Information handling skills

20

Key concepts and terms

- *Average*
- *Causality*
- *Chi-squared test*
- *Correlation*
- *Dispersion*
- *e-HRM*
- *Enterprise resource planning (ERP) system*
- *Frequency*
- *Frequency distribution*
- *Functionality*
- *HR information system*
- *HR portal*
- *Human capital management*
- *Intranet*
- *Line of best fit*
- *Lower quartile*
- *Mean*
- *Median*
- *Mode*
- *Multi-regression analysis*
- *Multivariate analysis*
- *Regression*
- *Reverse causation*
- *Scattergram*
- *Self-service*
- *Significance*
- *Standard deviation*
- *Statistics*
- *Trend line*
- *Upper quartile*
- *Vanilla system*
- *Variance*

LEARNING OUTCOMES

On completing this chapter you should be able to define these key concepts. You should also know about:

- The meaning and purpose of information
- How to handle information
- Reasons for using an HRIS
- Functions of an HRIS
- Features of an HRIS
- Introducing an HRIS
- The use of statistics
- Frequency analysis
- Measures of central tendency
- Measures of dispersion
- Correlation
- Regression
- Tests of significance
- Tests of hypotheses

Introduction

Information, as Drucker (1988: 46) observed, is 'data endowed with meaning and purpose'. The significance of evidence-based management, as discussed in the last chapter, is that it is based on information. Human capital management as a major HR activity is the process of informing HRM decisions by obtaining, analysing and reporting on data and information relating to employees. Evaluation of the effectiveness of learning and development and other HR activities is only possible by reference to relevant data.

HR specialists must therefore possess the knowledge required to commission and manage computerized systems to provide them and line managers with information covering such matters as employee records, absenteeism, employee turnover, rates of pay and employee benefits. Such systems also help with the administration of HR activities such as recruitment, performance management and reward. In addition, HR people need skills in using statistics to record and present information.

This chapter starts with a review of information handling skills in general, continues with an examination of the use of HR information systems (e-HRM) and is completed with an outline of the main statistical methods that can be used in HRM.

Handling information

To handle information it is necessary to:

- decide what information is required for decision making and management purposes;
- identify the relevant data that is readily available and where and how it can be obtained;
- identify where any data at present unavailable can be obtained and decide whether the value of the data justifies the effort and cost of getting it;
- take steps to convert the raw data that has been made available into information which has 'meaning and purpose' in accordance with specified requirements;
- establish how best to record, analyse and present the information in ways which ensure that it serves a useful purpose.

These actions inform the development of a computerized system for providing information as well as carrying out various administrative tasks as described below. They also provide guidance on the statistical methods which can be used to analyse and present the information.

HR information systems

An HR information system (HRIS) is a computer-based information system for managing the administration of HR processes and procedures and for providing HRM data. The process is sometimes called 'e-HRM'.

HRIS functions

A list of possible HRIS functions (its 'functionality') is given below. The functions cover almost every aspect of HRM.

- HR surveys and audits
  - Conducting opinion and engagement surveys
  - Conducting employee entrance and exit surveys
  - Measuring diversity issues
  - Knowledge management
  - Producing HRM metrics
- HR administration
  - Employee record maintenance
  - Self-service systems – enabling managers and employees to inspect and update records
  - Absence management – recording, analysing and distributing data

