can easily be accessed, managed, and updated. In one view, databases can be classified according to types of content: bibliographic, full-text, numeric, and images.)

3.2.3. DSS

HRIS at DSS level began to emerge in the cost-effectiveness era of HRM development, and it fits the transformational level of HR activities—adding value to organizational processes. DSS are focused still higher in the organization, with an emphasis on the following characteristics:

- Decision focused, aimed at top managers and executive decision makers

- Emphasis on flexibility, adaptability, and quick response
- User initiated and controlled
- Support for the personal decision-making styles of individual managers

There is another type of HRIS which should be used in organizations to maximize the effect of computer-generated knowledge on managerial decision making. There are numerous reports generated on a regular basis from both the EDP and the MIS types of HRIS—for example, overtime and benefits usage. The critical question is: "how many of these reports are used by either line managers or HR professionals in their daily work, particularly in their decision-making capacity?" All HRIS software is designed to generate a standard set of reports, but surveys and reports from both managers and HR professionals indicate that many of these reports are typically discarded. Thus, it is apparent that another type of HRIS exists—the human resources management decision system (HRMDS). This type of system could be described as the ideal system since it provides critical information for decisions involving the human resources of the company, and thus, should be used as a standard for the development and application of any HRIS. This type has the following characteristics:

- Report formation and generation based on identified managerial needs for decision making
- Categorization of reports by management level
- Timing of report generation based on frequency of managerial use: daily, weekly, monthly
- Historical information retained and reported in a timely manner so that managers and HR professionals can see the results of their use of the information in their previous decisions

3.3. Core HR

There are at least thirteen common human resource information subsystems.

3.3.1. Recruitment and Selection

The recruitment and selection system ensures that the list is current all the time and can be viewed by a prospective applicant anytime; generates various statistics like jobs with high turnover and the average time it takes to fill a vacancy; and tests and evaluates candidates' personality, knowledge, and skills at different company locations.

3.3.2. Personnel Administration

The personnel administration subsystem warehouses information about employee names, birth dates, service dates, race, sex, salary, department code, job code, location code, and employment status.

3.3.3. Time, Labor, and Knowledge Management

The time, labor, and knowledge management subsystem tracks and identifies work schedule patterns, absenteeism, and tardiness, allocates resources, and determines procedures to administer either time-related or knowledge-related tasks or functions based upon an employee knowledge profile.

3.3.4. Training and Development

The training and development subsystem provides programmed instructions and self-paced training to employees; plans classes, sets up training schedules, organizes training courses' activities, and collects fees; and tracks the developmental plan of each employee within the company and their learning progress.

2.3.5. Pension Administration

The pension administration subsystem streamlines plan set-up, record keeping, pension calculations, and retiree payments and statements.

3.3.6. Compensation and Benefits Administration

The compensation and benefits administration subsystem provides information on flexible and non-flexible healthcare plans, short and long-term disability plans, savings plans, retirement plans, pension plans.

3.3.7. Payroll Interface

The payroll interface subsystem streamlines payroll and accounting by providing data on salary, wages, and benefits.

3.3.8. Performance Evaluation

The performance evaluation subsystem aids management with periodic evaluations of employees. This subsystem performs multiple review functions including auditing and analyzing employee competency; analyzing the congruence between employee performance and organizational objectives; and measuring and monitoring the employer's learning progress and performance.

3.3.9. Outplacement

The outplacement subsystem provides support information for discharged or displaced employees such as links to self-help books, career counselors, and training programs on job search techniques, resume development, interviewing strategies, and negotiating salary.

3.3.10. Labor Relations

The labor relations subsystem includes information about work policies on privacy, sexual harassment, and workforce diversity.

3.3.11. Expense and Travel Administration

The expense and travel administration subsystem facilitates and automates employee reimbursement for business expenditures on travel, entertainment, and supplies.

3.3.12. Organizational Management

The organizational management subsystem provides information about all job positions in a company, their hierarchy, and job descriptions; generates decisions on employee hiring, promoting, transferring, retiring, and firing; and reporting requirements of various employment laws.

3.3.13. Health and Safety

The health and safety subsystem provides information about the federal, state, and local health and safety regulations relevant to the organization or workplace as well as information on the company's safety record, injury/illness prevention plan, safety compliance procedures, and worker compensation.

Numerous organizations have shifted the responsibility of updating employee records from human resource staff to the employees themselves. Self-service systems require less direct management and more technological oversight and support. Web-based HRIS allow for global access for telecommuting and traveling employees. Common self-service web-based HRIS applications include Personal Information, Banking Information, Benefits Inquiries and Open Enrollment, Time Entry and Time Off, Cross Application Time Entry, Travel Expenses, Electronic Pay-stubs, Organization Directory, Employment and Salary Verification, Training Overview and Enrollment, and Change Password.

3.4. Self-Services

The use of technology to offer services that would be performed by an HR representative. Commonly called Manager Self-Service (MSS) and Employee Self-Service (ESS), these fall into two (2) categories, informational and transactional

3.4.1. Informational Self-Service

Informational Self-Service refers to tools that are offered to provide information to employees. These tools are commonly referred to as "Knowledge Management" systems. They contain information about HR policies, processes and can include benefits and compensation information. They are informational in that employees cannot perform a transaction within these systems; they are used for reference purposes only. These can be present in either centralized or decentralized service delivery models and are almost always found when HR services are outsourced.

3.4.2. Transactional Self Service

These tools are offered for managers and employees to change information captured in HRIS. Employee Self-Service applications include information that the employee changes, which is typically personal in nature. Common changes that occur in an ESS

system are employee address, emergency contact, tax withholdings and benefit elections. Manager Self-Service applications include information that a manager changes, which is related to the employees they manage. These most often replace paper-based processes for change of employee information like job changes, promotions, transfers and pay changes. MSS applications can also include processes for supporting performance reviews, compensation events and staff planning.

MSS applications commonly use workflow to automatically manage the approval and the routing of information changes. Workflow is a technology that routes an information change to another person for verification or approval before it records the change in the system of record. ESS/MSS applications can be present in either centralized or decentralized service delivery models and are almost always found when HR services are outsourced.

HR self-service benefits include the accuracy of information, consistency of process and reduction of time HR professionals spend in administrative activities.

3.4.3. HR Portals in Self-Service

A portal is a Web application that resides on the intranet (internally) or Internet (externally) that is designed to aggregate and personalize information for access from a single source. The HR portal in an intranet application is used to perform informational or transactional self-service. Based on an employee's role in the organization as defined within their security authorizations, the HR portal will present the applications and information the person is allowed to access. Through the use of single sign on technology, an employee can access an HR application through the portal without having to log into that application, thereby simplifying the process for the employee and eliminating the need for multiple passwords. The other benefit of an HR Portal is that information can be distributed throughout the organization while being centrally maintained. Policy information and corporate communications can be accessed by all employees regardless of location even though the actual information is stored centrally.

3.5. Knowledge Management (KM)

Knowledge Management (KM) is the umbrella term for the management of unstructured information - that is, all kinds of documents. KM can be defined as the process of capturing, distributing and using knowledge effectively. In order to effectively share an organization's information assets (think: policies, procedures but also expertise and experiences), that knowledge needs to be identified, captured, evaluated and easily retrieved. There are three main approaches to knowledge management:

- Technocentric: Focuses on technology, especially software that boosts knowledge sharing and creation.
- Organizational: Looks at how to design an organization to best promote knowledge processes.
- Ecological: Encourages a knowledge exchange through collaborative networks,

rather than through direct management.

KM with HRIS self-service portal provides an opportunity within your organization to "connect those who know with those who need to know". Its functions may help companies manage all facets of unstructured information - from collaborative authoring and publishing to advanced search and navigation.

Knowledge Management (KM) is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience of individual works.

Researchers suggested that the main ingredient behind successful innovation was not a clever way of thinking or brainstorming. Instead, it was a place where people could share ideas, let them bump into each other, and in so doing, evolve into new, more powerful forms. The coffee-shops of Paris served this purpose during the Enlightenment, allowing for fantastic new scientific and philosophical concepts to be born.

The Japanese, during the 70s, applied this concept to businesses. How, they asked, does knowledge flow, and how can managers and business leaders help? Philosopher Ikujiro Nanaka and others developed a model of knowledge creation that captures all the ways knowledge moves and morphs within a network, and the one main technique that managers can use to encourage its development.

The model suggested by Nanaka's team details the ways that knowledge changes hands and transforms. To begin, he divides knowledge into two types: Explicit Knowledge, which can be described with numbers, science, or manuals, and Tacit Knowledge, the emotional, difficult-to-describe variety. Both kinds of knowledge are necessary, both for everyday living and for business ventures. These two kinds of knowledge interact with four processes: Socialization, Externalization, Combination, and Internalization (SECI).

3.5.1. Socialization

Socialization is the process where tacit knowledge it transmitted between people. Because tacit knowledge is rarely successfully expressed, socialization simply involves spending time with coworkers, enjoying their company and conversation until you learn how they think feel. You learn how they look at their tasks, their perspectives. It's possible – and necessary – to do this with your customers, too. Those who are in a position to interact with the customers directly need to learn the skills needed to see how they think and feel, and through the other processes in the model, transmit that model to other parts of the organization.

3.5.2. Externalization

This process allows tacit knowledge to be morphed into explicit knowledge. Through interaction between an individual and other groups in the organization, the individual's tacit knowledge is expressed through whatever terms are possible, such as metaphors

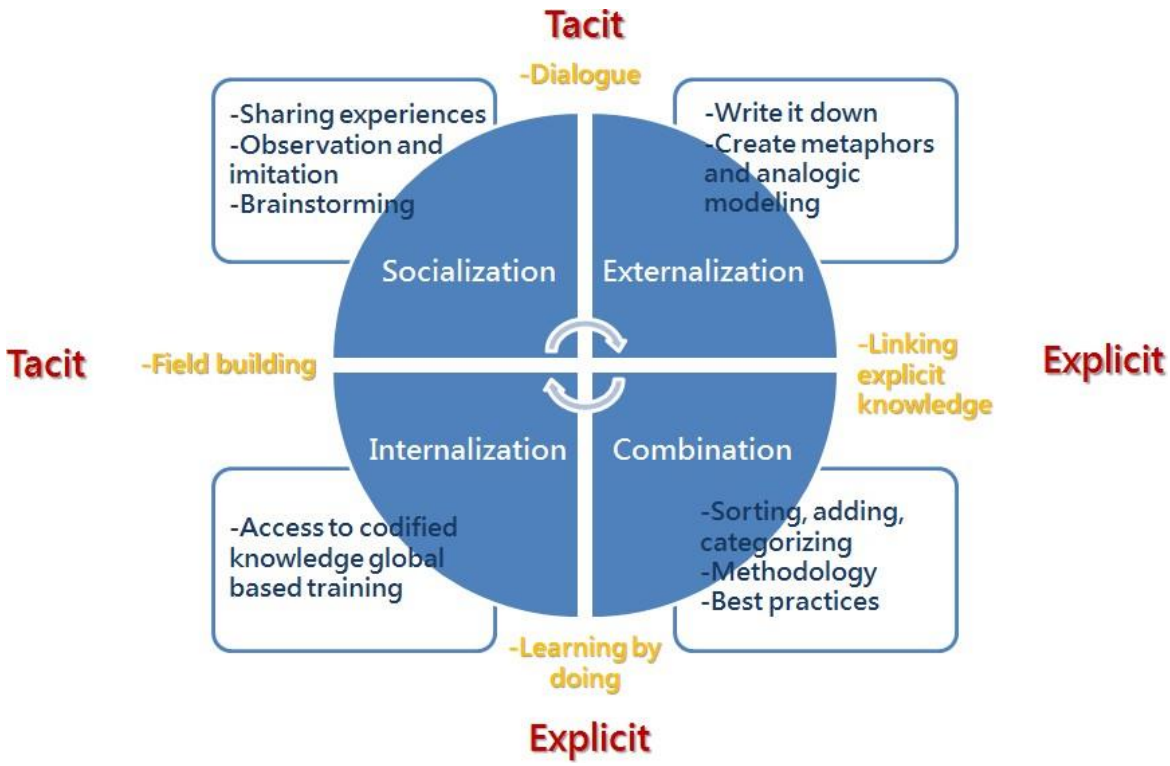
and stories. Effective communication skills are a necessity; developing these and increasing opportunities for externalization are the main ways managers can encourage this process.

3.5.3. Combination

Through teams, or a creative individual, the explicit knowledge injected into the organization is transmuted through the process of Combination. Knowledge throughout the organization is collected and compiled into a more effective form of explicit knowledge, allowing the more refined forms to be distributed throughout the organization. An example would be a team in a tech firm whose job is to publish reports of successful products made throughout the company.

