The use of human resource information systems: a survey

Kirstie S. Ball

Birmingham Business School, University of Birmingham, Birmingham, UK

Abstract *Presents the results of a survey of the use of human resource information systems (HRIS) in smaller organizations, conducted in 1998. The survey enquires as to the nature of information stored electronically in three core areas: personnel, training and recruitment as well as the type of information analysis being undertaken. Significant relationships were found between the total number of people employed by the organization, and certain aspects of its information storage and manipulation. Smaller organizations were also found to be less likely to use HRIS, and HRIS was also used less frequently in training and recruitment. No sectoral differences were found. Similar to the results of IES/IPD surveys, and some academic work, it was found that HRIS are still being used to administrative ends rather than analytical ones.*

Introduction

Client server architecture, intranets, workflow and integrated GroupWare are but a few of the IT terms which ricochet around the workshops, exhibitions and practices of the HR profession and professionals in the UK. But are the new breed of human resource information systems (HRISs), with seemingly endless possibilities and flexibilities, ever to be used beyond their capacity as "automated filing cabinets" (Robinson, 1997)? Within the last decade, the explosion in information systems related literature confirms that information technology, its implementation, use and "impact" is a very well researched area in organization studies. However, personnel/human resource management (HRM), and the types of technology its practitioners employ has largely been neglected in these literatures both in terms of theory and evidence. A small amount of case study and survey work exists (Kinnie and Arthurs, 1996; Kossek *et al.*, 1994; Broderick and Boudreau, 1992; Torrington and Hall, 1989; Hall and Torrington, 1986; Legge, 1989; Martinsons, 1994, 1996), some of which has been theorised (Torrington and Hall, 1989; Martinsons, 1994). Similarly, the profession has been generating its own survey data since 1982 in what were the joint IMS/IPM "computers in personnel" surveys, and are now the IES (Institute for Employment Studies/ Institute for Personnel and Development (IES/IPD) surveys. In addition there is a surplus of articles from more popular personnel/HR publications containing "checklists" of how to implement and run HRISs as well as anecdotal accounts of best practice and individual organizational "successes".

One aspect of all of the academic studies published in the HRIS area to date is that their data collection occurred no later than 1992. Since then with the rise

of Windows, the normalization of PC based office work (Kinnie and Arthurs (1996) were still discussing the difference between mainframes and PCs), client server architecture and the affordable HRIS, the HRIS market has grown significantly across the spectrum of organizational types. The small business sector is seen as a growth area by some HRIS software vendors who proffer flexible, low-cost, generic, Windows-based products. Recent practitioner literature examining the use of HRIS in small companies advanced the view that the issues they face regarding HRIS use are slightly different to their larger counterparts, yet research in HRIS to date is oriented to the larger organization.

The aims of this paper are first to review the issues surrounding the use of HRISs by personnel and human resources departments, and second to present empirical data which profile system usage by 115 of these UK companies in the service sector in terms of the information stored on personnel, training and recruitment and information processing features used. In respect of the latter aim, the sample is split according to organizational size, and the amount of time the technology had been in place. Responses are scored on scales, which indicate the way in which information is used, reflecting the administrative/ analytical bifurcation identified in the HRIS literature. The paper then evaluates system usage in terms of previous research, its "sophistication", and other debates, which apply to larger firms.

IT in HRM: the story so far

Despite more recent claims suggesting that HRM is a laggard in terms of IT usage (Kinnie and Arthurs, 1996; Hall and Torrington, 1986), this was not the case 30 years ago. Beginning in the 1960s, personnel management was an early candidate for office automation in payroll, benefits administration and other transaction processing applications such as employee record holding (Martinsons, 1994). Typically this information was held on a mainframe in flat file format with the databases being interrogated via simple keyword searches. Since then, computer use in HR has been characterized by "alternating periods of slow and rapid growth" (McKay and Torrington, 1986, p. 3) from less than 2 per cent in 1966 to 68 per cent in 1984.

Growth in a strategically focused HRM ethos produced an increase in demand for useful information about the human resource. HR scholars in the UK and USA were calling for HR practitioners to innovate in their IT usage, arguing that resulting new roles for the HR department would emerge: "information centre", "internal consultant" and "change agent" (Torrington and Hall, 1989, in the UK) and "service provider", "cost manager", "business partner", "facilitator", "employee advocate" and "consultant" (Wiley, 1992, in the USA). Although the conclusions of various case studies of HRIS which emerged in the pre-Windows era fell somewhat short of this vision (Green, 1987; Carolin and Evans, 1988; Winsor, 1988; Kossek *et al.,* 1994; Kinnie and Arthurs, 1996) Windows prompted the birth of many smaller software houses writing affordable, easily customizable, modular HRISs. The reporting capabilities of these products were more sophisticated than their mainframe-based

predecessors, and they could hold information about every aspect of the human resource function.

