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Computers in personnel management — a South African survey

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The personnel function currently faces many challenges and threats. Not the least of these is the growing erosion of its status at the strategic management level. The absence of a sound technological foundation is one of the contributory factors. The authors examine the contribution that computer-based personnel information systems are making towards the rectification of this problem. The availability of current computer-based decision aids is identified as well as the extent to which this technology is integrated within the personnel function in South African organizations.

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Die personeelfunksie staar tans heelwat veranderinge en uitdagings in die gesig. 'n Groot bedreiging is byvoorbeeld die toenemende afname in status op die strategiese bestuursvlak. Die afwesigheid van deeglikgefundeerde tegnologie is slegs een van die bydraende faktore. Hierdie artikel ondersoek die bydrae wat rekenaargefundeerde personeel-inligtingstelsels tot die regstelling van die probleem maak. Die beskikbaarheid van hedendaagse rekenaargefundeerde hulpmiddels vir besluitneming word geïdentifiseer, tesame met 'n aanduiding van die mate waartoe hierdie tegnologie geïntegreer word in die personeelfunksie in Suid Afrikaanse organisasies.

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Introduction

As the personnel department strives for ascendancy in the corporate decision-making process, it must move from being primarily an administrative function and assume the more challenging role of effective human resource planning. To achieve this, the personnel manager must have ready access to appropriate and precise information on which to base meaningful decisions. One important element in this information generation process is the availability of appropriate decision-making tools. Another is the degree of integration of new technological aids to decision-making in the personnel function.

In this article both aspects are examined in the South African context. Firstly, computer-based decision aids currently available to personnel practitioners are reviewed and secondly, current and desired computing practices within the personnel function are examined. Finally, conclusions are drawn concerning the state of the art with respect to the role of computers in personnel, both in terms of what is currently offered and what is currently used and required.

The personnel practitioner and the computer.

Computer-based information systems are already regarded as an indispensable tool for generating information for decision-making in the other areas of management such as finance, marketing, and production. The personnel practitioner, on the other hand, appears to be lagging behind in the application of new information technology and is thereby jeopardizing the opportunity to earn a seat around the boardroom table. Manning (1983:74) believed that personnel managers were losing both credibility and status through not adequately confronting the challenges technological development presented to them. Ivy (1982:1) expressed the opinion that personnel practitioners still experienced a credibility problem which adversely affected their acceptance and recognition as a professional corps. This statement was based on the fact that the personnel practitioner often appeared to be unable to support his proposals and reports with factual evidence based on valid and reliable information. Fitz-Enz (1982:6–14) also stressed the necessity for personnel practitioners to support their actions with quantified information. He pointed out that personnel practitioners were not likely to be accorded the recognition they deserved until they had been successful in quantifying the personnel function and convincing top management that their proposals were based on facts rather than intuitive reasoning as to the contribution of these proposals to organizational results.

This situation can be ascribed to at least three factors:

- (i) Historically, their formal training is mostly in the behavioural sciences. Quantitative techniques, information systems, and computer literacy generally form a very small part of their curricula.
- (ii) The personnel function has been ignored largely by the information scientists with the consequent lack of appropriate decision aids.
- (iii) The personnel function has traditionally not been regarded as a profit centre with the consequent assignment of a low priority for the implementation of advanced technological decision-making aids. 'Many organisations virtually ignore the need for computerised systems in this area due to the difficulties involved in quantifying the benefits to be derived' (Duursema, 1984:16).

Manning (1983:75) maintained that 'of all the major areas of management, Personnel has the weakest conceptual base and poorest technology'. However, problems such as over-manning, skill shortages, manpower productivity and inadequate career planning are of a long-term nature and necessitate the need for the personnel manager to become involved in strategic decision-making (Iwanski, 1985:10; Duursema, 1984:16). In order therefore 'to establish personnel in the driving seat of corporate development', there is a need for them to prove their effectiveness through the successful use of the new and better tools available to record, measure and enhance the performance of the organization (Manning, 1983:77). 'To fully achieve', according to Iwanski (1985:11), 'personnel managers must use the same measurement tools line managers use'.