3.5.4. Internalization

Internalization is where the model comes full circle: as we started with an individual sharing tacit knowledge, it ends with the same individual converting the explicit knowledge supplied either by the firm or outside sources into personally applicable tacit knowledge. An HR official runs through this process when he reads the company's training manual for conflict resolution, then puts it into practice. Internalization doesn't just refer to an individual; the collective tacit knowledge of the organization is morphed from its explicit knowledge through internalization.



Source: Nonaka, I., von Krogh, G., & Voelpel, S. (2006). Organizational knowledge creation theory: Evolutionary paths and future advances. Organization Studies, 27(8), 1179–1208.

Now that we understand the main mechanisms whereby knowledge moves throughout an organization, the only piece missing is this: What are we, as managers, supposed to do about it? How can we apply this information? Here, we return with Nanako to the introduction of this article: a space that encourage the flow of ideas, which can allow all the SECI processes to occur. Nanako introduces a concept from Japanese, called "Ba", which generally translates as "Place of_____."

Ba, when applied to business, refers to the concept of having a place for knowledge processes to occur. This place can be physical, virtual, or mental (such as a shared perspective or set of values). Managers' main purpose in knowledge management is to provide this Ba, and to tailor the characteristics of each Ba to the processes it's meant to encourage. For example, if one is trying to encourage Socialization, it would be counterproductive to encourage virtual interaction. Why? Socialization requires face-to-face interaction, as the very act of an individual expressing his/her tacit knowledge transmutes it to explicit knowledge, making it Externalization instead of Socialization. Considerations such as these should become vital to a manager's strategy.

Ba is a powerful tool, and regulated or not, it's an integral component in a company's culture. When underutilized, Ba will develop independent of a manager's direction, and will likely be counterproductive to the company's goals. However, when used properly, Ba can encourage the flow of ideas throughout an organization, and as such, allow for greater innovation and creativity. Enjoy, and good luck, Change makers

3.6. Talent Management Systems

The systems that support the processes of onboarding, recruiting, performance management, compensation management, succession planning and learning management are commonly referred to as Talent Management Applications.

3.6.1. ATS

Recruiting Applications, also known as Applicant Tracking Systems (ATS) or talent acquisition systems, support the process of sourcing and selecting candidates for open jobs. They include the creation of requisitions for the recruitment of a particular job and storing and tracking the résumés of applicants and can include screening of candidates via assessments. Recruiters can use search tools and queries to weed through the mountain of applications for a particular job. Hiring managers are presented candidates for their positions electronically.

Recruiting applications provide benefits on the compliance side as well. Tracking for Affirmative action purposes becomes streamlined. The total cost of sourcing and selecting candidates can be reduced with a recruitment management system. HRIS job and organizational information can be interfaced to the recruitment systems for consistency purposes.

3.6.2. Onboarding

Onboarding refers to the process of hiring the employee into the organization. Applications that support this process include online self-service for new hire paperwork, drug screening, background checks, ordering of equipment (workstations, PC's, phone, company credit cards), and integration with security systems to establish an ID and access. Integration with a core HRMS automates setting up of the new hire in that system. Onboarding systems provide benefits to a company by reducing the amount of time that it takes to bring an employee into the company, making them a more productive worker in less time and reducing the total cost of hire. Many recruiting systems include onboarding modules.

3.6.3. Performance Management

Performance Management refers to those applications that manage the process by which employee's performance is evaluated. These applications can support annual, as well as more frequent review cycles, and they typically include a process for the setting of goals for the organization and the individual. As a result the individual's goals are aligned with the organization goals. These systems include the ability for an employee to perform online self-assessments, as well as manager reviews of their employees. Online automated confidential peer reviews (known as 360 assessments) can also be managed through these applications. These applications rely on the job and organizational management data in the HRMS to build goals of various organizational units and to establish workflow for management approval. These systems provide benefits to the company by eliminating paper-based manual processes, providing information for job and pay decisions and ensuring compliance of the performance management processes.

3.6.4. Competency Management

Competency Management provides the ability to create a set of competencies by job. Ideally the integration of the application will allow the sharing of competencies with performance management for the evaluation of an employee based on the competencies, compensation for the evaluation of jobs and to determine appropriateness of pay, career planning for the identification of career paths, and succession planning to identify successors to jobs based on competencies either demonstrated through a performance evaluation or those tied to previous jobs held. Learning management systems also use competencies for linkages to training activities.

3.6.5. Learning Management

Learning Management includes all of the functions around training employees. It includes establishment of courses and curriculum, scheduling of training events, delivering online training courses and tracking the training taken. It also supports the ability to prescribe learning plans based on the jobs a person is performing or career paths for them to pursue. These systems can provide hard dollar benefits to the organization by offering instructor-led training activities as online courses, eliminating the time and travel expenses associated with face-to-face training and the need for instructors. Other benefits of online training include less time away from ones job and greater availability of training.

3.6.6. Succession Planning

Succession Planning features the ability to assess an employee's fit for their current job, readiness to take on a new job and be potential successors for others. In an integrated suite, performance management and compensation data is included to provide a full picture of the employee's fit to current and future jobs. Oftentimes this is done in a graphical way using organizational charts. When integrated with a learning management system, a person can be given learning assignments to better qualify them for new job assignments.

3.6.7. Compensation Management

Compensation Management refers to those applications that support the job and pay processes within the compensation department, as well as employee pay actions. Within the compensation department these applications support the processes surrounding job creation and evaluation. They include features such as online job descriptions, integration with salary survey providers, and establishment of pay ranges/bands for jobs and support of market pricing or point-based evaluation methods. These systems benefit a company by providing accurate and timely information for the compensation professional and management with regards to how to create and establish pay practices.

Employee pay actions are supported for merit pay, incentive pay and bonus payments. Typically these solutions allow for the provisions of salary plans that are tied to jobs. The employee participates in that salary plan by virtue of being assigned to the job.

Pay for performance processes, also known as merit increase, are typically automated in compensation management systems through manager self-service. Using information found within the core HRMS for job, pay and organizational structure, a manager can make pay actions on their employees. These systems allow for budget management within the merit process for determination and allocation of available budget. These systems eliminate the need for manual spreadsheet based processes, improve accuracy and eliminate the need for manual entry or complex interfaces to the HRMS for the reflecting of these pay actions.

3.7. Workforce Analytics

Workforce analytics refer to strategies for combining data elements into metrics and for examining relationships or changes in metrics. There is a fundamental distinction between "HR metrics" and "workforce analytics". Metrics are data (numbers) that reflect some detail about given outcomes, e.g., success in recruiting new employees. These metrics reflect characteristics of the organization's HR programs and activities. Analytics refer to strategies for combining data elements into metrics and for examining relationships or changes in metrics.

3.7.1. Benchmarking

The Saratoga Institute's benchmarking efforts were the first to develop information on

standard HR metrics regarding the use and management of human capital. Benchmarking data is useful in that it provides insights into what is possible.

However, a challenge in using HR metrics as benchmark data is that an organization's human resource practices and the use of its HR staff reflect current challenges facing that organization. As a result, most organizations have an HR department, but the specific functions performed by these departments vary widely across organizations.

Consequently, direct comparisons of HR benchmarking data from one's own organization to data from other organizations may not provide realistic guidelines for either goal setting or forecasting the potential effectiveness of remedial actions an organization might undertake.

3.7.2. Data Mining and "Big" data

Interest in data mining human capital information has been on the rise since the implementation of integrated HRIS and digitized HRM processes.

Data mining refers to efforts to identify patterns that exist within data and that may identify unrecognized causal mechanisms that can be used to enhance decision making. To identify these causal mechanisms, data mining uses correlation and multiple regression methods to identify patterns of relationships in extremely large datasets. Data mining has a number of important applications, but the caveat with its use is that it can also uncover spurious and nonsensical relationships (e.g., taller employees make better leaders; older employees have longer tenures).

Current interest in Big Data reflects efforts to analyze the extremely large data sets created by many transaction systems. Often these datasets can be many terabytes (2^{10} gigabytes) or more. Many web based applications and transaction sites, like those generated by Amazon.com, Google, and many social media sites generate large numbers of transactions. Efforts in Big Data reflect attempts to mine these very large data sets for patterns that can provide addition insight for managers about customer preferences or process characteristics that managers can use to drive greater sales, higher customer satisfaction and reduce costs.

3.7.3. Predictive Analyses

Predictive analysis involves attempts to develop models of organizational systems that can be used to predict future outcomes and understand the consequences of hypothetical changes in organizations For example, if the organization discovered a correlation between employee job satisfaction and turnover, HR could use this data to suggest modifications to the employees' work situation or their benefits.

Efforts to develop balanced scorecards are examples of elementary predictive systems. They involve identifying leading indicators of important organizational outcomes and the nature of the relationships expected to lead to them. Engaging in efforts to test the assumptions in these models over time can lead to enhancements in the quality of the models' underlying predictive analyses, either by identifying additional leading

indicators or better specifying the nature of the relationships between predictors and outcomes.

3.7.4. Operational Experiments

The evidence-based management movement argues that managers should base their decisions on data drawn from the organization and evidence about the actual functioning of its systems rather than using personal philosophies or untested personal models or assumptions about "how things work." One of the most effective methods for developing the evidence on which to base decisions is through operational experiments conducted within the organization.

Google uses operational experiments to test the effectiveness of the ad words used on its Web site. Rather than simply relying on intuition or "expert judgment" about which ad wording is more effective, it creates an experiment. It configures its site to alternate the presentation of competing ad text to visitors to its site and then tracks the number of "click-through" on the ad for a period of time. Given the large number of daily hits, Google can get objective data on the effectiveness of the various ads in a relatively short time and then adopt the ad wording demonstrated to be most effective.

3.7.5. Workforce Modeling

Workforce modeling attempts to understand how an organization's human capital needs would change as a function of some expected change in the organization's environment. This change may be a shift in the demand for the organization's product, entry into a new market, divestiture of one of the organization's businesses, or a pending acquisition of or merger with another organization. This process involves establishing a human resources planning program.

3.7.6. Strategic Realignment

Strategic realignment involves the set of activities most commonly known today as human resource planning. These planning efforts focus on long-term plans for needed strategic changes in the organization. Strategic realignment also extends the use of HRM analytics to planning for new situations and circumstances, i.e., mergers, acquisitions, divestitures, or entries into new geographic or product markets.

3.7.7. HR Reporting

For individuals conducting metrics and analytics work, paying attention to the capabilities and needs of the targeted audience is critically important. The information reported must be relevant to the issues facing the managers who receive it. Further, simply providing numbers to managers is unlikely to be of much use to them until they can understand the meaning of the information for their decision situations.

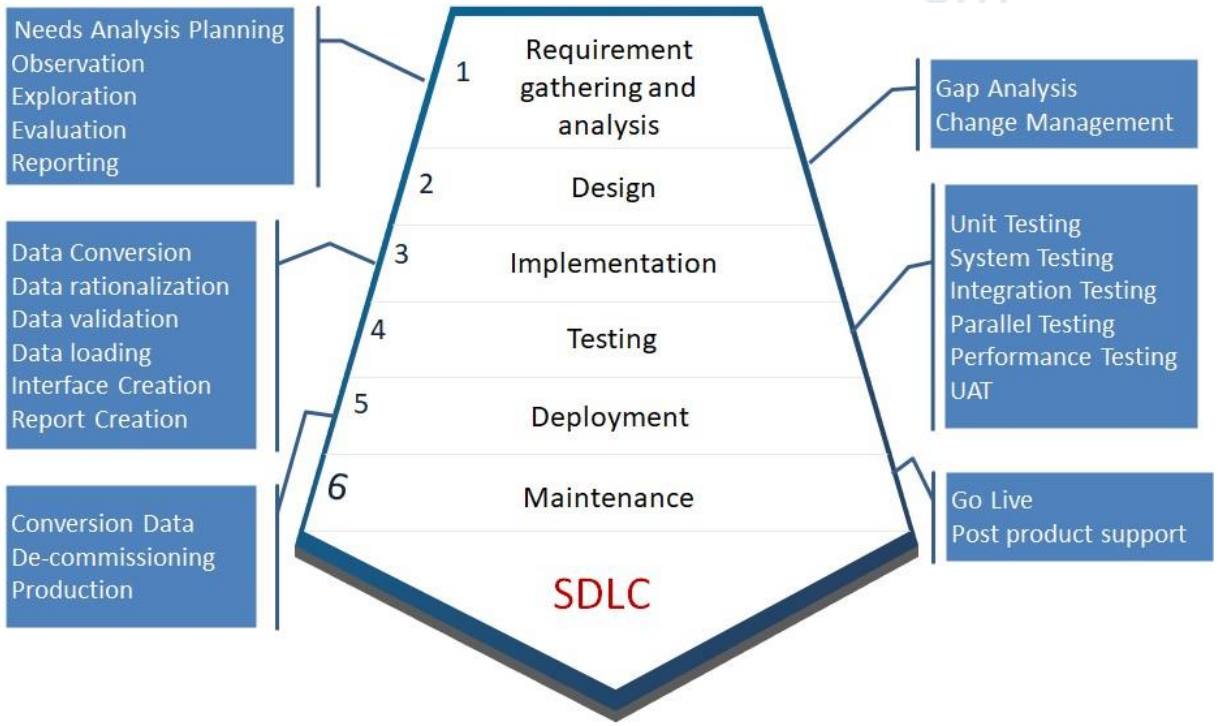
HR metrics and analytics information can be reported in a number of ways. Generally, a combination of "push" and "pull" means of communication will work for most organizations. Push systems like email are excellent for getting information to decision

makers. Pull systems are ways of making information available to managers so that they can access any of it at a point in time when it will be most useful for their decision making, e.g., posting HR metrics and analytics analyses and reports on internal company Web sites.