Despite some conflicting evidence (Hall and Torrington, 1998; Cully *et al.* 1999)[1] suggestions of a perceived increase in the strategic influence of HRM and continued devolution of HR practice to the line (IES/IPD, 1997) implies a central role for HRISs in supporting the HR function and increasing its value to the organization (e.g. through intranets and expert systems). This shift to a "harder" focused HR department is also identified by Truss *et al.* (1997) who found that whilst organizations concentrated their rhetoric on the soft, commitment model , their employees reported that they were subject to harder, more quantified forms of control. The next section examines the nature of contemporary HRISs and explores how they might be seen to be more compatible with the harder model of HRM.

The nature, structure and use of an HRIS

Tannenbaum (1990) defined a HRIS as one which is used to acquire, store, manipulate, analyse, retrieve and distribute information about an organization's human resources. In practice, there is a bifurcation in the analysis of HRIS usage, with literature predicting that there will be at least two extremes of use. For example, Kovach and Cathcart (1999) noted that HRIS information could be used, first, for administrative purposes which reduce costs and time and, second, the more analytical decision support. Similarly, Martinsons (1994) classified different types of HRIS usage according to its degree of sophistication. He argued that payroll and benefits administration, and the keeping of employee and absence records electronically was "unsophisticated", because of its electronic replication of the contents of the HR department's filing cabinet. He also describes this as "simple minded automation" (Martinsons, 1996, p. 36). On the other hand, use of IT in recruitment and selection, training and development, HR planning and performance appraisal was characterized as "sophisticated", because of the information generated to provide support for decisions which involve expert judgement, and more advanced manipulation of information about the human resource which would reflect a "hard HRM" ethos. This paper adopts a similar stance in relation to the analysis of information usage data, classifying it as either "administrative" or "analytical" in character.

Survey results have consistently demonstrated the unadventurous use of HRIS output by HR practitioners. In 1986, most organizations in Hall and Torrington's (1986) sample were using IT as a workhorse of the personnel function, easing the administrative burden of record keeping and pay administration, rather than the agile thoroughbred: forecasting, analysing and supporting decision making. Empirical reports since then have indicated that little has changed (Kinnie and Arthurs, 1996; IES/IPD, 1997, 1998, 1999).

Reasons for this low level usage have been thought to stem from various factors in the environment of an HR department: elements such as organizational size, HRISs time in use, culture, strategy, power and politics and

IT skills have all been examined in the past. Broderick and Boudreau (1992) hypothesized that HRIS system usage was determined by human resources strategy, describing a matching process between different strategies and different system usage. Where strategies were to reduce cost, a "transaction system" based on computerization of more simple HR administration resulted: this would equate to the "unsophisticated" uses described by Martinsons and characterize the majority of reported UK use to date. A quality based strategy matched an expert systems approach (see Martinsons, 1996), whilst decision support systems match an innovation strategy. The Institute of Employment studies (IES/IPD, 1998) suggested that an important determinant of the respondent's usage of their system was the length of time they had been using it, finding an inverse relationship between system use time and user satisfaction.

A relationship between organizational size and HRIS usage was first identified by Hall and Torrington (1986). Despite a focus on the larger organization Thaler-Carter (1998) observes that there may be two fundamental differences between the smaller organization purchasing a HRIS, and the larger firm: cost and risk. Clearly a small firm would not be able to afford and would not necessarily need the complexity of the large enterprise resource planning (ERP) systems such as Peoplesoft or SAP. Risk is more pervasive as the small firm may find it more difficult to absorb downtime, training time and teething problems associated with implementing new software. Thus, according to Thaler-Carter's evidence the smaller firm would be more cautious in the system it adopted, and thus take longer to develop more "sophisticated" uses of the information it produces. Size and use time are thus directly implicated in usage outcomes for small businesses. This argument is also supported by Martinsons (1994), who found that in Hong Kong and Canada, HRISs were significantly more common in larger companies than smaller ones, although given the rise in affordable technology and the explicit marketing of HRIS at the small business sector, this scenario may have changed.