A survey by Richards-Carpenter (1982:30) conducted on over 1000 IPM respondents in the United Kingdom, revealed that the majority of respondents had no computerized personnel information system, yet more than 80% expressed the need for such systems. This need also served as the theme for the First National Conference and Exhibition of Computers in Personnel which was jointly sponsored by the Institute of Personnel Management and the Institute of Manpower Studies in the U.K. (Richards-Carpenter, 1982:25).

The need to use the computer in personnel activities has also been expressed in the United States. The theme of the 13th Annual International Conference on Human Resource Management Systems (1982) was 'Computer-based Human Resource Systems'. The organizers emphasized that bottom-line human resource information systems was their goal. A survey conducted by Schuster on 181 manufacturing, financial and commercial organizations in 1982 identified the software programs then in use or planned to be put into use within one year (Klatt, Murdick & Schuster, 1985:648). The results indicated that, only for large personnel organizations, were computer programs for personnel data storage and replay widely used.

In South Africa, there is little published information on the role of computers in personnel. Duursema (1984:16), however, summarized the position here clearly by stating that 'in a competitive business environment no organisation — in the long term — can afford to do without computerised personnel systems. The question is not whether to computerise, but how to obtain the best return on the investment'. The need to use sound computer-based decision support systems is therefore inevitable.

The above discussion clearly indicates the growing call for a more professionally orientated personnel function supported by appropriate technological decision aids such as computer-based personnel information systems. Manning (1983:77) in effect called for 'a coherent and relevant body of technology

to support personnel's role in the strategic process.' This shifts the focus of application beyond the mere administrative activities. Ivy (1982:1 – 17) and Willie & Hammond (1981: 41 – 68) in fact identified and discussed the areas of personnel management in which a computer-based decision support system can be of use. From this it is evident that there exists virtually no aspect of personnel management in respect of which such a system is unnecessary.

The other side of the coin, however, involves the availability of appropriate personnel systems.

According to Ive & Bowran (1982:46) many packages sold as 'personnel systems' are little more than generalized data base packages. This view is reinforced by Klatt, Murdick & Schuster (1985:635) who identified three kinds of human resource information systems in companies today. They are: '(a) manual systems with manually operated files which are found in very small companies and in backward larger companies; (b) computerised files and computerised data processing, which are found in most progressive companies; and (c) fully computerised systems with data base management systems, towards which a few of the largest, most progressive companies are working.' Most applications of computers to personnel, according to Klatt, *et al.* (1985:637) fall into category (b). The nature of this computerized HR management information systems consists of 'linked data bases with "application programs" that store, manipulate, and retrieve data and provide reports'.

The terms 'Information Systems' and 'Decision Support Systems' are beginning to be used extensively in describing computer-based systems. It is appropriate, however, to draw a distinction between an information system and a decision support system. Classical information systems centre on producing periodic reports prepared principally for lower and middle management not only to show the results of past operations, but also to assist them in controlling current operations that are definable within a well-structured framework (Thierauf 1982:22 – 23). The accent is not so much on the planning aspects of an organization as on the manipulation of historical data into alternative formats for control purposes. By contrast, decision support systems are a natural fusion of management information systems (data and reports) and management science (modelling and analysis) (Bennett 1983: 11). The emphasis is primarily on planning, using projective techniques — rather than control — and focuses on less structured decision areas where managerial judgement is still a major component of the decision-making process. This results in actions based on scientific and quantitative grounds (Ittmann 1985:5).

It should also be borne in mind that decision support systems 'vary greatly in the analytical tools they provide. Some have little other than the ability to take averages and totals. Others provide a rich and complex set of forecasting, time-series, correlation and other operational research tools' (Martin 1985:289). Therefore, systems offering decision support features should be carefully evaluated to establish their level of modelling and analytical capabilities.