Please note that the primary objective of developing capabilities in HR metrics and workforce analytics is to increase organizational effectiveness. It is not simply to generate a static menu of HR metrics reports or dashboards. Dashboards are a component of reporting. Dashboards reflect efforts to align real-time analysis of organizational and HR processes as well as an increased capacity to aggregate organizational data.

4. Development of HRIS

From the engineering and information processing literature, the formal design of any information processing system is supposed to follow a set of steps labeled the System Development Life Cycle (SDLC). However, the traditional SDLC is somewhat difficult to use as originally specified. But there is agreement that the SDLC has six general phases: (1) Requirement gathering and analysis, (2) design, (3) implementation, (4) Testing, (5) Deployment, and (6) maintenance.



4.1. Requirement gathering and analysis

Business requirements are gathered in this phase. This phase is the main focus of the project managers and stake holders. Meetings with managers, stake holders and users

are held in order to determine the requirements like. Who is going to use the system? How will they use the system? What data should be input into the system? What data should be output by the system? These are general questions that get answered during a requirements gathering phase. After requirement gathering these requirements are analyzed for their validity and the possibility of incorporating the requirements in the system to be development is also studied. Finally, a Requirement Specification document is created which serves the purpose of guideline for the next phase of the model.

Need analysis can he describe as the process of gathering, prioritizing and documenting an organization's HR requirements. Firstly study of "as is" conducted and identified the current processes in the organization. Interviews, focus groups. Surveys and online tools are some methods used in current analysis. Then to be" study is conducted to identify the ne processes implementation in HRIS. Next step is gap analysis. In gap analysis, current state of the HRIS is compared with the desired future state based on the needs that are not satisfied with the current system and determine system requirement for the new system. An effective needs analysis consists of five main stages, each of which has activities that will be discussed in detail:

4.1.1. Needs Analysis Planning

The project team is assembled and prepares to investigate the current and desired system applications and functions. Once the team is in place, they can begin arranging to conduct a thorough investigation.

4.1.2. Observation

During the observation stage, analysts impartially observe the current systems and processes, forming the basis for later recommendations. At this point, the investigation is at a high level; more detailed data will be gathered later, during the Exploration stage. It is important for the analysts to interact with employees at all levels in the areas that may be affected by the changes during observation.

4.1.3. Exploration

The exploration stage of the needs analysis process builds on the analysis completed in the observation stage and involves gathering additional and more detailed data regarding HR processes. Remember that the problems must be defined clearly before any suitable solutions may be determined. The major thrust of the exploration phase is collecting the data. There are multiple data collection techniques to consider:

- Interviews

The goal of conducting interviews is to find representative employees that can effectively communicate the key HR practices and processes to the analysis team so that they can develop a thorough understanding of current HR operations.

Interviews can be completely unstructured or very scripted. Unstructured interviews is

when a general topic is introduced for discussion and the interview lets the interview progress naturally.

In a Structured interview, the interviewer asks specific questions in a predetermined order and respondents select from a set of alternative answers.

- Questionnaires

Questionnaires are structured data-collection tools that must be designed and implemented carefully in order to obtain usable results. Before the questionnaire is implemented, the purpose and importance of each question should be determined. Employee time is valuable, and no question should be included unless it serves a clear purpose that helps the analysts better understand HR data or processes.

Before launching the questionnaire to employees, the questionnaire should be tested to ensure that the questions are clear and understandable, and that they are collecting the needed data

Questionnaires also have several advantages and disadvantages. For example, they can be distributed to large groups quickly and easily. In addition, questionnaires are much less time consuming than observing or interviewing employees. Questionnaires also lend themselves to easier analysis and can be more convenient for employees

Questionnaires do have shortcomings, Compared to interviews, questionnaires have much lower response rates, and lack personal interaction and body cues

- Observation.

Because observation takes place in the actual work environment, information is obtained within the context in which HR activities occur. Observation is most useful when trying to determine what employees do and in what order.

Prior to observing employees in the work setting, it is important to determine the activity to be studied and to collect and review any documentation available (e.g., mission statements, organization charts, position descriptions, current systems processes, policies, etc.).

Observation has its limitations, though. First, it is important to account for the fact that even with a well-trained and effective observer who attempts to remain unobtrusive, his or her presence alone may subtly affect how the employees go about their work. Second, observation is not as effective for high level jobs where the process and outcome of work is not as easily seen.

- Focus Groups

A focus group consists of a sample of people representing a larger population who gather together to discuss a topic; in this case, the topic would relate to the HRIS. Focus groups are important because they can provide as deep of information as

interviews, but it has the added advantage of bringing people together, which can lead to greater and more effective information sharing than if only interviews were utilized.

4.1.4. Evaluation

Several activities occur during the evaluation stage of needs analysis.

Once the data have been collected, they must be reviewed and assessed to create a clear picture of the current and desired processes, data sources, and issues. Next, the data should be arranged in a format useful for the next phase of the SDLC: design. Third, the data should be reviewed by the project team to gain additional perspective and encourage suggestions, noting any duplications or omissions. When this information is organized, it can then be prioritized according to the immediacy of need, and the level of importance of the functionality the data represents.

4.1.5. Reporting

The final stage of the needs analysis process, reporting, involves preparing a report that summarizes the findings and presents recommendations for the design phase. The final report should include an overview of the current systems and processes, along with a description of how a new system could address the issues and weaknesses with which the function deals. This report should contain the formalized requirements definition, the document that lists each of the prioritized requirements for the new system.

The requirement definition can include specifications geared toward solving problems identified in the analysis as well as any that focus on new functionality that HR requires in the new system. These requirements should be written in such a way that when the new system is tested, each requirement can be verified as being met

4.2. Design

In this phase the system and software design is prepared from the requirement specifications which were studied in the first phase. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture. The system design specifications serve as input for the next phase of the model.

The design phase where the business requirements become configuration and system specifications. In this phase the Subject Matter Experts and the Functional Product experts work out how the system will be configured to meet the stated business requirements. Gap lists are created for those business requirements that are not met with standard configuration. This is also the phase where reporting requirements will be established. When creating the design of the application and new processes that are being introduced, perform an impact assessment. This assessment identifies the impact of the changes as a result of the new system and processes. These impacts form the foundation of the change management plan, which will address how the organization will be prepared for the changes to be introduced.

This phase ends when all of the business requirements have been addressed and the change management assessment is complete.

4.3. Implementation

On receiving system design documents, the work is divided in modules/units and actual coding is started. Since, in this phase the code is produced so it is the main focus for the developer. This is the longest phase of the software development life cycle. This is where the configuration of the application occurs, reports are created, and interfaces and conversion programs are developed. Any application customizations that have been approved to be developed are also in this phase.

This phase also called build phase which task cannot be started until the related design phase task is completed. However, the entire design phase does not have to be completed before the build phase begins. To accelerate the delivery of the application it is common for build phase tasks to start immediately after the related design tasks and the two (2) phases run simultaneously until all of the design work is completed.

4.3.1. Data Conversion

Data Conversion is the process of moving data into the new system from the source. The source could be an older system, Excel spreadsheets or even paper files. The process is typically run during the build phase; however, in some methodologies there is a separate data conversion phase. Regardless of where it falls, there are some core steps in data conversion that need to take place: data rationalization, data validation and data loading.

4.3.2. Data rationalization

Data rationalization is the process that reviews the data content and makes sure the values, format and use are consistent with what the new system is capable of storing. When differences are found, a process needs to be created that modifies the data to what is required by the new system. How this is accomplished will depend on how much data is to be changed and the tools available to perform the data conversions. If there are large amounts of data and resources available, programs can be built to convert the data into the new formats. If the amount of data that needs to be changed is not large, it is often more cost and time effective to change it manually either on the data load files or once it is loaded into the system.

4.3.3. Data validation

Data validation is the process that reviews the accuracy of the data to be loaded into the system. This involves checking the files that are created from the source data to make sure they have captured all of the information that is to be converted. It includes assuring the data from the source is correct once it gets loaded into the new system. Be sure to check both record checks, as well as actual data checks. When performing record checks, count the number of records that are going into the system and a count of the records that actually went into the system and validate for accuracy. Look at the

data once loaded to see that the values are accurate. This is not always a manual process and there are many tools available to perform these validations. The specific tools that are available for use are, in part, dependent on the HR system being implemented; it is best to work with the vendor and IT department to identify the tools available for performing data validation.

4.3.4. Data loading

Data loading is the process of actually putting the data into the system. Most of the time this will be performed in an automated fashion; however, if there is a small amount of data or it is currently. When running automated programs, it is a best practice to load the data in stages. The first test data load is much like a program unit test, as the testing is assuring that the load programs work; therefore, use only a small sampling of data for this exercise. The next test data load will begin to test the data conversions that are taking place and increase the amount of data that is loaded to get a representative sample for validation testing. Subsequent data loads will increase the amount of data with the end result being a load of the entire data base. Perform the entire database load from end-to-end to determine that the data load is possible and can be performed within the conversion time frames. Multiple full loads of data are common to prepare for the final production load, which should proceed without error and within the prescribed time frames.

4.3.5. Interface Creation

Interface Creation is often a large component of the build phase. An interface must be built for all systems that send data to or get data from the new system. Often there are existing interfaces that can be leveraged and just modified to meet the new requirements; other times the new system requirements are materially different and a new interface needs to be developed. A new implementation is a good time to investigate the use of these technologies as it will dramatically simplify the operations of the new application. Interfaces must be included in integration testing in order to fully test the end-to-end processing in the application.

4.3.6. Report Creation

Report Creation is an important task in the build phase. As soon as the system is live, users will want to report on the data that is stored. While most applications come with a standard set of reports, during the requirements gathering session custom reports will be identified. Of all the areas in an implementation, this is the one that is most commonly sacrificed when time or resources are not available. This leaves reporting as a “post go live” activity and can damage the perception of the implementation. Care must be taken when testing the reports that enough data is available in the test systems. A lack of representative data can lead to report results that are not acceptable when run with a larger set of data.

4.4. Testing

After the code is developed it is tested against the requirements to make sure that the

product is actually solving the needs addressed and gathered during the requirements phase. During this phase unit testing, integration testing, system testing, acceptance testing are done. Testing includes all of the testing that is required to assure the system is implemented properly. There are functional tests which test that the processes are working as expected from a user perspective, and technical tests which test that the processes are working from an application program perspective.

4.4.1. Unit Testing

This is a technical test where each program is tested independently to make sure that it is sound before it is tested within the broader aspect of the application.

4.4.2. System Testing

Both functional and technical testing occurs. The functional testing team and the technical testing teams work together in this phase to make sure that each individual program works within the context of the system configuration and a test sampling of data. During systems testing, programs are tested within the system with test data to make sure that it logically produces the correct result. A program that has been unit tested may be technically sound, but when run within the system may not produce the desired results.

4.4.3. Integration Testing

This includes both functional and technical testing. The functional testing team and technical testing team will work together in this phase to make sure that the individual programs and processes work when run end-to-end typically with a larger test sampling of data than in the System Test phase. A program that ran correctly when system testing may not perform as expected when put in context of the entire process.

4.4.4. Parallel Testing

Provides a functional and technical test whose objective is to see if the results of a process in the current system are the same when the process is run in the new system. This is a very common test to perform when implementing a payroll application. The payroll that is run in the current system is also run in the new system. The outputs are compared to make sure that the pay checks match for the people paid.

4.4.5. Performance Testing

This is a technical test that is conducted to make sure that the application will perform at acceptable levels for both online response and any background or batch processing.