The influence of more complex contextual factors on HRIS usage was investigated by Kossek *et al.* (1994) and Kinnie and Arthurs (1996). The former, in arguing that HRIS use produced and reproduced HRIS use culture, identified four distinct, pervasive and empirically grounded cultural views of HRIS usage. "Computer jock phobia" referred to the tendency for mainstream HR practitioners to ghettoize the department's "computer guru" (Torrington and Hall, 1989), and hence justify the non-acquisition of HRIS skills for themselves. "Gradual automators" use of HRIS is characterized by the time and efficiency savings in computerization of the HR function, which also refers to the type of observed usage in the UK. "Corporate HRIS resistors" who claim ignorance of HRIS, and "Information brokers", who conform with the type of roles for HR envisioned by Wiley (1992) and Torrington and Hall (1989), were the other cultural types identified. This complements Kinnie and Arthurs's (1996) examination of other contextual factors such as departmental structure (in the presence of an HR director), power and politics (referring to the HR

department's holding of key information, and its pursuit of a cost reduction strategy to satisfy business aims) and HR practitioners' IT skills (confirmed by Haines and Petit, 1997) as enabling factors in HRIS usage *per se*. In the light of the above, the following section now presents the research questions addressed by this paper.

Research questions

The data address the following questions of an independent sample:

- What is the likelihood of smaller firms using HRIS?
- What is the relationship between system use and the total number of people employed by an organization?
- What is the relationship between system use and the time in use of the HRIS?
- Does HRIS use simply replicate the filing cabinet or is the information analysed in any way?
- How likely are respondents to use technology in the areas of appraisal, training and recruitment?
- How do the results reflect upon the existing literature?

Method

Potential respondents were randomly selected from the Financial Analysis Made Easy (FAME) database, the only search parameter being numbers employed. A postal survey was used to collect data for reasons of temporal expediency.

The survey instrument was not designed to ascertain the respondents' attitudes towards the system, but focused on whether they used information technology in various areas of the HR process, and what features of their system they used most frequently in the management of the organization's human resources. This necessitated defining relevant system features that would apply to all of the HRISs that could be used. This was accomplished in several ways. First, sales and marketing information from 47 HRIS vendors was collected and analysed manually. The analysis produced a core of system features that were common to all the products on sale. These formed the core question items. Meetings were then arranged with two suppliers wherein the content of the survey was discussed, in particular how the systems might be used by the respondents, and how the respondents might interpret the question items. Given the widespread use of survey based methods in information systems (IS) research (see www.misq.org/discovery/surveys98/surveys.html for a very comprehensive collection of references, constructs and question items of surveys used in IS research), a discussion with users and suppliers of how respondents might interpret question items was of particular relevance[2]. Each question item was modified to refer to a generic area of the HR process and functions available in the hypothetical standard HRIS. The results of the

discussion indicated that there would be little room for misinterpretation of the generic software functionality implied in each question item. For example, in addressing recruitment software, the question items were structured and ordered according to the different sequential stages of the recruitment process, the respondents being asked whether they used HRIS during any of those stages: applicant screening, applicant tracking, interview management, skills matching, media response analysis and budget control. The survey was then piloted on a small group of users from one of the suppliers' user groups.

The final version of the survey was divided up into six sections: use of information in core personnel administration; training; recruitment; additional areas – payroll, pensions, cars/other benefits, time and attendance, health and safety; data manipulation and management, with an additional section at the beginning collecting information used to profile each respondent. In this way the structure of the survey mirrors that of a hypothetical standard Windows-based HRIS.

Each question asked respondents to indicate whether they used a particular technological feature or not. The survey yielded nominal data in the first instance, with the responses being pre-coded, and upon scoring, ordinal data. The data were analysed using SPSS. Responses from each section of the questionnaire were scored on scales developed following case study work, which examined five cases of technology use in personnel departments. Within each section, items were designated an "information type" category, according to their people or organization orientation in the case of section one, and administrative vs analytical orientation in sections two to five. The responses were scored by the researcher on a rank order scale of 1 to 7 and the scales indicated, for each section, whether the responses showed a balance in favour of which type of information. Each item in the survey was weighted in terms of its score on the scale ensuring each category of items had an equal maximum score. This weight was determined by the number of items in each category.

For example, in the "information processing features" section, items: customisation; help; security; import/export; scanning; diary and global update each had a weight of 1, giving a maximum score of 7. This constituted the "administrative" category, since each of these features was used in data administration rather than analysis. Items: report generator; audit trail; salary modelling; point in time and custom questionnaire constituted the "analytical" category and each had a weight of 1.7, also giving a maximum score of 7. This is taken to be an indicator of the predominant emphasis in the use of the information by the respondents.