A review of selected personnel systems in South Africa

In the personnel systems area, by far the majority of applications software available in South Africa currently relates to payroll and related processing (*Financial Mail* June 1985:lxiv). Almost 75% of all 35 the systems classified under 'payroll/personnel management' in the *Financial Mail Computer Buyer's Guide* are payroll-based systems. The remaining 25% of personnel systems listed (according to their descriptions)

offer a selection of data analysis referring to, *inter alia*, training, performance appraisal, and Sullivan code reporting. Two systems in particular, describe themselves as 'a complete human resource planning and information system for HR/personnel managers' and a system which 'integrates all human resource management applications from personnel and pay details to manpower planning' (:lxxvi).

However, although computerized payroll systems are in frequent use, 'they are either not geared to meet the specialised needs of modern day human resource management, or they lack the flexibility to cater for the diversity of information required' Duursema (1984:16).

To examine further the *capabilities* of certain applications software available in the personnel area, nine human resource information systems were identified and analysed.

The systems examined, together with configuration and software attributes are listed in Table 1. It should be noted that this review of selected personnel software systems is intended merely to indicate the existence of potentially useful decision tools in personnel. A complete evaluation of the limitations and capabilities of each system is not the purpose of this section.

Before a comparison can be made of the features, it should be noted that these systems can differ considerably with respect to a number of factors. These include, *inter alia* installation cost, maintenance cost, implementation time, the degree of system flexibility, the degree of computer expertise required by end-users, and user friendliness.

As seen from Table 1, available systems are a mix of mainframe and micro computer based. In terms of programming languages, with the exception of the FSA personnel system (written in BASIC), all the systems are developed using a fourth-generation language such as REVELATION, FOCUS or micro COBOL.

The numeric manipulation features of these systems all include interfaces with spreadsheets (especially LOTUS 1-2-3 in the case of the micro-based systems) and offer graphics

Table 1 Attributes of available personnel information systems in SA.

System	Storage	Hardware	Language
1. P-E CHRIS	512 K 10 Megabyte	Micro based	4GL REVELATION
2. FSA	256 K 10 Megabyte	Micro based	BASIC
3. ZARAB-HU Human resource manager	512 K 5 Megabyte	Micro based	4GL FOCUS
4. QPAC (and QPID)		Mainframe based	n/a
5. IBM HR system		Mainframe based	4th Generation system
6. SOFTEASE (Dataease, Graphease)	256 K 10 Megabyte	Micro based	4th Generation
7. ACCYSS	n/a	Micro based	4GL COBOL
8. Peterborough (Unipay, Unipension, Unipersonnel)		Mainframe based	n/a
9. MSA-expert series		Micro based	4th Generation

Source: Adapted from Gray, *et al.* (1985)

capabilities. MSA also offers interface capabilities with data base systems such as Data Base II and III. They all offer *ad hoc* and statutory reporting facilities to a greater or lesser degree (Gray, Korpershoek, Murray & Storti 1985: 30-31).

The general configurations of most of the applications software reviewed have a core system of human resource data — consisting of payroll and other personnel data — onto which expansion modules can be fitted to form a more powerful human resource system. These add-on modules are identified in Table 2. Before examining these expansion modules, it should be remembered that although these systems appear to share certain common features, they may well differ in their scope of data capturing, in their depth of analysis, and in the extent of their reporting and modelling capabilities. Only in-depth experience with each system will establish the extent of these limitations and capabilities. Common features therefore do not necessarily imply equal treatment by each system of the application area.