4.4.6. User Acceptance Testing (UAT)

Functional testing occurs in this final test phase. This is the phase where Business Functional Experts run tests against the application to make sure it meets their stated requirements. While they may have been involved in the system or integration testing,

this testing has a different purpose. They are testing to obtain a formal sign off that the project has met the requirements and the application is ready to move into production.

4.5. Deployment

After successful testing the product is delivered / deployed to the customer for their use, called “Go Live”. This is the phase when everything is ready for the application to be put into production for active use. There are many activities that occur to ready a system and its users for the move into production. Some key activities include:

4.5.1. Staging of Conversion Data

The processes to prepare the final data load for conversion and converting the data before the system is made available for production use.

4.5.2. De-commissioning of systems

The new HR system will most often be replacing older systems. Before going live with the new system the systems that are being replaced must be turned off. Interfaces that are sent to these systems must be stopped.

4.5.3. Preparation of the Production Environment

Before allowing the new system into the production environment the IT Staff must prepare the environment for the acceptance of the new software, data and end users. Typically the IT department or the vendor will provide a “go live check list” that will be completed to make sure that the database, operating system, network components and job scheduling devices are readied for use.

4.6. Maintenance

Once when the customers starts using the developed system then the actual problems comes up and needs to be solved from time to time. This process where the care is taken for the developed product is known as maintenance.

This is the support the project team will provide after the system is live in the production environment. Before turning over the application to the operations team and application owners, the core project team will typically provide support for a designated period of time. This is done to make sure that once in production the system is operating as expected. When the post support period is over, the core project team will transfer the application support to the appropriate owners. The length of time that the core project team supports a system post production will differ by company and project. Typically, however, this is typically four (4) to six (6) week duration after go live

HR department can apply the main concepts and phases of the traditional SDLC to the HRM function. The HRIS development process refers to the steps taken from the time a company considers computerizing its human resources functions through the needs analysis, design, development, implementation, maintenance, evaluations, and improvement of the system.

In contrast to SDLC (called waterfall), the agile development approach uses iterative development as a basis but advocates a lighter and more people-centric viewpoint. Agile processes use feedback, rather than planning, as their primary control mechanism. The feedback is driven by regular tests and releases of the evolving software.

There are two critical points that should be emphasized the stages of waterfall or agile system development approach. One, the system development process begins when the company first begins to consider computerizing its HR functions. It is important to document this beginning of the process so that it can be considered when the system is being evaluated and maintained. The second critical point is the importance of the evaluation and, as needed, improvements to the system. This evaluation must be continuous and occur not only after the system has been implemented but also at every stage of the development. The quality of these evaluations of the system will depend heavily on the documentation of the stages of the entire system development process. The documentation of the planning and development of a system is one of the most important determinants of successful system implementation, and continued improvement.

5. Selection of HRIS

The selection of an HRIS is a stressful situation as so many options exist. Picking the options that are best for your needs at your company is challenging. Wading through the information provided by each system is challenging, too.

The sales people are often commissioned sales people who verbally may tell you that the system will meet your needs. Make sure you check this out with multiple sources including current customers, online discussion groups, LinkedIn, other HRCI members, and Google reviews.

5.1. Functionalities of HRIS

Typically, the better Human Resource Information Systems (HRIS) provide overall:

5.1.1. Management of all employee information.

Data such as names, titles, addresses, and salaries are a basic start. Salary and position history, reporting structures, performance appraisal histories, and other critical employee information.

5.1.2. Company-related documents

Company-related documents such as employee handbooks, emergency evacuation procedures, and safety guidelines.

5.1.3. Benefits administration

Benefits administration including enrollment, status changes, and personal information updating. In an ideal system, you can allow employees to look up and review their own information, including vacation tracking.

5.1.4. Payroll administration

Complete integration with payroll and other company financial software and accounting systems. When these are connected, you can ensure that paychecks are correct. There is never disconnect between what the official pay rate is and the information that payroll has. If the systems don't integrate, it's easy to update a salary in one system and not in the other.

5.1.5. Applicant tracking and resume management

When your system is seamless, the recruiter can click a hired button and all of the information from the applicant is transferred to the employee side of things. This saves so much time because your data entry and paperwork practically disappear. If an applicant puts in his own information when applying, you can ensure accuracy. If the offer letter is generated out of the same system as the payroll system, the salary will match perfectly and there is no misunderstanding.

5.1.6. Performance development plans

It's not just enough to have plans, if they are recorded in a central system, then they can easily follow the employee from position to position. Senior leadership can run reports to see where people are and what their individual bosses are planning for their futures.

5.1.7. Disciplinary Actions

Disciplinary Actions: It's important to keep track of who has been suspended, demoted, or had other negative actions taken against them noted—even after the employee leaves your organization. When a company calls and asks for a former employee reference, it's easy for an admin in the HR department to look up and report back whether or not the person is eligible for rehire.

5.1.8. Training records

Training records is especially critical in a company where certifications and licenses are required. In other companies, training records may not have that level of importance, but you may still find that having the information is useful.

5.2. Gap Analysis

Gap analysis refers to the difference between the current state and the desired future state. An effective HRIS provides information on just about anything the company needs to track and analyze about employees, former employees, and applicants. Your company will need to select a HRIS and customize it to meet your needs. If your company is on a growth path, choose a system that can grow with you.

It's fairly inexpensive to implement a basic HRIS, but make sure whatever you implement meets your company's actual needs. Do you want to be able to run turnover

reports? Post organizational charts?

Allow managers to electronically access previous performance appraisals? Do you want everything to have to be done through the HR department or would you like managers to access the information themselves?

With an appropriate HRIS, Human Resources staff enable employees to do their own benefits updates and address changes, thus freeing HR staff for more strategic functions. Additionally, data necessary for employee management, knowledge development, career growth and development, and equal treatment is facilitated.

Finally, managers can access the information they need to legally, ethically, and effectively support the success of their reporting employees. They can run their own reports and enter plans into the system to help with succession.

5.3. Design Considerations

Once an organization has decided to implement technology in its overall HR strategy, it must determine whether to use a single platform, an integrated technology solution to support multiple HR functions or multiple smaller systems—sometimes known as best-of-breed (BoB) solutions, each supporting a different HR function.

5.3.1. Integrated solutions

With this strategy, a single vendor helps the organization develop one platform that incorporates multiple HR functions. Often these platforms are part of an enterprise-wide information system architecture that includes a variety of business functions such as a general ledger, customer relationship management and logistics.

5.3.2. Best-of-breed (BoB) solutions

Organizations that implement a BoB strategy pick the best applications for each HR functional area, working with one or more vendors. For example, the organization might use a recruiting solution from one vendor, a time-and-attendance program from a second, and a payroll system from a third. Smaller businesses with limited resources or those that want to use technology selectively as part of the overall HR strategy, might prefer this approach. The organization must also consider how the technology will be delivered. Options include:

On-premise or purchase and install. The organization will purchase and install hardware and software on internal machines that internal IT staff support.

Hosted or application service provider. The organization purchases applications that are located at the vendor's site and supported by external IT staff.

Software as a service (SaaS). The organization subscribes to software that is developed and deployed remotely and accessed via a Web browser. Vendors offer many organizations access to the same package (known as multitenancy) and maintain the

software for each organization.

5.3.3. HR Portal

One of the most significant changes in the practice of HR management has been the "democratization" of HR data, expanding access to employees, managers, health insurers, workers' compensation carriers, senior executives, job applicants and regulatory agencies. These diverse users have unique needs that various solutions are designed to meet.

An HR portal provides a single, targeted and often customized access point for each employee (and increasingly, each job applicant). The HR portal allows an individual to access the necessary resources and data for his or her circumstances and position, enabling each to design an interface that displays the most relevant data. Most HR portals are also Web-enabled, so employees can access HR services anywhere and anytime on a variety of mobile devices.

Employee self-service (ESS)—often provided through the HR portal—enables employees to access and maintain their personal HR information and to directly conduct many HR transactions. A well-designed ESS allows employees to make informed decisions and become much more self-sufficient.

Another tool accessible via the HR portal is a manager self-service (MSS) application, which enables supervisors to conduct many HR transactions online and generate real-time reports. Organizations can determine the number and complexity of HR tasks in the MSS. For example, managers could authorize merit increases, promotions and transfers; approve leave requests; change an employee's classification; and conduct performance management, succession planning and onboarding.

5.4. Vendor Selection

Although developing technology in-house is possible, using external vendors is generally more cost-effective and often provides a more comprehensive HR solution. However, the wide selection of vendors and variety of products can be daunting.

When an organization purchases a new HRIS system, it is entering a new business partnership, so choosing the right vendor is as important as choosing the necessary software.

HRIS software packages vary greatly in scope and functionality; therefore, organizations should select a vendor that will take time to gain a better understanding of the organization's processes and functional needs.

The HRIS market includes software providers that sell systems directly and resellers that provide consulting and installation services for third-party applications. When working with a reseller, HR should look at the vendor's software update and new release history to gain insight into its commitment to its offerings. Any reputable developer or reseller should provide references from current clients of similar size with comparable business

processes.

The key to selecting a system that works for the company is having a clear and concise requirements definition document. This should have two (2) main components: the business user requirements for the application and the technical/ infrastructure requirements. The business users requirements help select the system that will support the business process and objectives. The technical requirements will help select a product that will fit into the current infrastructure.

5.4.1. Business requirements

Business requirements should have enough detail to provide a prospective vendor with information on required processes, what data and processes are important and how the application will be used. These requirements will be used as the input for the RFI/RFP, vendor demonstration scripts and as a guide to evaluate fit to product.

Specifically the business requirements need to address the needs of the HR Process owners, subject matter experts, end users and management team:

HR process owners are those who are responsible overall for the process. This is typically a functional management position like a Director of Compensation or a Payroll Manager. They are the people who have the decision-making ability if the process or the system that supports the process were to change. Their requirements tend to be higher level and tied to how they need to support their business partners.

Subject Matter Experts (SMEs) are those persons who are experts on the process and usually work the process on a daily basis. They are typically the job experts, as well, such as a Compensation or Benefits Analyst. Their requirements will include how the process should work optimally, reports that are necessary to provide to management, as well as an understanding of what exceptions occur that would need to be accommodated.

End users are those persons who use the process but are not experts in the subject matter. They are the managers and employees who have to complete the merit increase forms, benefit elections or new hire paperwork. They are going to give a perspective of how easy the process is to execute, the accuracy of information provided to/from the process and where there are areas of improvement from a usability perspective.

Management refers generically to those in management who require information for decision making. They are going to give the perspective of what reports and information are required from the process. They will also be able to provide a perspective on how this process supports the business from a more macro level.

5.4.2. Technical requirements

Technical requirements will differ depending on what type of software delivery model is to be purchased.

Licensed Software On-Premise refers to any application that will be installed and supported on premise within the company's IT infrastructure. A technical requirements specification sheet that includes information on required database, operating system, and hardware provided by the IT Department will need to be created. Ask the vendor to provide information on the frequency of system updates and any planned major releases in the next 12 to 14 months.

Licensed Software Hosted is an option for licensed software if looking at having it hosted in a data center outside of the company. Make sure that the technical requirements meet those of the hosting provider. Also make sure that the software vendor does not prohibit the hosting of software by a third party or has any fees or other conditions in a hosting arrangement that could make this method more costly or difficult to manage.

NOTE: Have a separate requirements document for the hosting provider to make sure the right vendor is selected. As requirements may vary from one company to another, work with the IT Department on the specifics of the requirements.

Application Service Provider (ASP) or Software as a Service (SaaS) are applications to be delivered as a service and the database, operating system and hardware requirements do not need to be compatible with the company in-house infrastructure. The vendor will be responsible for all technical components. What is important is that the company's information is going to be secured and the vendor has proper change management and business continuity plans in place. Assure this by requesting a "SAS 70" report of the vendor. This report will outline the levels of security that are provided for data protection, firewall and application intrusion. Obtain a copy of the vendor's backup and recovery procedures along with an understanding of the processes that will be followed, and the duration it will take to restore production in the event of a disaster. The IT operations team will be able to assist in gathering the information needed to query the vendor to provide the company a level of confidence of safety and security.

5.5. Vendor Demonstrations

After selecting the vendors whose products closely meet the company's needs, have them perform a demonstration of their product. This will help in understanding how the vendor's system is used. This demonstration should show how the product will work within the company's organization, processes and data. It must be conducted so that there is a clear understanding how the organization would be using the product. Therefore, emphasize with the vendors that they cannot do a "canned" demonstration. The demonstration must be reflective of the company's needs. The best way to achieve this is through the scripted demo.