Respondent profile
A total of 470 questionnaires were posted to respondents, 127 of which were returned. Out of these, 115 were considered usable for statistical purposes. This represented a response rate of 24.4 per cent. Numbers employed ranged from one to 1,500 employees, in order to facilitate some comparison when questions concerning the smaller business were being addressed. Of the 115 responses

returned, 65 (56 per cent) employed between one and 500 people, 30 (26 per cent) employed between 500-1,000 people and 20 (17 per cent) employed between 1,000-1,500 people. Of the respondents, 64.3 per cent were located in the service sector (the main industries represented were financial services (14 per cent), IT (12 per cent), corporate services (7.8 per cent) building services (7 per cent)) and 35.7 per cent in the manufacturing sector (for example, engineering (14 per cent), general manufacturing (6.1 per cent), automotive (4.3 per cent)). Of the respondents, 63.5 per cent reported that they were using specialist HR software: the rest classified themselves as non users. Furthermore, of the 36.5 per cent of the sample who did not use HRIS, just over half (51 per cent) employed less than 500 people. A clear user-non-user majority emerged in every other category above 500 employees. The majority of respondents were personnel or human resources managers (36.5 per cent) with personnel officers being the second most frequent respondents (18.3 per cent). Respondents who were not from the personnel department constituted non-HR directors (10.4 per cent), other managers (6.1 per cent) and IT specialists (3.5 per cent).

In order to address the research questions, data were analysed first, by using frequency tables and contingency tables to view simple patterns in the data. However, after scoring each section on the scales, a series of Levene's T Tests investigated the degree of difference in mean scores between SMEs (under 500 employees) and other organizations in the sample. Spearman's rank order correlations were performed between these scores and respondent profile variables representing the total number of people employed by the respondents and the length of time the system had been in place. Kruskal-Wallis H tests were conducted to test for significant differences between mean scores on the scales with the same respondent profile variables.

Results
In the results section, respondent profiles in terms of their HRIS usage, numbers employed and their position within their organization are discussed first. Then, the results in terms of information being stored, and features being used are presented: basic database information; training information; recruitment information and the balance of information in these core areas is discussed. Then results concerning additional modules and information management features are presented, succeeded by the results of statistical tests conducted on the data. In analysing these data it was assumed that in each organization each employee had a computerized record.

Most respondents were relatively recent users of HRIS, the majority having used their current systems for up to four years (64.4 per cent), with an additional 19.2 per cent having used their current systems for up to eight years. The majority of the sample had purchased their software in the 1990s although a small proportion (8.2 per cent) were using antiquated mainframe systems which were up to 20 years old. Those organizations with under 500 employees in particular had purchased their software in the last four years, providing evidence which confirms reports from the popular personnel press concerning the

availability of cheaper, Windows-based HRIS to the smaller organization. This was confirmed further when the type of software being used by the organizations was examined. Over one-third of the sample (35.6 per cent) were replacing manual files with their first HRIS, having never been computerized previously. For those organizations replacing manual files, ASR was the most popular product: this organization deliberately markets its products as cheap, flexible, easy to install and easily customizable for the small, first-time HRIS user.

Information usage in core administration, training and recruitment
Data from the main part of the survey asked whether there is electronic information stored and used in core HR administration, recruitment and training areas. Results reflected key aspects of academic findings and practitioner opinion. A priori it appeared that in core HR administration, training and recruitment, information was being stored primarily for administrative ends, rather than any sort of analytical or decision support ends.

For example, core personnel information was predominantly held in areas concerned with the organizational present: in other words that which is involved in the day-to-day running of the human resource. Current employment details (94.5 per cent), and the organization's salary structure (80.8 per cent) were the most frequently cited areas of personnel information which were stored electronically. Organizational jobs and positions within the organization (78.1 per cent) and absence monitoring (76.7 per cent) came next. Information concerning HR planning and medical information was not considered important.

This pattern persisted when respondents were asked about HRIS usage in the training area. Out of the 73 respondents who were using a personnel database, only 42.3 per cent were holding information on training in their personnel databases. Of those who were using HRIS in the training area, the features most frequently used were monitoring and administrative: to store course administration (70 per cent) and evaluation (50 per cent) information. For those not holding their training course information on their database, its most popular alternative location was on manual records. Of those respondents, 48.8 per cent were aware of an option to introduce training information into their personnel databases and 45.5 per cent were planning to implement the technology, within one year.