To provide a basis for comparison of these essentially expansion modules, the following classification scheme is used. The personnel function can be divided into five broad areas

Table 2 Classification of personnel systems by function

Function	System code*								
	1	2	3	4	5	6	7	8	9
Procurement									
Manpower planning	x	x	x	x				x	x
Recruitment	x	x	x	x	x			x	x
Selection	x			x	x				
Skills inventory			x		x	x		x	
Organization model	x		x	x	x				
Maintenance									
Wages & salary admin.	x	x	x	x	x	x	x	x	x
Pension admin.					x	x	x	x	x
Benefits admin.	x	x	x	x	x	x	x	x	x
Health & safety admin.						x			x
Discipline system			x		x			x	x
Statutory reports	x			x			x	x	
Salary surveys	x	x							
Industrial relations					x				x
Sullivan reporting			x	x		x			
Development									
Management development						x			
Training evaluation							x		
Training budgeting								x	
Career planning						x			x
Performance appraisal		x	x						x
Job evaluation		x	x	x		x			x
Forecasting & modelling				x	x	x			x
Integration									
Job design							x		
Work scheduling								x	
Job costing						x	x		x
Separation									
Layoff procedures								x	
Turnover analysis			x		x	x	x	x	x
Exit interviews								x	
Absenteeism profile			x		x	x	x	x	x
Decision support						x	x	x	x

Source: Adapted from Gray, *et al.* (1985: 34-35).

*The system code refers to the system identified in Table 1.

A cross placed in a particular cell implies that the corresponding system performs a particular function

namely procurement, maintenance, development, integration, and separation (Flippo 1984: vii-x). Within each broad function, a number of activities can be identified.

Table 2 indicates that the majority of systems record data and provide processing capabilities to assist the procurement, maintenance, and separation functions in personnel. The development and integration functions are, on the whole, inadequately catered for. Of interest are the systems classified as offering decision support. This facility offers modelling and forecasting capabilities of 'what if' type questions and/or goal-seeking capabilities. Bell (1982: 47) saw personnel management as benefitting greatly from a modelling capability being built into a computer-based decision support system. He saw modelling applications as the true benefits of computerization in the personnel function. 'It is here that computers really come into their own'.

This evidence indicates that applications software is available to a lesser or greater degree of sophistication. However, the comments of Martin (1985), Klatt, *et al.* (1985) and Ive & Bowran (1982) with respect to system configurations and capabilities are very relevant when examining various systems.

The conclusion that can be drawn is that although certain systems offer forward planning facilities in the form of modelling and forecasting capabilities, most of the systems available can still be referred to as reporting-based systems which manipulate historical data bases. 'What if' projections and goal-seeking are still relatively new concepts which are only now being incorporated into some personnel systems. These limitations notwithstanding, there appears to be available personnel systems which offer the personnel manager a planning tool to enhance the quality of information on which personnel decisions are taken.

Given that certain technological decision aids do exist in South Africa, the question arises as to the current penetration of computer-based personnel systems in South African organizations. In the next section the current role of computers in personnel management in South Africa is examined.

Major findings regarding the current and potential application of computers in personnel management

The survey results are based on the views of 86 organizations which responded to the mailed questionnaire out of a surveyed population of 300 companies.

Three aspects were examined:

- Firstly, areas in personnel management where the computer is *currently* being used are identified;
- secondly, areas in personnel management where *future computerization* (or assistance from the computer) is most desired are identified, and
- thirdly, *benefits derived* from current computerization in the personnel function are established.

An initial question attempted to gauge the emphasis personnel departments placed upon planning as opposed to the carrying out of administrative tasks. The assertion is made regularly that those in personnel management devote too little time and other personnel resources to both short-term and long-term planning for the optimal use of the organization's human assets. Conversely, too much effort is directed towards historical record-keeping and other administrative chores.

The results appear to substantiate this claim. Less than a third of all respondents devoted more than half of their personnel resources to management and planning whereas over two-thirds spent most of their effort on administrative activities.

Current computer application in personnel management

The use of computers in personnel can be divided into three broad areas, namely the *administrative* role, which is mainly the capture and replay of data (record keeping), *reporting* systems, and *planning and modelling* systems.