5.6. Vendor Evaluation

After the demonstrations have been scored, the proposals read and any other due diligence (references or site visits) completed, each vendor proposal must be reviewed against the other in order to select the best product for the business need. To avoid a

subjective or purely emotional decision from occurring, assemble data on the due diligence activities into a vendor evaluation matrix. This matrix should include the decision drivers, highest priority business requirements and scores for the vendors against these criteria. The matrix should have appropriate weightings assigned to each area so that the highest priority decision drivers and business requirements have the greatest influence on each vendors overall scoring.

When completed the vendor evaluation matrix will present a numerical score for each vendor that represents their overall fit to the organization's needs. The vendor with the highest score should be considered the one with the best fit. However, the scores may be so close that there is no clear leader. When this occurs be prepared to analyze the vendor scores and look for those factors that truly differentiate one vendor from the other based on the highest priority decision driver requirements.

6. Project Management

Project management is not just for information technology, engineering or construction projects. Organizations have all kinds of projects, and people from all sorts of disciplines can utilize project management – including HR practitioners. And while some people are pure project managers, most organizations tend to prefer project managers who have at least some functional knowledge of the domains in which they manage projects.

Project management is defined by the Project Management Institute (PMI) as "the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements." A project is really any kind of "temporary endeavor undertaken to create a unique product, service, or result." In an HR context, any fairly major initiative of a temporary nature related to human resources management would likely count as a project. Examples might include implementing a new human resources information system (HRIS), staffing a new production facility, developing a new competency framework, updating an employee handbook, handling the people side of a merger or acquisition or leading and implementing an organizational change initiative.

6.1. Project Roles

There are five (5) formal roles to be performed in any project: Project Sponsor, Steering Committee, Project Manager, Core Project Team and Project Stakeholders.

6.1.1. Project Sponsor:

The Project Sponsor is typically a key person in the organization who has the ability to identify, promote and complete change. This person must have an understanding of the importance of the project, be willing to make tough choices, must have the confidence of key stakeholders, and have enough clout to be trusted by and have access to senior management. The Project Sponsor must have the time to invest in the project to serve as a source of support and conflict resolution, and approve any major changes to project scope.

6.1.2. Steering Committee:

The Steering Committee is comprised of persons from a variety of areas within the organization that are impacted by the project and that are committed to its success. Members should be credible in the eyes of the organization and be familiar with the key issues affecting the organization.

The Steering Committee collectively decides the major project objectives, schedules, and priorities and is responsible for the overall success of the project and for ensuring needed resources. Other responsibilities include resolving escalated project issues, approving and monitoring project and budget status, assessing the organizational impact of the proposed changes and facilitate obtaining commitment of necessary resources.

6.1.3. Project Manager:

The Project Manager is responsible for the overall success of the project and directs the project from beginning to end. He/she is responsible for breaking down the project activities into manageable tasks; obtain appropriate resources and management of those resources. A good project manager will be a master at balancing the demands of scope, time, cost, risk and quality.

The role of a Project Manager is to plan the project, staff the project, manage the Core Project Team, ensure communication and manage scope.

6.1.4. Core Project Team:

There are many people who are involved in a project; however, there is a core set of individuals that are responsible for the majority of the tasks and these people make up the Core Project Team. Individuals that make up this team are often allocated 100% to the project. The team will be made up of people who either have specific technical expertise in an area or specific business expertise in an area. There are many roles that may be included in these project teams as they are dependent on the type of project being managed. Information specific to project teams for systems implementations are discussed in Chapter Five.

6.1.5. Project Stakeholders:

These are the individuals who are impacted by the project. They can be a user of a system, a manager of a functional area or a vendor who is involved in the processes. Stakeholders are often the knowledge experts in a particular area and, as such, are resources to the project team, but not directly assigned to the project. They need to be made available to the project team and actively participate in the project. The success of a project is dependent on managing the expectations of the Project Stakeholders. They need to be included in the communications plan so they can be informed of the project status, project impacts and project schedule.

Each project will establish stakeholders based on the nature and scope of the project. In general, stakeholders include Business Partners, Subject Matter Experts, Technical Experts, Senior Management, Auditors and Outside Vendors.

6.2. Project Organization

There are three (3) main ways to organize a project: function based, project based or matrixed based. How to organize the project will depend on the type of project, and the matrixed based. How to organize the project will depend on the type of project, and the methodologies and philosophies within the company.

6.2.1. Function-Based

The Function-Based project team is staffed with people from the same department. All the resources needed for the project team come from the functional organization. The biggest advantage to this structure is that there is usually clear authority since the project managers tend to also be the functional managers and they do not have to negotiate with other organizations for resources. Other advantages of this organization are that the team members tend to be familiar with each other since they all work in the same area. The team members also bring applicable business knowledge to the project.

A major disadvantage of the functional organization is that functional area may not have all of the specialists needed to work on a project or may not be able to be dedicated to the project as they may have other responsibilities in the functional organization, which can impact the time line of the project deliverables.

6.2.2. Project-Based

The Project-Based organization is staffed with resources dedicated to the project team. These resources have been removed from their functional departments to work on this project. This is especially practical when a large program has dozens or hundreds of people assigned over a long period of time. Advantages include clear authority, since the project manager is also the functional manager, and a clear focus, since everyone on the team has only the project for their primary responsibility.

The main disadvantage is determining how to reallocate people and resources when projects are completed. In a functional organization, the people still have jobs within the functional department. In a project-based organization, it is not so clear where everyone will be reassigned when the project is completed.

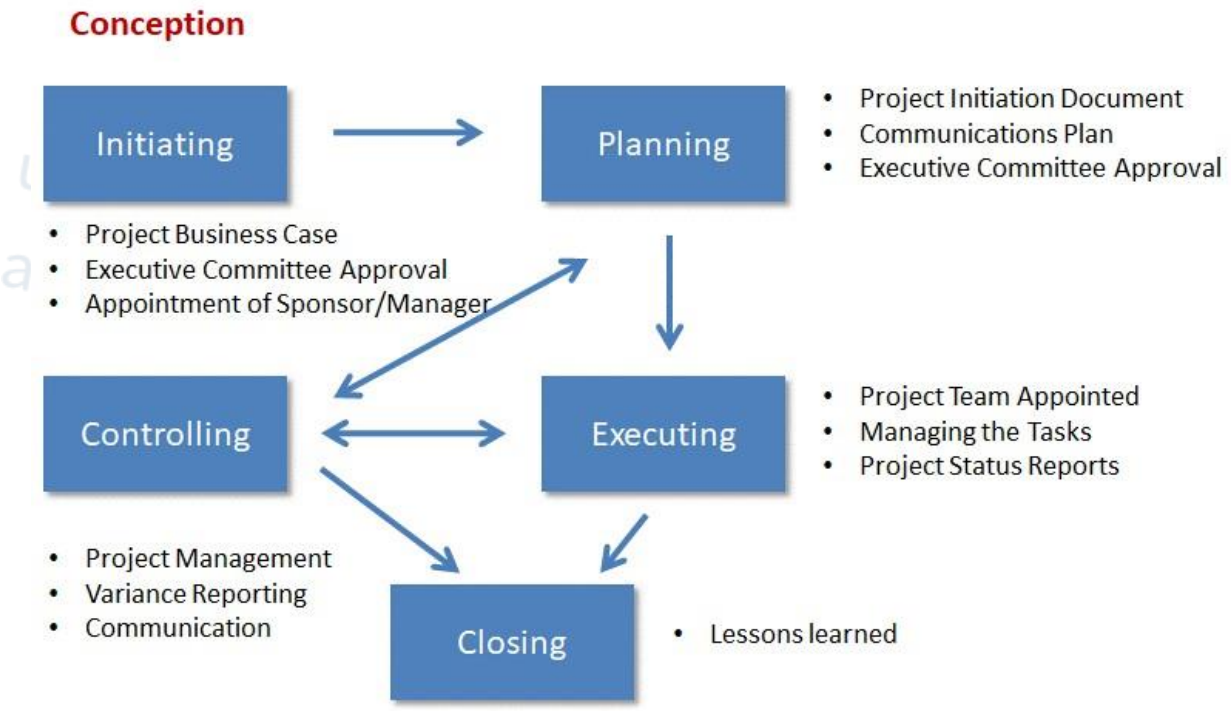
6.2.3. Matrix-Based

The Matrix-Based organization allows functional departments to focus on their specific business competencies and allow projects to be staffed with specialists from throughout the organization. It is common for people to report to one person in the functional organization while working for one or two project managers from other departments. The main advantage of the matrix organization is the efficient allocation of all resources, especially scarce specialty skills that cannot be fully utilized by only one project. The matrix-based organization also is the most flexible when dealing with changing business needs and priorities.

The main disadvantage is that the reporting relationships are complex. Some people might report to a functional manager for whom little work is done, while actually working for one or more project managers.

6.3. Project Life Cycle

The project management life cycle consists of five as phases: Initiation, Planning, Execution, Control, and Closure:



6.3.1. Initiating the Project

An idea for a project will be carefully examined to determine whether or not it benefits the organization. During this phase, a decision making team will identify if the project can realistically be completed.

6.3.2. Planning the Project

A project plan, project charter and/or project scope may be put in writing, outlining the work to be performed. During this phase, a team should prioritize the project, calculate a budget and schedule, and determine what resources are needed. Two important project artifacts include the Project Charter and Project Plan.

The Project Charter is a document that is used to initiate a project and describe exactly what the project is trying to achieve. It will be the foundation for all subsequent project deliverables and used to manage project scope.

The project plan is a formal, approved document used to manage and control project execution. The plan is essentially a list of tasks to be performed for delivery of the project objectives. The tasks are grouped into phases and the phases contain milestones. Milestones are those tasks that when completed signal a significant accomplishment in the project. Milestones can indicate the end of a phase or the end of a series of critical tasks within a phase. The specific phases that the project will contain will be determined by the type of project being undertaken.

6.3.3. Executing the Project

Resources' tasks are distributed and teams are informed of responsibilities. This is a good time to bring up important project related information.

6.3.4. Monitoring and Controlling the Project

Project managers will compare project status and progress to the actual plan, as resources perform the scheduled work. During this phase, project managers may need to adjust schedules or do what is necessary to keep the project on track.

6.3.5. Closing the Project

After project tasks are completed and the client has approved the outcome, an evaluation is necessary to highlight project success and/or learn from project history.

6.4. Major roles for a Project Manager

A project manager is the person who has the overall responsibility for the successful initiation, planning, design, execution, monitoring, controlling and closure of a project. The project manager must have a combination of skills including an ability to ask penetrating questions, detect unstated assumptions and resolve conflicts, as well as more general management skills. Key among his or her duties is the recognition that risk directly impacts the likelihood of success and that this risk must be both formally and informally measured throughout the lifetime of the project. There are three major roles for a project manager:

6.4.1. Interpersonal

The project manager is a leader and a liaison. The top priorities are building team norms and fostering harmony.

6.4.2. Informational

The project manager is a spokesperson who gathers and disseminates information and is responsible for helping team members communicate effectively across all areas of the organization.

6.4.3. Decisional

The project manager allocates resources, negotiates differences, and encourages project progress.

6.5. Project Management Knowledge Areas

There are nine project management knowledge areas identified on Project Management Body of Knowledge (PMBOK Guide) by PMI, which are used throughout the project management processes.

6.5.1. Project Scope

Project Scope is concerned with the work of the project, and again clarifies the boundaries of what is not included. The processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.

6.5.2. Project Time Management

This knowledge area includes estimating task schedules, determining the project schedule and project completion date. It will also include monitoring and controlling a project schedule throughout the project. It is closely aligned with Project Cost Management, in particular with the Estimate Activity Resources and the Estimate Activity Durations, since it is these along with their cost implications that must be finalized before the schedule can be developed. The processes required to ensure timely completion of the project.

While presenting the project plan to team members is best achieved in a detailed tabular list, this will not be effective when communicating to the Steering Committee and Stakeholders where graphical representations such as Gantt Charts and PERT Charts are more appropriate when communicating to those audiences.

Gantt chart is a project planning tool that graphically displays activities of a project in sequential order and plots them against time. Gantt chart is a bar chart that graphically displays a project over an established length of time by resource or task. It is a horizontal bar schedule showing activity start, duration and completion. It shows the connection between events and the calendar and provides a picture of the activity duration.

PERT Chart (Program Evaluation and Review Technique) is a chart that displays the relationships and dependencies between different activities. PERT chart is used to schedule, organize, and coordinate tasks within a project. Using time as the common denominator, PERT analyzes all events that can directly influence the success of a project in terms of time and performance; therefore, it visually outlines the critical path of project tasks.

Process flow diagram or process flowchart is a picture of the separate steps of a process in sequential order. It is a useful tool to make a process easy to understand at a glance. Using just a few words and some simple symbols, they show clearly what

happens at each stage and how this affects other decisions and actions.