Even fewer respondents were holding information electronically in the recruitment area: just over one-third reported that they were doing so. The most frequent use for recruitment software was to track applicants through the recruitment process (92.3 per cent), the next most frequent use being interview management (73.1 per cent), followed by media response analysis (69.2 per cent). Unsurprisingly, more analytical tasks such as skills matching (32.0 per cent) did not score as highly, nor did applicant screening. Budget control, in the cases of both training and recruitment was kept away from the HRIS, being conducted manually in all cases. Table I summarizes these results, listing the two most popular uses of information in each area, and Figure 1 shows overall HRIS feature usage for core modules in the sample.

Information balance
This part of the analysis is concerned with a more detailed examination of the nature of information held by the respondents, asking whether information usage was predominantly filing cabinet replication (i.e. administrative) or whether it included data manipulation and analysis (i.e. analytical). The last

Section	Users (%)	Two most popular uses of HRIS	Popular use users (%)
1. Core administration	94.5	Current employee information	94.5
		Organizational salary structure	80.8
2. Training	42.3	Course administration	70
		Course evaluation	50
3. Recruitment	35.6	Applicant tracking	92.3
		Interview management	73.1

Table I.
The two most popular uses of HRIS information, for core personnel administration, training and recruitment
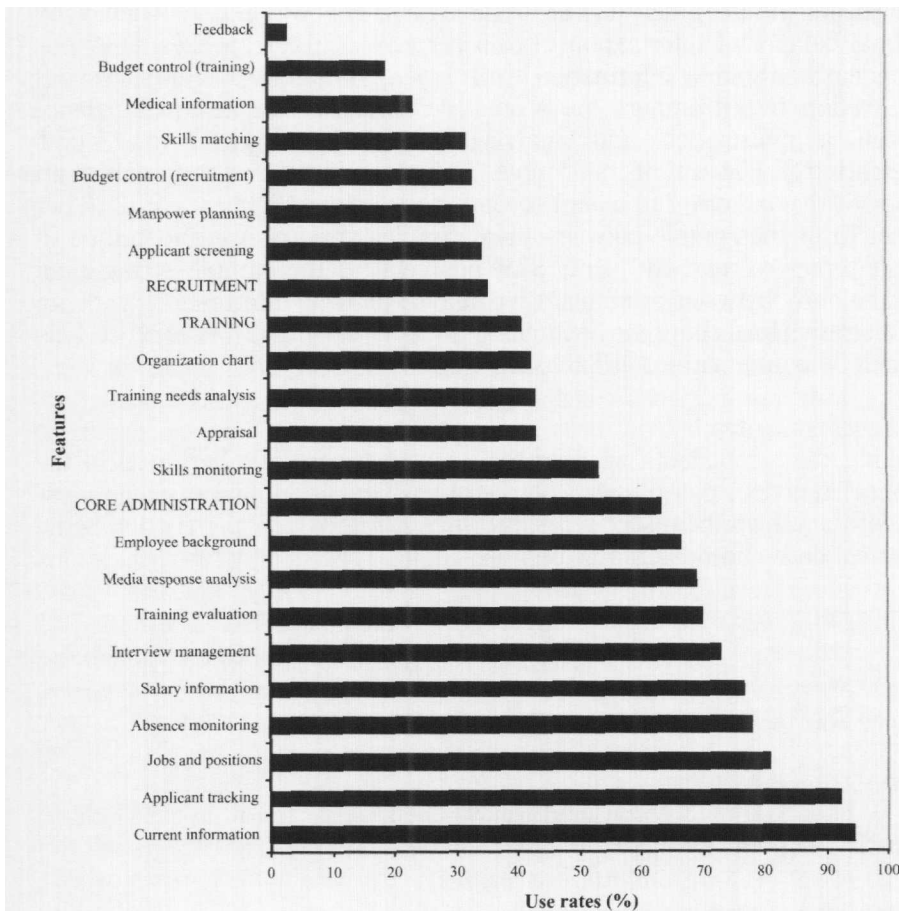

Figure 1.
HRIS feature usage, core modules (personnel, training and recruitment)

section noted that there was a skew towards administration in the most popular information categories held. However, this needs to be clarified. In the case of core personnel information, the concept of balance would need to address the extent to which both personal and organizational information is held in order that the full person/organization picture be represented in the databases. For sections two and three, whether training and recruitment information is oriented to administration or analysis is more pertinent: it was earlier outlined that information in these areas can be used for decision support. To explore this idea, the responses were then scored on a scale of one to seven, relating to people (low score) vs organizational (high score) information for section one and administrative vs analytical for sections two and three. The mid point (4) represented an equal balance between the two.