Within each category of application, a number of distinct activities are defined. In Table 3 the level of usage in each of the specific application areas is shown.

Administrative applications

As expected, the use of the computer for basic payroll processing is widespread. Over 80% of all respondents have their payroll system on computer.

The capture of personal data for employee records also appears to be well advanced. However, such data appear to be limited largely to basic demographic and job-related statistics. The capture of employee qualifications data is gaining ground, but that of job performance related data (useful for manpower planning) is not being undertaken by at least two-thirds of all respondents.

The computerization of labour relations data is almost non-existent. Only 7% of all respondents have moved into this area of personnel computerization.

Reporting systems

Reporting systems essentially involve massaging historical data, to extract summaries, identify trends and relationships. The information generated relates mainly to the internal environment of an organization.

On the whole, *compensation reporting* systems — as represented by salary analysis reports, labour costing/budgeting reports, and salary survey reports — are more prevalent amongst respondents than *manpower planning reporting* systems. This latter group includes age analysis reports, labour turnover analysis reports, skills inventory reports, merit award identification reports, promotion potential reports, managerial potential identification reports, and training needs identification reports.

Within compensation reporting systems, salary analysis reports and labour costing and budgeting reports are used by more respondents than are salary survey reports.

Manpower planning reports are confined mainly to age analysis-, and labour turnover analysis-reports. By far the majority of respondents are not using reporting systems that convey qualifications- and job performance-type information.

The almost complete absence of labour grievance analysis reports is symptomatic of the non-existence of a suitable labour relations data base.

Planning and modelling systems

Planning systems are future-orientated. Their role is to examine the likely outcomes of uncertain future events. Historical data are often the basis for these projections.

As seen from Table 3, computerized planning systems in the personnel field appear to be even more scarce than reporting systems.

Apart from the absence of suitable data bases which are necessary for planning and modelling systems, there is also a lack of emphasis on human resource planning where such systems would be used (as indicated by the responses to the initial question on resource distribution between planning and administrative activities).

Table 3 Levels of current computer usage in personnel management

	Extent of present usage.			Total usage response — average (partial + considerable)
	Not at all	Partly	Considerable	
Administrative				
– Basic payroll processing (cheques)	17	5	78	
– Employee records: Data capture				
• demographics (name, age, address, marital status, sex, etc.)	28	8	64	76%
• job related (title, salary, time in job, grade, pension, med. aid)	27	13	60	
• qualifications (academic, skills, experience, courses completed)	52	17	31	62%
• job performance (merit awards, promotability ratings, training needs identified, etc.)	67	20	13	
• labour relations (discipline, grievance, data, etc.)	93	4	3	41%
Reporting systems				
– salary analysis reports	33	19	48	
– labour costing/budgeting reports	38	23	39	59%
– salary survey reports	52	22	26	
– age analysis reports	48	16	36	37%
– labour turnover analysis reports	55	21	24	
– skills inventory and analysis reports	73	15	12	
– merit award identification reports	78	8	14	
– promotion potential reports	79	16	5	28%
– managerial potential identification reports	83	12	5	
– training needs identification reports	85	11	4	
– labour grievance analysis reports	95	4	1	
– Other				
Planning systems				
– manpower planning models	75	19	6	
– compensation planning models	81	12	7	
– career path planning models	88	12	0	17%
– organization charting models	86	9	5	
– succession planning models	85	13	2	
– Other				

Desired future computerization in the field of personnel management

The same application areas from Table 3 were used. The results measure the intensity and direction that future computerization in personnel management should follow.

(i) In the *administrative* field, the clear preference is for augmenting the employee data base with firstly, job performance data, and secondly, qualifications-related data.

The majority of respondents, however, do not yet feel the need to capture labour relations data on the computer.

(ii) *Reporting* systems derived from the augmented data bases mentioned above (i.e. job performance data and qualifications data) are most desired by the respondents. Such desired reporting systems include *skills inventory* reports, *promotion potential* reports, *training needs identification* reports, *labour turnover analysis* reports, and *managerial potential identification* reports.