  - Equal opportunity modelling
  - Employee communications via an intranet
  - Expenses
  - Working time analysis (overtime, shifts, etc)
- HR planning
  - Preparing and monitoring workforce plans
  - Forecasting staffing levels
  - Generating organizational charts
  - Tracking labour costs
  - Preparing and monitoring succession plans
- Resourcing
  - Submitting job requisition information
  - Requisition processing
  - Handling internal referrals
  - Posting job vacancies within the organization
  - Online recruitment
  - Processing job applications
  - Storing CVs
  - Tracking applicants through the recruitment process
  - Pre-screening job applicants
  - Testing candidates
  - Recording outcome of interviews
  - Processing correspondence with applicants
- Performance management
  - Online performance management systems
  - Providing and analysing 360-degree feedback data
  - Producing performance management documentation
  - Recording employee appraisals and 360-degree feedback
- Learning and development
  - Assessing training needs
  - Preparing and updating skills inventories
  - Handling training requests
  - Scheduling training sessions
  - Developing instructional material
  - Delivering course material to diverse locations
  - E-learning – preparation and presentation of learning material
  - Recording employee training
  - Recording and analysing training costs
  - Evaluating training effectiveness
- Reward management and administration
  - Conducting job evaluations
  - Conducting pay surveys
  - Modelling pay structures
  - Administering incentive pay schemes

  - Modelling pay reviews and costs
  - Conducting equal pay audits
  - Maintaining payroll data
  - Transferring employee data between HR and outside payroll systems
  - Allowing managers and employees to access pay data information
  - Total reward statements
- Employee benefits
  - Creating access to an employee handbook
  - Providing employees with retirement planning information
  - Giving employees access to their own benefit information
  - Providing answers to employee benefits questions
  - Providing information on flexible benefits scheme
  - Assisting employees in their benefits selection
  - Enrolling employees in benefit plans
  - Letting employees make changes to their own benefits records
- Health and safety
  - Analysing workplace incidents
  - Capturing statistical information on each incident
  - Reporting incidents
  - Health and safety prevention planning
- Employee well-being
  - Online service delivery of employee assistance programmes

The 2007 CIPD survey found that the 10 most popular uses to which respondents put their HRIS were:

- absence management;
- training and development;
- rewards;
- managing diversity;
- recruitment and selection;
- other (usually payroll);
- appraisal/performance management;
- HR planning;
- knowledge management;
- expenses.

Reasons for introducing an HRIS

The top 10 reasons for introducing an HRIS, established by the CIPD in 2007, were:

1. to improve quality of information available;
2. to reduce administrative burden on the HR department;

3 to improve speed at which information is available;
4 to improve flexibility of information to support business planning;
5 to improve services to employees;
6 to produce HR metrics;
7 to aid human capital reporting;
8 to improve productivity;
9 to reduce operational costs;
10 to manage people's working time more effectively.

Features of an HRIS

The features of particular interest in an HRIS system are the use of software, integration with other IT systems in the organization, use of the intranet and provisions for self-service.

Use of software

It is customary to buy software from an external supplier. There is a choice between buying a 'vanilla system' (ie an 'off-the-shelf' system without any upgrades) and customizing the supplier's system to meet specified business requirements. Extensive customization can make future upgrades problematic and expensive, so it is important to limit it to what is absolutely necessary.

If an external supplier is used, the choice should be made as follows:

- Research HR software market through trade exhibitions and publications.
- Review HR processes and existing systems.
- Produce a specification of system requirements.
- Send an invitation to tender to several suppliers.
- Invite suppliers to demonstrate their products.
- Obtain references from existing customers, including site visits.
- Analyse and score the product against the specification.

Integration

Enterprise resource planning (ERP) systems integrate all the data and processes of an organization into a unified system with the same database. HR systems are not frequently integrated to this extent although they often link payroll administration with other HR functions. Integration of the HR system with IT systems in the wider organization so that they can 'talk to one another' will aid human capital reporting, comply with supply-chain partner requirements, improve profitability, reduce headcount and deliver against economic criteria. However, many HR departments retain stand-alone systems because they believe that integration would compromise their

own system and that there was potential lack of confidentiality. They may also be concerned with the costs and perceived risks involved.

Intranet

An intranet system is one where computer terminals are linked so that they can share information within an organization or within part of an organization. The scope of the information that can be shared across terminals can be limited to preserve confidentiality and this security can be enhanced by using passwords. HR intranet systems can be used for purposes such as updating personal details, applications for internal jobs online, requests for training, access to e-learning, administration of queries and communications.