The scores in each section clustered around the midpoint of the scale with deviation from the midpoint extending one point in either direction. For example in section one, core administration, the most popular balance of information in the respondents' systems (32.9 per cent) was towards information about the individual rather than the organization. This was closely followed by an equal balance of information in 31.5 per cent of the responses. Only one respondent was holding information in all of the areas specified in the survey.

In section two (training), the scores were very close: an equal balance between administration and analysis related information was found, representing 29 per cent of the sample. The remaining scores in favour of an administrative balance came joint second representing 45.2 per cent (22.6 per cent each) of the sample between them. Similar patterns were identified in section three (recruitment) with 37.9 per cent of the sample striking an equal balance between administrative and analytical information, with an administrative bias being the next most frequent response (27.3 per cent). This information is summarised in Table II.

Additional features
In asking the respondents whether they used software in other areas of the personnel function, payroll (80.8 per cent) was the additional package most frequently used by the respondents, health and safety (13.7 per cent) was the least frequently used, perhaps because of its specialist nature. Questions

Section	Overall information balance ranks 1 and 2	% Response rate
1. Core administration	More person than organization Equal	32.9 31.5
2. Training	Equal Admin. over analysis = analysis over admin.	29 22.6 each
3. Recruitment	Equal Admin. over analysis	37.9 27.3

Table II.
Overall information balance ranks, sections 1-3

concerning the integration of modules produced some interesting results. For payroll packages, health and safety packages, cars/benefits packages, training and recruitment packages, over half, but under two-thirds of them were integrated into the main personnel database. The package with the highest level of integration with the core personnel database was time and attendance (73.1 per cent), and this is perhaps of most interest. This may represent a deliberate control and employee monitoring strategy on the part of these particular respondents. Furthermore, the organization-wide span of systems such as time and attendance would indicate a more hard organizational orientation on the part of these personnel functions.

Information management (IM) features
Finally, respondents were asked whether they possessed, and then whether they were using, certain information management features available in their software packages. Twelve core features were identified: screen customization, on line help, data security, import and export, scanning and imaging, diary, global update, audit trail, salary modelling, point in time analysis, custom questionnaire design and report generator. For the purposes of scoring, the former seven features were identified as information management features, whilst the latter five features were identified as information analysis features reflecting the bifurcation in use identified in the literature.

Each IM feature had a relatively high usage rate. For example, every single respondent whose system had a help facility had used it and 93.9 per cent of users were operating with their system's security features in place. Similarly data import and export, customization and global update all had use rates over 80 per cent. The two most popular analysis tools identified were reporting (97.3 per cent) and salary modelling (80.8 per cent). However, the reporting facility is almost universally used whereas salary modelling is used by only half of the respondents whose systems have it. Similarly, despite being identified by only 25 per cent of respondents, 72.2 per cent of those used point in time analysis: a similar trend is observed for audit trail: it would appear that those who have it, use it.

As with the other sections of the survey, responses were scored on a scale indicating the balance between the use of information management and information analysis features. A total of 63 per cent of the sample focused their activities on data management, rather than data analysis, whilst a much smaller proportion of respondents indicated a balance in favour of analysis (24.7 per cent). The next section discusses these results in terms of the statistical tests performed on the data, the research questions posed at the beginning of the paper, and previous literature.

The research questions
In relation to the more detailed research questions concerning the relationship between the nature of system usage and the overall number of employees in the organization, as well as the amount of time the organization has used its

software, a series of statistical tests were performed on the data as outlined in the method. The results offer some answers to the questions posed earlier in the paper and these are now addressed in turn.

Is the use of information related to the number of people employed by the organization? At a significance level of 0.05 per cent, statistically significant positive correlations were found between score 1, from the first (referring to the type of core personnel database information held) and score 5, from the last (referring to the type of information processing features which were used by the respondents) section of the survey and the number of employees in the organization. The former indicates that the more people who are employed by the organization, the more likely the personnel function is to hold information both on the individual and the organization. This was confirmed by the results of a Levene's T test which found a significant difference ($p = 0.034$ – equal variances not assumed) between the mean scores on score one, for smaller (under 500 employees) and larger organizations. It would also suggest that people/organizational matching processes are more likely to occur the larger the organization, with organization structure being more clearly defined. Furthermore, the personnel function is doing more with this information: a significant correlation on scale five indicates that there is more data analysis being performed than simple data management with the extra features that a typical HRIS would contain when the organization has more employees. Interestingly, analysis by the operational sector of the organization revealed no significant difference in information usage.