6.5.3. Project Cost Management

In a similar way, this knowledge area is there to estimate the resources required, and the project budget. Resource costing is not just about people. It should also include other types of resource such as Materials, equipment, facilities, and project related services such as letting contracts. The processes required to ensure that the project is completed within the approved budget.

6.5.4. Project Quality Management

This knowledge area covers two main areas, creating the products to an acceptable quality level, and the quality of the project management process itself. The processes required to ensure that the project will satisfy the needs for which it was undertaken.

Performing Quality Assurance is the act of auditing and comparing the quality requirements against the quality control measurements to check that appropriate quality standards and operational definitions are used.

Compare and contrast this to:

Perform Quality Control. This is the monitoring the results of carrying out quality activities which will include the project deliverables/products and project management results such as how the project is performing against schedule and budget.

6.5.5. Project Human Resource Management

This knowledge area is to do with managing people. It includes aspects such as acquiring the team, developing the overall team performance, and then managing that performance such as performance appraisals, leading and coaching, and resolving resource issues and optimizing the project performance. The objective here is to ensure that all human resources are used effectively, and draws upon skills such as leadership, team building, and communication. The processes required to make the most effective use of the people involved with the project. It consists of:

Organizational planning: identifying, documenting, and assigning project roles, responsibilities, and reporting relationships.

Staff acquisition: getting the needed human resources assigned to and working on the project.

Team development: developing individual and group skills to enhance project performance.

6.5.6. Project Communications Management

Communications is not just about the human kind, but includes information such as

meeting management and actions, risk actions and assessments, project plans, reviews and walkthroughs, etc. This information must be shared with all of the project stakeholders — both internal and external to the project. The processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. Communication takes at least 90% of a Project Manager's time!

The purpose of a communications plan is to provide a framework for informing, involving, and obtaining buy-in from all participants throughout the duration of the project. The plan includes all meetings' presentations and published messages that will occur during the course of the project. The plan identifies all audiences and which method of communication will be used. Methods of communications include face-to-face meetings, reports, Web presentations, e-mail notes and project newsletters. Here are some important communication methods for a project:

The Project Team Status Meeting: This is a meeting of core project team members whose purpose is to inform the team of overall project status, communicate progress on assignments, and identify any potential problems and any new risks that may have been introduced. This meeting can also be used to determine as a team any necessary changes that need to be made to the project plan.

Project Status Reports: This is a document that is regularly published to the project sponsor, steering committee, core project team members and stakeholders to inform them of the current status of the project. Regularly publishing a status report will also assist in managing expectations for the project.

Issues Logs: All projects encounter issues. By definition an issue is anything that arises which if left unresolved could delay or have a negative impact on the success of the project. An issues log is a tool that is maintained to track and manage issues as they arise.

6.5.7. Project Risk Management

Risk management is the systematic process of identifying, analyzing, and responding to project risks. It includes maximizing the probability and consequences of positive events and minimizing the probability and consequences of adverse events to project objectives. Risk identification is best done during planning, and as many people should be involved as possible, so that the complete picture of risk threats and positive opportunities to the project can be identified.

6.5.8. Project Procurement Management

Most projects work within a customer/supplier environment. Generally the project team is working on behalf of the customer, and suppliers are responsible for the creation of the project deliverables/products — there can be both internal suppliers and external suppliers. Project Procurement is used when it is necessary to purchase or acquire products, services, or results needed from outside the project team. The processes required to acquire goods and services to attain project scope from outside

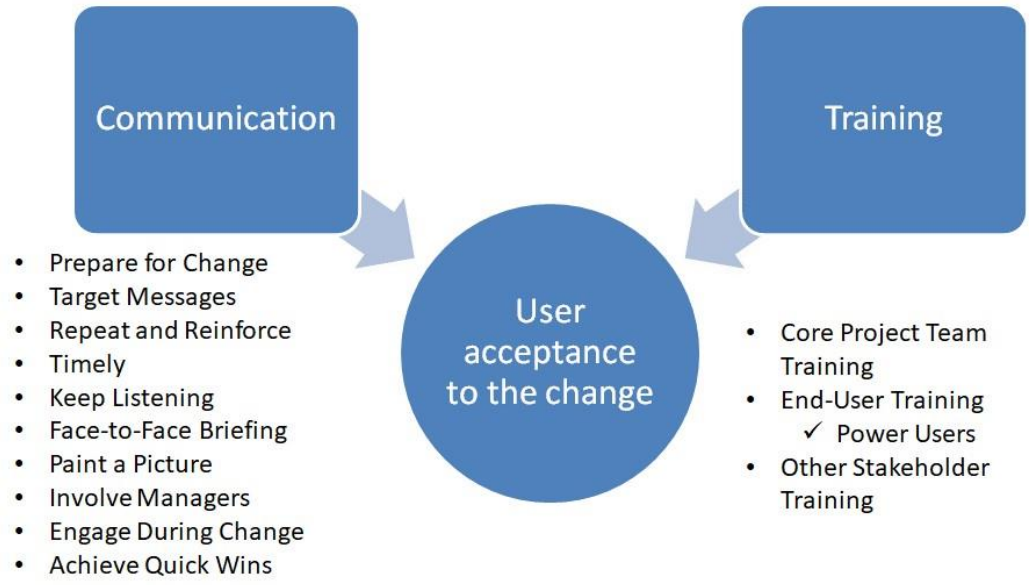
the performing organization.

6.5.9. Project Integration Management

Integration management is an element of project management that coordinates all aspects of a project. Project integration, when properly performed, ensures that all processes in a project run smoothly. Integration management will produce a series of deliverables. These deliverables include the project charter, project plan, and preliminary project scope statement. In other word, project integration is a subset of project management that includes the processes required to ensure that the various elements of the project are properly coordinated.

7. Change Management

Every systems implementation project involves a great deal of change. Not only do the business users and technical support teams need to learn a new system, they often need to learn processes as well. While the project may be improving the way in which work gets done, not all users will welcome the change. Some users will be resistant to change and, conversely, there will be those who welcome change. The challenge is to manage the expectations of both groups.



7.1. Training

Ongoing, effective training is essential in any change management initiative, particularly when new technology and work processes are involved. At the beginning of the project, a training plan should be developed. This plan should include a complete assessment of the current skills and future requirements for all who will be affected by the change.

Training people in the context of a systems implementation includes teaching them how to use a new process and a new system. Without proper training, the project team, end users and management will not be able to understand how to work in the

new way. This can jeopardize the success of the implementation through lack of adoption and the continuation of those manual processes and workarounds the system was implemented to replace.

7.1.1. Core Project Team Training

The core project team is the first group of people that need to be trained on the application. While the implementation may have experienced consultants to assist, the sooner the internal team has an understanding of how the application works the more productive each team member will be and the less reliant on consultants.

Ideally have the core project team attend training before the build phase of the project. Minimally have this team trained before the testing phases of the project. Typically they will attend training provided by the software vendor that is generic to the product. It is possible to arrange some customized training for a larger project team that has specific training needs.

7.1.2. End-User Training

The people that will be using the application on a regular basis need to be trained before the system goes live. It is best to time this as close to the go live as possible as retention of the training is compromised when one cannot immediately use what they have been taught. End users need to be taught not only on how to use the system but also on the new processes.

Ideally, create custom training for the end users. This will be tailored to reflect the business processes and configuration of the product. User training should also be limited to only those processes the specific user performs. Tailored training will increase the likelihood of adoption and acceptance of the new system and process.

Involving "power users" can be an effective training technique. Organizations may use individuals who adapt to the new technology quickly to provide one-on-one on-the-job training to those who do not learn the system as rapidly.

7.1.3. Other Stakeholder Training

There are always those persons who are not regular users of the system, but are owners of the processes the system supports or may be casual users of the application. It is important that these interested parties have training on the new system and processes, BUT NOT at the expense of the end users. While these people tend to have more clout in the organization, they are not the priority audience for training. Oftentimes these people will be satisfied with a demonstration of the new system instead of attending formal training. The key for this audience is to balance their need to know and the overall project training objectives.

One common error is providing too detailed training too early in the learning process. If training is provided too early, users will not retain the material. Additionally, advanced training should be provided in phases, as users become accustomed to

performing routine tasks. Training should also be provided in new employee orientation programs.

7.2. Communication

Effective change communication can make the difference between success and failure of an HRIS implementation project. No matter what kind of change initiative an organization's leadership may desire, the change won't be successful without the support and commitment of a majority of its managers and employees. Getting people "unstuck"—that is, getting them to not only embrace the vision but also change their beliefs and thinking to move in the new direction—is a huge communication challenge.

Communication plays a vital role in the success of change programs. It is difficult to engage everyone based only on communication alone, however. Ideally, people must participate in the process from beginning to end. If the sentiment is that the change is imposed from the top, then gaining commitment will be tough. The following 10 tips can help you communicate through times of change.

7.2.1. Prepare for Change

Constant change has almost become a norm, so challenge the status quo regularly to help employees become aware of the need for change, either now or in the future. Use staff quizzes to challenge the current situation. This is an example of a question you might include: "In our changing industry, which will be the most effective way to do business in the future? A, B or C?" To ensure high employee participation, use a quiz format that is delivered directly onto targeted employee's computer screens with display recurrence options based on the user's response.

7.2.2. Customize and Target Messages

Avoid a 'one size fits all' approach to communicating change. During organizational change it is particularly important to customize and target messages to meet the needs of the different employee groups within your organization.

7.2.3. Repeat and Reinforce

Use multiple message formats and repeat important concepts to drive and reinforce behavior change.

7.2.4. Ensure Change Communications are Timely

Fast and effective message cut-through. Use Desktop Alerts as an effective way to draw employees' attention to important or urgent messages.

7.2.5. Listen and Keep Listening

Gauge employee attitudes to change - Survey employees to gauge their attitudes

towards organizational changes and assess how well they understand them.

Keep your finger on the pulse - Survey employees regularly as a temperature check and test that your change strategies are working every step of the way. Target dedicated surveys to specific groups of staff (e.g. to check whether you are making progress with a resistant group).

Collect feedback and report on it - Include a section in the internal newsletter or a feature on the intranet called "Great feedback we're working with". Highlight how you are using staff's constructive comments to improve the business and the way you manage and communicate change.

7.2.6. Provide Face-to-Face Briefings

Encourage employees to attend face-to-face briefings, as this gives them opportunities to express their point of view. Be flexible with times and venues; it may be difficult to get everyone in a room at the same time.

Reinforce face-to-face executive communications - Encourage staff to ask questions and raise issues both before and after face-to-face briefings. This will help managers address concerns and employees to buy into changes.

Measure and manage information cascade - Measure how well your managers are communicating change with their teams. Use surveys and polls to understand how well each employee understands the main messages about the change and link the survey results back to individual managers as a measure of communications effectiveness. What gets measured usually gets focus and priority.

7.2.7. Paint a Picture of the Future

Tell Stories - Include articles in the internal newsletter or on the intranet to show how employees are modeling new values or putting in place new strategies. If possible, allow them to submit their stories directly.

Digital signage on screensavers - Pictures paint a thousand words. Use interactive screensaver messages for change communications and to portray a positive picture of where the organization and its products are headed. Broadcast them around your organization to capture employee's imagination in an appealing, visual way.

Scenario quizzes - Help employees visualize the change working for them. Ask scenario questions. For example, "The new XYZ technology will help me do A, B, C, or D or all of the above?" Offer prizes to encourage staff to take part. Include humorous or trick questions and answers to lighten the tone and make the staff quiz fun.

7.2.8. Make it Easy for Managers to Communicate Change Effectively

Provide advance notification - Ensure managers are fully briefed prior to their teams being notified of change. Allow sufficient time for them to plan their response,

including a FAQ sheet.

Regular updates via scrolling desktop ticker - Give administrator rights to Team Leads so they can create and publish news feed tickers featuring the latest, accurate (and top-down) updates.

Video updates - Create internal video updates relevant to specific employee groups. Work with managers to make messages as relevant as possible to the different groups. Use reporting options to see which employees have watched the video.

7.2.9. Focus on Employee Engagement During Change

Involve staff - Use Staff surveys to involve employees and elicit their views. Consider letting employees respond anonymously for maximum candor. Every problem uncovered is a problem that you can address.

Celebrate new beginnings - Allow employees to contribute their own articles to the internal newsletter or intranet. Encourage them to tell their own stories about how the changes are working for them.

Repeat key messages - Repeat your main messages in a range of ways to ensure that they don't become boring or are seen as 'wall paper'.