Self-service

A human resource self-service system (HRSS) allows managers and employees access to information and the facility to interact with the system to input and obtain information. Access and the range of information covered are tightly controlled. This can operate through an HR portal (a site that functions as a point of access to information on the intranet) which may be specially designed to produce a brand image of the HR function. This is sometimes referred to as a business-to-employees (B2E) portal.

For managers, self-service means that they can access information immediately. This might be HR metrics (human capital reporting measures) in such areas as absenteeism, personal details, performance management data, learning and development progress, and pay (as a basis for pay reviews). They can also input data on their staff. This facilitates the devolution of responsibility to line managers and reduces the administrative burden on HR.

Employees can also access information, input data about themselves, request training and apply for jobs online.

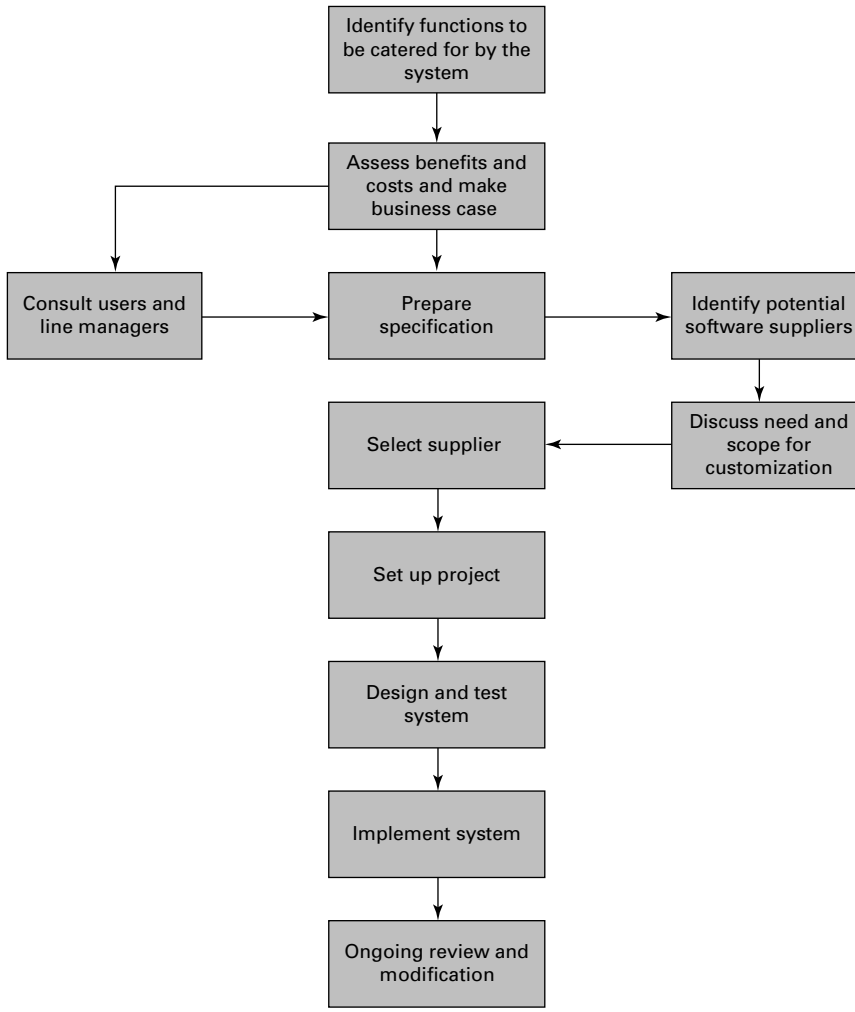
Introducing an HRIS

The steps required are illustrated in Figure 20.1.

The following are six tips on introducing an HRIS:

- Make sure you really know what you need now, and what you are likely to need in the near future so you can give clear guidelines to the software provider.
- Involve end users and other stakeholders in the decision-making process.
- Include a member of staff with IT expertise on the decision-making team, even if they're not an HR professional.
- Go for something clear and straightforward that adds value. Don't go for all the 'bells and whistles'; they may cost more, take more time to administer and you will probably end up not using them anyway.