The Kruskal Wallis one-way ANOVA test revealed similar results (see Table III). At the 0.05 per cent significance level, mean scores for each category of responses in score 5, in terms of their number of employees were significantly different, the more people the company employed. This was similar for score 1 with a significance level of 0.06 per cent. No significant results were found in either test for scores two and three. This is because of the small sample size in relation to the use of IT in the areas of training and recruitment. The next section considers the statistical results for the final research question.

Table III.
Results of the statistical tests to determine: if information usage is correlated with the number of employees in the organization; and whether there is a significant difference in information usage for organizations of differing size

| | Number of employees | |
Information usage score	Spearman's r/o correlation coefficient	Kruskal Wallis H test chi square
Score 1 (core personnel)	0.28**	10.4*
Score 2 (training)	–0.16	1.19
Score 3 (recruitment)	0.18	7.09
Score 4 (additional modules)	–0.2*	5.86
Score 5 (data management)	0.22**	11.3**

Notes: *$p < 0.1$ per cent; **$p < 0.05$ per cent

Is the use of information related to the amount of time the HRIS has been in place?. These results faintly echoed the findings of the 1998 IES/IPD survey which revealed that the less time for which HRISs had been used, the more likely the user was to be satisfied with it (i.e. the two are negatively correlated). It is assumed that the more recent systems are better designed, and better suited to the needs of their customers. Three of the relationships uncovered were negative, but none of these were statistically significant, exhibited very low correlations, and are shown in Table IV. On examination of the results of the Kruskal Wallis one-way ANOVAs, one statistically significant relationship was found. Scores on score 4, referring to the number of extra features used, were significantly different for each category of respondents in terms of their system usetime. The direction of this relationship is hinted at by the Spearman's result for score 4 – a negative relationship at a significance level of 0.12. This indicates that those who have been using their systems for shorter periods of time are more likely to be using additional modules. This would perhaps reflect the availability and affordability of such packages. This also reflects the IES/IPDs observation of an inverse relationship between system use-time and satisfaction with the HRIS.

Discussion

These results are of interest for several reasons. They indicate that organizational size is a clear determinant of, first, whether an organization has an HRIS at all and, second, whether it adopts certain modules (e.g. core personnel admin) over others (e.g. training and administration), and third how information is used and analysed. Similarly, the type of software chosen by new HRIS users was typically a low-cost option (ASR software). In-house database development was an equally popular option for the smaller organization adopting HRIS for the first time, which is associated with low risk. These results provide empirical support for Thaler-Carter's (1998) observations that the smaller organization would go for low cost and low risk HRIS purchases, typically cheaper, more flexible software or in-house HRIS development. It also echoes early IPD surveys, which reported that few small firms were using computers in their personnel functions because of the cost involved.

Information usage scores	HRIS's length of time in use	
	Spearman's r/o correlation coefficient	Kruskal Wallis H test Chi-square
Score 1(core personnel)	– 0.04	5.93
Score 2 (training)	– 0.11	1.27
Score 3 (recruitment)	0.06	0.71
Score 4 (additional modules)	– 1.6	10.75**
Score 5 (data management)	0.08	6.29

Notes: $*p < 0.1$ per cent; $**p < 0.05$ per cent

Table IV.
Results of the statistical tests to determine: if information usage is correlated with the length of time the HRIS has been in use; and whether there is a significant difference in information usage for organizations who have used their HRIS for different amounts of time

Similarly, of those who used HRIS software, less than half of the sample used it in training (42.3 per cent) and recruitment (35.6 per cent), and only very few of these employed less than 500 people. Perhaps this is not surprising. Core personnel database modules have a small amount of space dedicated to the storage of information about training and recruitment anyway: for cost minimizing small firms (see Scase, 1995), an additional module is an additional expense, rather than an investment. So despite Haines and Petit's (1997) dismissal of size as an important factor in HRIS usage for larger organizations, this survey lends support to the influence of organization size and HRIS usage for the smaller organization.

To locate these findings within the broader debates reviewed earlier, usage patterns identified could be described as "transaction based processes" (Broderick and Boudreau, 1992), "unsophisticated" (Martinsons, 1994, 1996) reflecting a culture of "gradual automation" (Kossek *et al.*, 1994). The results also lend empirical support to Martinsons' (1994) assertions that, in the main, only the most basic and relevant of information will be held in the HRIS, and that this will be less common amongst smaller firms.