Inject fun and involve people - Use a Staff quiz to ask employees to name new ways of working (e.g. new systems, projects) or suggest improvements. Offer prizes for the best ideas and recognize them using Screensaver Messages and articles in the internal newsletter.

7.2.10. Measure Results and Celebrate Successes (Quick Wins)

Benchmark and track trends - Survey staff to assess what's working, measure attitudes, understanding and to track trends.

Highlight and celebrate success Screensaver messaging provides a visual, engaging way to highlight and celebrate success during the change. Target Screensaver Messages to specific employee groups to celebrate companywide successes as well as small local wins.

Profile success stories Use an internal newsletter as an engaging way to document success. Encourage employees to submit articles that talk about what they have achieved (e.g. simpler ways of working, important milestones met).

7.3. Resistance to Chang

Despite the fact that the new systems are being implemented to improve the efficiency and effectiveness of the HR function, fear and resistance to the new system from HR staff will be common and must be anticipated and addressed. What people resist is the loss of control over their lives that they fought so long and hard to create.

This sense of loss of control often leads to a lot of uncertainty about the future. One way to help people regain control of their work lives is effective two-way communication. People need to understand what is happening, that change is essential.

Resistance can represent critical feedback about potential problems associated with the change. For example, those who are providing the resistance may possess vital details of problems that will arise if the change is made. Those resisting the change often care passionately about the organization and this passion ignites the resistance. Change leaders may be able to work with these individuals to refine the change, harnessing their energy to redesign the portion of the plan that could have ultimately derailed the change.

When employees outside the HR department are affected by new technology, as is the case with the introduction of manager or employee self-service components, resistance to the change is also a common source of problems in an implementation. All these issues can be prevented or addressed with proactive, continuous communication and effective, ongoing training.

7.4. User Acceptance

One approach to improving the odds of convincing people that the change is necessary is to help them understand that the vision for the change is headed in the right direction. It's important that people understand both emotionally and intellectually why they need to change.

Ultimately, acceptance of the new technology and new processes represents project success. Although the technical challenges in implementing any system can be great, it is the people "challenges that cannot be overlooked (although often are) during the implementation phase" of an HRIS.

End users must be involved and feel ownership of the new system. When future users participate in the planning and acceptance testing of a new HRIS, as well as in the process of converting to a new system, their commitment to the project increases.

One of the major obstacles in gaining user acceptance is getting users to try out the new system. Offering rewards to encourage user participation in new systems can be very effective. Research clearly shows that acceptance is improved if information is clearly communicated, if users are involved in the process, and if ongoing training is provided. Not everyone will accept the changes at the same time. User acceptance can be influenced by culture and demographics.

Part Two: Information Privacy and Security

1. Information Security

Information security (infosec) is a set of strategies for managing the processes, tools and policies necessary to prevent, detect, document and counter threats to digital and non-digital information. Infosec responsibilities include establishing a set of business processes that will protect information assets regardless of how the information is formatted or whether it is in transit, is being processed or is at rest in storage.

Information privacy and security are particularly important issues for HRIS because unlike many other organizational systems, an HRIS includes a great deal of confidential data about employees, such as social security numbers, medical data, bank account data, salaries, domestic partner benefits, employment test scores, and performance evaluations. Therefore, it is critical for organizations to understand and pay close attention to what employee data is collected, stored, manipulated, used, and distributed—when, why, and by whom.

Organizations also need to carefully consider the internal and external threats to this data and develop strong information security plans and procedures to protect this data and comply with legislative mandates. There is a growing concern about the extent to which these systems permit users (both inside and outside of the organization) to access a wide array of personal information about employees As a result, employees may perceive that if these data are accessed by others, the information contained in their employment files may embarrass them or result in negative outcomes (e.g., denial of promotion or challenging job assignment).

1.1. Threat Sources

1.1.1. Human error

When an HRIS is not well designed, developed, and maintained and employees are not adequately trained, there is a high potential threat of security breaches. Research suggests that human errors, such as incorrectly entered data or accidental destruction of existing data, constitute security threats to the availability, accessibility, and integrity of information

1.1.2. Disgruntled Employees and ex-employees

One of the concerns overlooked by HR managers is that information may be damaged by disgruntled employees. This is commonly referred to as an insider threat. Employees and ex-employees are dangerous since they have extensive knowledge of systems, have the credentials needed to access sensitive parts of systems, often know how to avoid detection, and can benefit from the trust that usually is accorded to an organization's employees.

1.1.3. Other "Internal" Attackers

Many businesses hire contract workers, who work for the organization for a short period. Contract workers usually gain temporary access to various critical areas of an organization. This creates risks almost identical to those created by employees.

1.1.4. External Hackers

Another significant threat is the penetration of organizational computer systems by hackers. A hacker is defined as someone who accesses a computer or computer network unlawfully. Such attacks, often termed “intrusions”, can be particularly dangerous because, once the hacker has successfully bypassed the network security, he or she is free to damage, manipulate, or simply steal data at will.

1.1.5. Natural disasters

Typical forms of natural disasters are floods, earthquakes, fires, and lightning strikes, which destroy or disrupt computing facilities and information flow.

1.2. Types of Threats.

1.2.1. Misuse of computer systems

One of the predominant internal security threats is employees’ unauthorized access to or use of information, particularly when it is confidential and sensitive.

1.2.2. Extortion

The perpetrator tries to obtain monetary benefits or other goods by threatening to take actions that would be against the victim’s interest.

1.2.3. Theft

The value of information can be much higher than the price of hardware and software. With contemporary advances in technological developments, a relatively small computer chip (e.g., a USB device) can easily store over 100 GB of data. For example, the State of Hawaii’s HR department had medical records stolen when doctors’ offices of two doctors servicing workers compensation claims were burglarized .

1.2.4. Computer-based fraud

There is growing evidence that computer-based fraud is widespread. Over 90% of companies have been affected by computer-based fraud, such as data processing or data entry routines that are.

1.2.5. Cyber-terrorism

Cyber-terrorism is the leveraging of an information system that is intended to intimidate, cause physical, real-world harm or severe disruption of a system’s infrastructure. In one such scenario, a person with high-level computer and network skills (e.g. a hacker) is hired to break into a specific computer or computer network to steal or delete data and information Cyber-terrorists often send a threatening e-mail stating that they will release some confidential information, exploit a security leak, or launch an attack that could harm a company’s systems or networks.

1.2.6. Phishing

Victims usually receive email messages that appear to come from an authentic source with which the victim does business. The official appearance of the message and the

website often fool victims into giving out confidential information. According to Gartner the estimated cost of phishing is around $2 billion.

1.2.6. Denial-of-Service

A denial-of-service (DoS) attempts to make a service unavailable for legitimate users by flooding it with attach packets. The server that is hosting that service is then unable to handle the large number of requests, whereby shutting it down. The financial services sector has been hit particularly hard by this type of attack. For example, Bank of America and JP Morgan Chase have both experienced outages on their public websites due to DoS attacks.

1.2.7. Software Threats

A computer virus is a type of malware that works by inserting a copy of itself onto a computer or device (e.g. smart phone) and then becoming part of another program. It can attach itself to files without the user's knowledge and duplicate itself by executing infected files. When successful, a virus can alter data, erase or damage data, create a nuisance, or inflict other damage

Worms are in some ways similar to viruses since they can replicate themselves. However, unlike viruses that require the spreading of an infected file, worms such as Code Red, Slammer and MyDoom can spread by themselves without attaching to files.

Spyware is software installed on an unknowing user's computer that gathers information about the user's activities on the Web (keystrokes, web sites visited, et cetera) and transmits it to third parties such as advertisers or attackers. Problems associated with spyware include potential privacy invasion, appropriation of personal information, and interference with the user's computer operation.

Blended Threats: These threats propagate both as viruses and worms. They can also post themselves on websites for people to download unwittingly.

Trojan is another type of malware that usually hides inside email attachments or files and infects a user's computer when attachments are opened or programs are executed. Trojans are named after the Trojan-horse of Greek mythology in that they appear to be something positive, but are in reality doing something malicious. Unlike viruses and worms, Trojans do not reproduce by infecting other files nor do they self-replicate. Instead, they must be opened on a computer by a user. Some Trojans can work as spyware, while others can display a login or install screen and collect personal data such as usernames and passwords, or other forms of identification, such as bank account or credit card numbers. They can also copy files, delete files, uninstall applications using remote access programs on the computers, and format disks without alerting the victim.

1.3. Security Policies

Information security is not predominantly a technical issue; it is more of a management issue. It is easy to see why at times there is a major focus on technology. Technology is visible, and there are many things that we can say about security technologies.

This lends credence to importance of effective security policies. Security policies identify valuable assets, provide a reference to review when conflicts pertaining to security arise, outline personal responsibility, help prevent unaccounted-for-events, outline incident response responsibilities, and outline an organization's response to legal, regulatory, and standards of due care.

For effective implementation of security organizations usually follow established security standards such as ISO/IEC 27000 series. This series focuses on areas such as access control, security management, good practices, and protection of health related information. Almost all aspects of the ISO/IEC 27000 series mesh with HRIS. For example it is standard practice to require HR employees to change their passwords on a quarterly basis to achieve optimal access control. It is also a generally good practice to verify that all HRIS users are properly trained in the secure use and handling of equipment, data, and software.

1.4. Security Practices

HR application security must contain multiple levels of security. There are three (3) key terms when talking about HR Application security: authentication, application level security and data level security. Within the security levels, persons are assigned permissions as to what they can do with the data; these typically are Display/View, Create, Update or Change.

1.4.1. Authentication

Authentication is the process that identifies the person logging in as having permission to access the application. This checks that the user ID and password combination are a valid one for this application. This level of security merely works as a means for making sure that only authorized users of a system are in that system.

1.4.2. Application level

Application level security defines what information one can see in the application. This includes the modules that can be accessed, the screens and sometimes even which fields can be seen. This is typically based on a person's role as identified to the system that is attached to their system ID. For example, a Benefits Role would have access to specific plan information, where a Compensation role would not. This allows the company to secure the data within a system to specifically those users who have a need to see or use the data.

1.4.3. Data-level

Data-level security defines whose information can be seen in the application. It defines the rights to the system based on a data value. Typically this is defined by organizational unit where a person can see someone within their own organization but not within another's organization. This is the level of security that is used when one has a global organization and must restrict access to one's country. An HR representative may have full access to the information in the system (application level security) but only to those in their country (data level security).

1.4.4. Display/View

Display/View is a permission that allows a user to look only at the information for the persons in the system they are allowed to see. This does not allow them to change any information. This typically does include the right to run reports.

1.4.5. Create

Create is a permission that allows a user to create a new record. In the case of an HRIS, it would be the ability to process a new employee. Care must be taken in setting up the application and data-level security for those who can create a record. It must take into account all of the parts of the system required to create a record, as well as the data values. For example, if the person entering the information cannot access the record of an employee in division A, they will not be able to create a record for someone in that division either.

1.4.6. Update

Update refers to the ability to create a new row of data in an existing record. This allows the user to update the employee record with new information while creating a history record with the old information. In this manner, the old information is retained for reporting or audit purposes.

1.4.7. Change

Change refers to the over-writing of information that already exists without creating a new row of data. This can also be referred to as "correction" access. This will not create a record for reporting or audit purposes unless the application has database level processes in place, to keep a record of the "old" information and thus should only be given to those few persons who need to make corrections to the data.

1.4.8. Delete

Delete refers to the ability to remove a row of data permanently. Use of this should be very limited because when data is permanently deleted it is no longer available in the database. The authority to perform this activity is usually limited to very few users, and approvals are required so that the valid records are not accidentally deleted.

1.5. Security and Self-Service Processes

When self-service processes are used in HR applications additional security considerations need to be taken.

1.5.1. Employee self-service

Data-level security must be able to allow the employee access only to their own record but flexible enough to know that if this employee is also a manager or an HR representative they may also have access to other records in the application.

1.5.2. Manager Self-Service

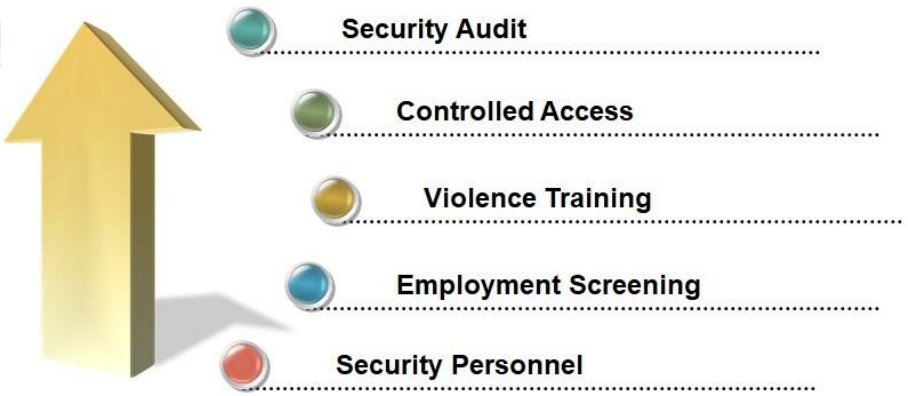
Data-level security must be able to allow managers access to all employees that report to them. Depending on work structure, these employees may or may not be in the same organizational unit of the manager. This must also take into account how a record will be updated in the event that the manager is not available. Workflow

processes that instruct systems what steps a change must take before it is approved to be written to the system must be able to identify alternate approvers of the transaction. This is particularly true of those changes that are time-sensitive.