FIGURE 20.1 Introducing an HRIS



- Evaluate the range of systems on offer in terms of how they report and how easy and quick it is to produce the types of report you need on a regular basis. Look at how reports are presented; can you download them into an Excel spreadsheet so that you can manipulate the data yourself? How easy is it to do mail merge with the information reported?
- When buying an off-the-shelf system, don't customise it unless it's critical. Each time the system is upgraded, it's these modifications that may cause you difficulties. If you do have modifications, budget for these to be managed on an ongoing basis.

Using statistics

Statistics describe and summarize data relating to a 'population', ie a homogeneous set of items with variable individual values. This involves measuring frequencies, central tendencies and dispersion. Statistics can also measure the relationships between variables (correlation and regression), establish the relation between cause and effect (causality), assess the degree of confidence that can be attached to conclusions (tests of significance) and test hypotheses (the chi-squared test and null-hypothesis testing). A wide variety of software is available to conduct the more sophisticated analyses.

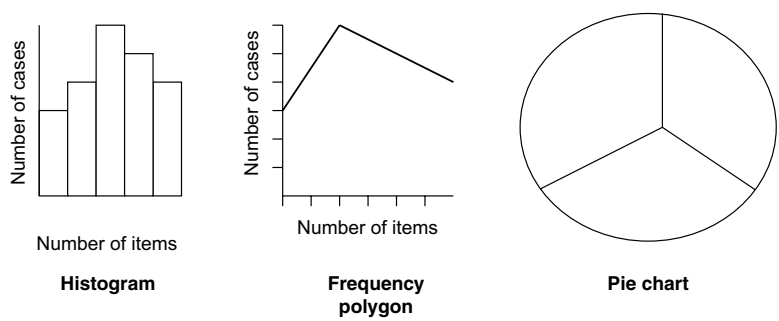
Statistics are used extensively in human resource management to analyse and present quantitative information in order to guide decisions and monitor outcomes. They are an essential element in human capital management and are also important in such fields as performance management (the analysis of appraisal results and levels of performance) and reward management (the analysis of market rates, pay reviews, the distribution of pay and equal pay). Statistics play a major part in the analysis of surveys and research evidence.

HR professionals seldom have to use advanced statistics unless they are conducting or taking part in detailed research projects. The main statistics they will use regularly are concerned with the analysis of the incidence of events or activities (frequencies), the use of averages (measures of central tendency), how items in a population are distributed (dispersion) and the relationship between two variables (regression). But they should also be familiar with the concepts of correlation, causation and at least understand the meaning of more advanced statistical techniques used by researchers such as the tests of significance, the chi-squared test and null-hypothesis testing.

Frequency

Frequency is the number of times individual items in a population or set occur. It is represented in frequency distributions expressed in tabular form or graphically. Commonly used graphs are illustrated in Figure 20.2.

FIGURE 20.2 Examples of charts



Measures of central tendency

Measures of central tendency identify the middle or centre of a set of data. There are three types:

- Arithmetic average or mean – the total of items or scores in a set divided by the number of individual items in the set. It may give a distorted picture because of large items at either end of the scale.
- Median – the middle item in a range of items (often used in pay surveys when the arithmetic mean is likely to be distorted).
- Mode – the most commonly occurring item in a set of data.