Results concerning information balance support this view. Whilst an equal balance of information usage between administrative and analytical functions in the training and recruitment areas is cause for optimism, the administrative rather than analytical focus in other areas of the survey, especially in section five (which enquired as to which data management and manipulation features were being used), indicates that for the majority of users, data administration and management, rather than manipulation is the norm. As Kovach and Cathcart (1999, p. 277) observe:

> The key is to focus on making better decisions, not just producing data faster ... however, the vast majority of such applications focus on administrative tasks, rather than decision support. While supporting decisions is more difficult, it also seems to offer the greatest opportunity to affect the HR profession.

Will the future of HRIS be in decision support? If this is a possibility, these results (especially on section five) do not seem to suggest that this is the direction of travel for the majority of HRIS users (especially small ones). Whilst a cost-based strategy concurs with the hard HRM ethos, and *would* increase the value of HR to the business by decreasing costs (Kinnie and Arthurs, 1996), the lack of data manipulation as indicated by score 5 negates any significant level of the type of data usage which would support decision and strategy making. Given this survey's highlighting of a focus on the administrative and electronic replication of the filing cabinet, HRM still seems to be the laggard in running its own systems and processes in this way.

This survey, and other work, suggests that context (departmental, organizational and environmental) has a role to play in this regard (Kinnie and Arthurs, 1996; Kossek *et al.*, 1994) which extends beyond variables such as technology configuration, time in use, and the size of the organization. Despite finding correlations between use scores and size each of these correlations were relatively weak, being of the order of 0.3 or less (Bryman and Cramer, 1994).

This, in addition to there being no sectoral differences in information usage, indicates that there are more local factors about which the survey did not enquire, and which are not easily measured statistically, that would explain its results. Factors such as departmental structure, existing knowledge and skills, power and politics (Kinnie and Arthurs, 1996) culture (Kossek *et al.*, 1994) and sector are at the heart of this analysis. There also remains a question whether, given the reported downsizing outcomes of HRIS implementation in North America, development in this direction is desirable at all. The issue surely is whether individual personnel functions are making the most of their HRIS given the contextual constraints of their own organizational settings: this survey shows that those who can use HRIS more analytically, do.

Conclusion
In summary, this survey has revealed the following:

- The more people who are employed by the organization, the more likely the HR function is to hold information electronically both on the individual and the organization.
- The more people who are employed by the organization the more likely it is that information analysis with the HRIS will occur.
- Only half of the firms who employ less than 500 employees use HRIS, and those who do only use core HR modules, rather than additional training and recruitment modules.
- The more people employed by the organization the less likely it is to purchase additional non core HR modules.
- Organizations who have purchased HRISs recently are more likely to buy additional modules.
- In general HRISs are still being used administratively, although those who use HRIS in training and recruitment are beginning to move away from this.
- Time and attendance was the most frequently integrated additional module.

Whilst this work had confirmed existing studies into HRIS, it provides a platform for future work in this area, which should concentrate on a number of issues. First, more longitudinal survey work to map changes in relation to information storage and the type of data manipulation being undertaken by users should be undertaken. Second, an interesting area of study is the comparison of HIRS suppliers' products, contexts and histories, with the way in which they are taken and adapted by their various users. This will enable a detailed examination of the way in which implementation and usage contexts affects the mutation of similar pieces of software. Finally, case by case comparison and theorisation of HRIS usage to understand the contextual dynamics of personnel functions using this technology.

Notes

1. According to Cully et al. (1999) "stategic influence" implies a number of activities: the presence of a strategic plan encompassing employee development, the presence of an employee relations specialist on the board and Investors in People. While 57 per cent of organizations they surveyed had a strategic plan, 64 per cent had board level representation, and 39 per cent had IiP, only 21 per cent had all three in place. This contrasts with the findings of the IES which concentrate on personnel and HR specialists' perceptions of strategic influence.

2. Two suppliers participated in the evaluation of the questionnaire. One invited the principal researcher to a product information day, whereupon a further meeting was arranged. The second invited the researcher to a user group meeting, where some time was spent reviewing question items, the supplier having seen the survey beforehand. Modification on section five was suggested as a result of these meetings. Then, representatives from four user organizations volunteered to spend some time discussing the survey. One organizational representative from each member of the user group (around 20 responses) then piloted the instrument.

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