2. Security Management

Workplace security involves the physical and procedural measures used to protect people, property, and information. The goal of workplace security is to reduce or eliminate the risks of loss of an organization's assets-both tangible and intangible-from causes and events not within the normal boundaries of conventional profit/loss activities.

A comprehensive approach to security management is needed to address a wide range of issues, including workplace violence. HR managers may have responsibility for security programs or may work closely with security managers or consultants. Security programs can also include a proprietary or contracted security force. Whichever type of security force is used, employees need to assist them in security efforts.



2.1. Security Audit

In a security audit, HR staffs conduct a comprehensive review of organizational security. Sometimes called a vulnerability analysis, such an audit uses managers inside the organization (e.g., the HR manager and the facilities manager) and outsiders (e.g., security consultants, police officers, fire officials, and computer security experts) to assess security issues.

Typically, a security audit begins with a survey of the area around the facility. Such factors as lighting in parking lots, traffic flow, location of emergency response services, crime in the surrounding neighborhood, and the layout of the buildings and grounds are evaluated. The audit also may include a review of the security available within the firm, including the capabilities of guards. Another part of the security audit reviews disaster plans, which address how to deal with events such as earthquakes, floods, tornadoes, hurricanes, and fires.

2.2. Controlled Access

A key part of security involves controlling access to the physical facilities of the

organization. Many workplace homicides occur during robberies. Therefore, employees who are most vulnerable, such as taxi drivers and convenience store clerks, can be provided bulletproof partitions and restricted access areas.

Many organizations limit access to facilities and work areas by using electronic access or keycard systems. Although not foolproof, these systems can make it more difficult for an unauthorized person, such as an estranged spouse or a disgruntled ex-employee, to enter the premises. Access controls also can be used in elevators and stairwells to prevent unauthorized persons from entering designated areas within a facility.

Controlling computer access may be an important part of securing IT resources. Coordination with information technology resources to change passwords, access codes, and otherwise protect company information may be important.

2.3. Violence Training

Managers, HR staff members, supervisors, and employees should be trained on how to recognize the signs of a potentially violent employee and what to do when violence occurs. During training at many firms, participants learn the typical profile of potentially violent employees and are trained to notify the HR department and to refer employees to outside counseling professionals. Such training requires observers to notice verbal and nonverbal reactions by individuals that may indicate anger or hostility, and to listen to individuals exhibiting such reactions.

2.4. Employment Screening

A key facet of providing security is screening job applicants. HR management is somewhat limited by legal constraints on what can be done, particularly regarding the use of psychological tests and checking of references. However, firms that do not screen employees adequately may be subject to liability if an employee commits crimes later. For instance, an individual with a criminal record for assault was hired by a firm to maintain sound equipment in clients' homes. The employee used a passkey to enter a home and assaulted the owner; consequently, the employer was ruled liable for not doing an adequate background check. Of course, when selecting employees, employers must be careful to use only valid, job-related screening means and to avoid violating local labor laws.

2.5. Security Personnel

Providing adequately trained security personnel in sufficient numbers is a critical part of security management. Many employers contract for these personnel with firms specializing in security. If security is handled in-house, security personnel must be selected and trained to handle a variety of workplace security problems, ranging from dealing with violent behavior by an employee to taking charge in natural disasters.

3. Information Privacy

Information privacy has been defined as the "degree to which individuals have control over the collection, storage, access, and release of personal data".

3.1. Unauthorized access to information

One reason that employees are concerned about the storage of data in an HRIS is that they fear that these systems may allow unauthorized access to their private information. For example, employees may perceive that if users have access to their social security numbers or bank data they will experience identity theft. In fact, some reports indicate that identity theft is the primary consequence of the breach of HRIS data (Privacy Rights Clearinghouse, 2010). Similarly, if unauthorized users have access to medical data or domestic partner benefits then employees feel that they will experience embarrassment or loss of job opportunities (e.g., promotions, pay raises, challenging job assignments).

Some research also indicated that employees were more likely to perceive an HRIS as invasive of privacy when they were unable to control access to their personal data, and information was accessed by users outside the organization than those inside the organization.

Results of other research revealed that the use of an HRIS was perceived as invasive of privacy when (a) supervisors were able to access information in employee records, (b) the same data were used for employment rather than HR planning, and (c) the employees did not have the ability to check the accuracy of the data before decisions were made.

3.2. Unauthorized Disclosure of Information

Another concern about the use of HRIS is that employees may perceive that these systems allow for the unauthorized disclosure of information about them to others. For example, research revealed that 70 percent of employers regularly disclose employment data to creditors, 47 percent give information to landlords, and 19 percent disclose employee data to charitable organizations.

In addition, some reports indicated that organizations regularly sell data collected on recruiting websites. Furthermore, 60 percent of employers do not inform applicants or employees when they disclose information within or outside the organization.

3.3. Data accuracy problems

Employees are also troubled about data accuracy because HRIS may contain inaccurate or outdated information about them. Not surprisingly, individuals are often unaware that data in these systems are inaccurate, and many organizations do not give them the opportunity to review or correct data stored in HRIS.

3.4. Stigmatization problems

Employee are often uneasy about the use of HRIS especially when they feel that networked data may lead to them to be stigmatized or deeply discredited in the employment

3.5. Use of Data in Social Network Websites

Recently, organizations have started collecting and using data about applicants and employees from social network websites (SNS) (e.g. Facebook, LinkedIn, and Twitter).

For instance, organizations now use SNS to collect information about job applicants' lifestyle, family background, friends, sexual orientation, religion, political affiliation, and personal interests. Estimates indicate that between 20 and 40 percent of employers now scan SNWS to gather data about job applicants and 75 percent of recruiters are currently required to do online research on applicants before making hiring decisions

3.6. Privacy Policies

Despite the widespread use of HRIS and growing concerns about the (a) unauthorized access, (b) unauthorized release, (c) data accuracy and (d) use of data to stigmatize employees, many companies have not established fair information management policies to control the use and release of employee information.

There are two (2) major pieces of legislation that need to be complied with in the area of data privacy, the European Union (EU) Data Protection Directive and the U.S. Department of Commerce Safe Harbor act. Their general tenants will be tested in GPHR exam (not in PHRi or SPHRi exam). For specifics on the legislation and how they impact the organization, consultation with legal counsel is advised. There will be other data privacy requirements in other parts of the world as legislation continues to evolve. Having a knowledgeable attorney in each country the company operates is advised.

3.7. Privacy Practices

Several best practices have been proposed to ensure that employee data is secured and employee privacy is protected. These include:

- Adopt a comprehensive information security and privacy policy.
- Store sensitive personal data in secure HRIS and provide appropriate encryption.
- Dispose of documents properly or restore persistent storage equipment.
- Build document destruction capabilities into the office infrastructure.
- Implement and continuously update technical (firewalls, anti-virus, anti-spyware etc.) and non-technical (security education, training, and awareness) measures.
- Conduct privacy "walk-throughs," and make spot checks on proper information handling.

4. Privacy Management

Workplace privacy issues swirl around the controversy of how closely an employer can monitor its employees. Some companies have invested considerable time in creating privacy guidelines meant to explain exactly what is and is not allowed in terms of monitoring, but these guidelines are almost never legally binding. In some cases they may even be used to create a false sense of security among employees. Most experts suggest avoiding the whole messy business of workplace privacy by never using company computers or cell phones for anything other than company business, but various complications can still ensue, resulting in legal consequences.

The extensive growth of technology use by employers and employees is constantly creating new issues to be addressed. Such technology usages as twitters, wikis, social networking, and blogs require attention by employers.

4.1. Monitoring Electronic Communications

Employers have a right to monitor what is said and transmitted through their Internet and voicemail systems, despite employees' concerns about free speech. Advances in information and telecommunications technology have become a major employer issue regarding employee and workplace privacy. For example, the use of e-mail increases every day, along with employers' liabilities if they improperly monitor or inspect employees' electronic communications. Many employers have specialized software that can retrieve deleted electronic communications e-mail, and some even record each keystroke made on their computers.

There are recommended actions for employers to take when monitoring technology. Employers should monitor only for business purposes and strictly enforce the policy. For instance, one problem is that most people express themselves more casually in e-mail than they would in formal memos. This tendency can lead to sloppy, racist, sexist, or otherwise defamatory messages.

Court cases have been brought over jokes forwarded through e-mails that contained profanity or racist undertones. Another problem is that electronic messages can be sent rapidly to multiple (and sometimes unintended) recipients. Also, the messages can be stored, and often legal cases hinge on retrieval of the messages.

4.2. HR Policies on Electronic Communications

Given all the time and effort employees spend on technology through both work and personal actions, it is important for HR professionals to provide guidance to executives, managers, and employees. Some areas in which HR policies need to be made can include the following:

- Establishing security and voicemail system
- Communicating that the employer will attempt to monitor security, but it may not be totally guaranteed
- Restricting the use of employee records to a few individuals

Communicating policies on electronic communications to employees, enforcing them by monitoring employee Internet use, and disciplining offenders are means used by employers to ensure that the Internet is used appropriately. These efforts are necessary because both supervisors and employees can engage in violating electronic monitoring policies and practices.

Employers' efforts also can attempt to guard against some employees' accessing pornographic or other websites that could create problems for the employer. If law enforcement investigations find evidence of such access, the employer could be accused of aiding and abetting illegal behavior. Many employers have purchased software that tracks the websites accessed by employees, and some employers use

software programs to block certain websites that are inappropriate for business use.

4.3. Balance Employee Security and Privacy

Balancing employer and employee privacy is becoming more difficult. On one side, employers have a legitimate need to ensure that employees are performing their jobs properly in a secure environment. On the other side, employees expect the rights that they have both at work and away from work to be protected. The commonplace monitoring of e-mail and voicemail is only one way employers watch the workplace. Technology gives employees who leave an employer the opportunity to take a great deal of valuable company secrets or data with them. For this reason (and others as well), workplace monitoring has increased.

4.3.1. Conducting Work-Related Investigations

Workplace investigations are frequently conducted using technology. Such means allow employers to review e-mails, access computer logs, conduct video surveillance, and use other investigative tactics. When using audiotaping, wiretapping, and other electronic methods, care should be taken to avoid violating privacy and legal regulations.

4.3.2. Employee Theft

Employee Theft problem faced by employers is employee theft of property and vital company secrets. White-collar theft through embezzlement, accepting bribes, and stealing company property also is a concern. If the organizational culture encourages or allows questionable behavior, then employees are more likely to see theft as acceptable. Employee theft and other workplace misconduct can be addressed using a number of methods. Typical methods may include doing an investigation before hiring, using applicant screening, and conducting background investigations. After hire, workplace monitoring can review unusual behaviors, such as those mentioned earlier.

4.3.3. Honesty and Polygraph Tests

After hire, workplace monitoring can review unusual behaviors, such as those mentioned earlier. Honesty and polygraph tests may be used both before and after a person is hired. Pencil-and-paper honesty tests or integrity tests are widely used, particularly in the retail industry and others. For current employees, polygraph testing (performed with lie detectors) is used by some organizations. However, many governments prohibit the use of polygraphs for most pre-employment screening and also requires that employees must:

- Be advised of their rights to refuse to take a polygraph exam.
- Be allowed to stop the exam at any time.
- Not be terminated because they refuse to take a polygraph test or solely because of the exam results

4.3.4. Employee substance abuse and drug testing

Employee substance abuse and drug testing have received a great deal of attention. Concern about substance abuse at work is appropriate, given that absenteeism, accident/damage rates, and theft/fraud are higher for workers using illegal substances or misusing legal substances such as drugs and alcohol.

When employers conduct drug testing of current employees, they generally use one of three policies: (1) random testing of everyone at periodic intervals, (2) testing only in cases of probable cause, or (3) testing after accidents. Means of testing include urinalysis and hair testing, among others.

If testing is done for probable cause, it needs to be based on performance related behaviors, such as excessive absenteeism or reduced productivity, and not just the substance usage itself.

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