Measures of dispersion

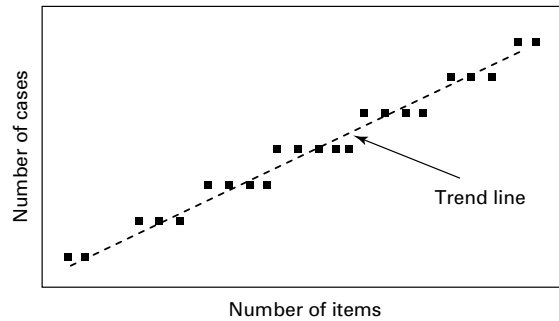
It is often useful to measure the extent to which the items in a set are dispersed or spread over a range of data. This can be done in five ways:

- By identifying the upper quartile or lower quartile of a range of data. The strict definition of an upper quartile is that it is the value which 25 per cent of the values in the distribution exceed, and the lower quartile is the value below which 25 per cent of the values in a distribution occur. More loosely, especially when looking at pay distributions, the upper and lower quartiles are treated as ranges rather than points in a scale and represent the top and the bottom 25 per cent of the distribution respectively.
- By presenting the total range of values from top to bottom, which may be misleading if there are exceptional items at either end.
- By calculating the inter-quartile range, which is the range between the value of the upper quartile and that of the lower quartile. This can present more revealing information on the distribution than the total range.
- By calculating the standard deviation which is used to indicate the extent to which the items or values in a distribution are grouped together or dispersed in a normal distribution, ie one which is reasonably symmetrical around its average. As a rule of thumb, two-thirds of the distribution will be less than one standard deviation from the mean, 95 per cent of the distribution will be less than two standard deviations from the mean, and less than one per cent of the distribution is more than three standard deviations from the mean.
- By calculating variance, which is the square of a standard deviation.

Correlation

Correlation represents the relationship between two variables. If they are highly correlated they are strongly connected to one another and vice versa. In statistics, correlation is measured by the coefficient of correlation, which varies between –1 and +1 to indicate totally negative and totally positive

FIGURE 20.3 A scattergram with regression (trend) line



correlations respectively. A correlation of zero means that there is no relationship between the variables. Establishing the extent to which variables are correlated is an important feature of HRM research, for example assessing the degree to which a performance management system improves organizational performance. But correlations do not indicate causal relationships. They can only show that X is associated with Y but this does not mean necessarily that X causes Y. Multiple correlation looks at the relationship between more than two variables.

Regression

Regression is another way of looking at the relationship between variables. It expresses how changes in levels of one item relate to changes in levels of another. A regression line (a trend line or line of best fit) can be traced on a scattergram expressing values of one variable on one axis and values of the other variable on another axis, as shown in Figure 20.3.

A trend line like this can be drawn by hand as a line of best fit but it can be calculated mathematically with greater accuracy. The distances of points from the trend line (the residuals) can be calculated as a check on the reliability of the line.

Multiple regression analysis can be conducted with the aid of a computer to express how changes in the levels of a number of items relate to changes in levels of other items.

Causality

Causality is the representation of cause and effect, ie the link between independent and dependent variables. To establish causality is to explain how one thing leads to another. Causality is a major issue in research, especially in the HRM field. It may be relatively easy to establish correlations in the shape of a demonstration that X is associated with Y; it is much more difficult and sometimes impossible to prove that X causes Y. There are a number of reasons for this, of which the two set out below are the most important.

First, complications arise because of the phenomenon of multiple causation. There may be a number of factors contributing to a result. Researchers pursuing the holy grail of trying to establish what HRM contributes to firm performance are usually confronted with a number of reasons why a firm has done well in addition to adopting 'best practice' HRM, whatever that is. Statistical methods can be used to 'control' some variables, ie eliminate them from the analysis, but it is difficult, if not impossible, to ensure that HRM practices have been completely isolated and that their direct impact on firm performance has been measured. Multivariate analysis is used where there is more than one dependent variable and where the dependent variables cannot be combined.

Secondly, there is the phenomenon of reverse causation, when a cause may be predated by an effect – A might have caused B but alternatively, B may have come first and be responsible for A. For example, it is possible to demonstrate that firms with effective performance management schemes do better than those without. But it might equally be the case that it is high-performing firms that introduce effective performance management. It can be hard to be certain.