On the whole, the desire for manpower planning-related reporting systems, is greater than the desire for compensation planning-related reports.

(iii) The demand for a number of *planning and modelling* systems is consistently high. At least half of all respondents who currently have no specified computer-based planning system in personnel management would like to introduce it into their organizations.

The greatest need is for compensation planning models and manpower planning models.

The trends for future computerization in personnel management is clear. The first step is to enhance the existing employee data bases with job performance- and qualifications-related data. Such data provides the basis for expanding reporting systems in the areas of compensation planning and manpower planning. Because reporting systems are primarily historically orientated, the need for modelling capabilities in planning systems has been clearly expressed.

Therefore, although respondent organizations still see themselves as administratively orientated, they recognize the need to increase their emphasis on planning as shown by the expressed desire for greater computer-based reporting and planning systems.

Perceived benefits from computerization of the personnel function

Although it is not always possible to measure in strict economic terms the benefits obtained from the use of computers in personnel management, it is possible to gauge the value of using computers from the perceptions of the persons involved. Consequently respondents were requested to express their own views on possible benefits.

The perceived benefits can be divided into two categories, namely *operational* benefits and *management* benefits. The

former includes the more easily observable and measurable benefits such as *clerical savings*, *smoother administration*, *improved timeliness of reports*, and *more accurate information*.

Management benefits are less tangible and more difficult to measure. These include *better control over personnel activities*, *improved planning in personnel activities*, *easier decision-making*, and *more time for managerial and planning activities*.

Without exception, the operational benefits were highlighted by more respondents than the management benefits. This is indicative of the level of computerization that currently exists in personnel management. The majority of computer applications in personnel management are currently at the administrative level where operational benefits are most obvious. At the management level, the use of computers in decision support — such as reporting systems and more importantly, planning and modelling systems — is at a relatively low level. Consequently, the perceived benefits to management have yet to be realized.

Concluding remarks regarding the application of computers in personnel management in South Africa

Collectively then, the practice of personnel management in South Africa seems to be characterized by the use of computers mainly to replace a number of administrative chores. The development of computer-based information systems to support personnel decision-making at the tactical level is less well-developed (as shown by the moderate use of reporting systems) and are almost non-existent at the strategic management level which would depend more on the information generated from planning and modelling systems which evaluate alternative scenarios. These findings concur with those of Klatt, *et al.* (1985: 637).

However, the need to move towards greater emphasis on planning and management of human resources is recognized and the desire for decision aids to support this process has been strongly expressed.

Conclusion

The literature review at the beginning of this article presented arguments identifying the personnel function as generally lacking in professionalism and calling for greater familiarity with, and involvement in the use of, quantitative tools which enhance the quality of decision-making.

These descriptive assertions were empirically examined through a survey of personnel practitioners in South African organizations.

The findings of the survey overwhelmingly support the assertions. The role of computers in most personnel departments is relegated to performing the traditional data processing activities associated with administration. Reporting systems for management are only partially developed, whilst planning systems are virtually non-existent.

Consequently, the support that management, and in particular top management, receive from the computer in terms of information generation for improved decision-making is largely lacking. Such lack of support has the potential to manifest itself in terms of decisions which are ill-conceived,

thus contributing to the non-professionalism image that is currently attached to the personnel function.

However, in a positive vein, the section on personnel systems indicates the recent emergence of computer-based decision aids which to a lesser or greater extent can begin to meet the needs of personnel managers as identified in the study. The problem that remains is one of education of the personnel practitioners to familiarize themselves with the new technology and integrate it into their decision-making functions. Certain academic institutions in South Africa have identified this need and are beginning to offer programmes: both short courses (Wits Business School), and long-term programmes (Stellenbosch Manpower MBA) and Business Science (UCT) in personnel to augment the traditional personnel curricula with current technological decision aids.

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