Tests of significance

Significance as a statistical concept refers to the degree to which an event could have occurred by chance. At the heart of statistical science lies a simple idea, which is that the chance or probability of various patterns of events can be predicted. When a particular pattern is observed it is possible to work out what the chances of its occurrence may be, given our existing state of knowledge or by making certain assumptions. If something has been observed which is unlikely to have occurred by chance, this occurrence can be accepted as significant. The problem is that any attempt to reach general conclusions may have to rely on fragmentary data. It is usually necessary to rely on samples of the population being studied, and all sampling is subject to experimental error – the result can only be expressed in terms of probability, and confidence limits will have to be placed on it. These can be calculated in terms of the standard error that might be expected from a sample. A standard error is the estimated standard deviation of a sample mean from a true mean. This implies that on approximately 95 per cent of occasions the estimate of the mean provided by the sample will be within two standard errors of the true mean.

Testing hypotheses

The chi-squared test uses a statistical formula to assess the degree of agreement between the data actually obtained and that expected under a particular hypothesis.

A null hypothesis is a method of testing a hypothesis, frequently used by researchers, in which it is assumed that there is no relationship between two or more variables. It asks the question: 'Could the hypothetical relationship have

been caused by chance?' If the answer is no, then the hypothesis is worth pursuing. However, it does not prove that the hypothesis is correct; it only indicates that something is worth pursuing. It can be associated with the chi-squared test.

KEY LEARNING POINTS

The need

HR specialists must possess the knowledge required to set up and manage computerized systems to provide them and line managers with information covering such matters as employee records, absenteeism, employee turnover, rates of pay and employee benefits. Such systems also help with the administration of HR activities such as recruitment, performance management and reward. In addition, HR people need skills in using statistics to record and present information.

Handling information

To handle information it is necessary to:

- decide what is required ;
- identify the relevant data that is available or can be made available;
- take steps to convert the raw data that has been made available into information which has 'meaning and purpose';
- establish how best to record, analyse and present the information.

HRIS defined

An HRIS is a computer-based information system for managing the administration of HR processes and procedures and for providing HRM data. The process is sometimes called 'e-HRM'.

Reasons for using an HRIS

Top five reasons are:

- to improve quality of information available.
- to reduce administrative burden on the HR department.
- to improve speed at which information is available.
- to improve flexibility of information to support business planning.
- to improve services to employees.

Functions of an HRIS

Top five uses of an HRIS:

- absence management;
- training and development;

- rewards;
- managing diversity;
- recruitment and selection.

Features of an HRIS

The features of particular interest in an HRIS system are the use of software, integration with other IT systems in the organization, use of the intranet and provisions for self-service.

Introducing an HRIS

See Figure 20.1.

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They are also used to measure the relationships between variables (correlation and regression), to establish the relation between cause and effect (causality), to assess the degree of confidence that can be attached to conclusions (tests of significance) and to test hypotheses (the chi-squared test and null-hypothesis testing).

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Causality

Determining the link between independent and dependent variables (cause and effect) is a major issue in research, especially in the HRM field. It may be relatively easy to establish correlations in the shape of a demonstration that X is associated with Y; it is much more difficult and sometimes impossible to prove that X causes Y.

Tests of significance

Significance as a statistical concept refers to the degree to which an event could have occurred by chance.

References

Chartered Institute of Personnel and Development (2007) *HR and Technology: Impact and advantages*, London, CIPD

Drucker, P (1988) The coming of the new organization, *Harvard Business Review*, January–February, pp 45–53

Questions

1. What is the meaning of information?
2. What are the main reasons for having a comprehensive human resource information system?
3. What are the five most popular applications of an HRIS?
4. What is an enterprise resource planning (ERP) system?
5. What is an intranet?
6. What is self-service and why is it important?
7. What are the main considerations to be taken into account in developing an HRIS?
8. How are statistics used?
9. What use of statistics is made by HR specialists?
10. What is frequency in statistics?
11. What are the three measures of central tendency?
12. What is dispersion and how is it measured?
13. What is correlation?
14. What is regression?
15. What is causality?
16. What are the problems of establishing causation?
17. What is a test of significance?
18. How can hypotheses be tested?