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# The role of human resource management in information systems development

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## Abstract

**Purpose** – The purpose of this paper is to examine the inherent weaknesses in the approaches that most organizations use to develop and implement information systems. It examines the role of human resource management practices in information system development.

**Design/methodology/approach** – The paper reports a case study of IS implementation in a major public sector organization. It draws on data from multiple sources.

**Findings** – The research finds that IS failure is often associated with a lack of attention to “softer” management practices such as culture change, organization development and user involvement. The findings of the case study research suggest that HR has a key but neglected potential role to play in successful IS implementation, particularly in relation to the change management process.

**Originality/value** – There is a research gap in the literature on the role of HR in information systems development.

**Keywords** Information systems, Human resource management, Integration, Change management

**Paper type** Research paper

For nearly 50 years the development of information systems (IS) was almost entirely perceived as a technical discipline. IS professionals, with a certain level of help from users, set about developing IS in the various functional areas of firms. They were supported by IS development and project management methodologies, as well as a range of other tools and techniques. A large number of high-profile system development failures put the technical focus of the discipline at the centre of discussion.

It is only recently that the “softer” aspects of the IS development process have achieved a higher profile. For instance, it could be argued that from changing one line of computer code to the implementation of an integrated, organization-wide IS is primarily about the management of change. However, competence in the area of change management is not guaranteed within the skill portfolio of IS professionals. Competence in organisation development may be required to ensure that a new IS provides an organization with long-term benefits, especially through re-skilling and a coherent training programme for staff. Most firms are looking for efficiency and effectiveness gains from the introduction of IS.

The very fact that increasing numbers of IS are company-wide means that the repercussions from their implementation are becoming more far-reaching. IS now require more co-operation and communication across departmental boundaries. It



follows that project leaders should have communication and people skills, as well as project management expertise. There may be a strong correlation between those competences inherent in the HRM function and those required to ensure that an IS implementation is successful in an organizational context.

A considerable amount of disruption can occur when an IS is introduced. There is a possibility that the IS may also be dysfunctional to the organization for several years after the system has gone “live” – by this time, given the levels of churn in the occupation, the technical staff may have moved on to another project. For many organizations, the implementation of a new IS may be the biggest capital expenditure they undertake. If substantial amounts of capital are committed to these developments it follows that every effort is needed to ensure that they are successful for the overall well being of the organization.

This article puts forward two propositions:

- (1) there are inherent weaknesses in the approaches that most organisations use to develop and implement information systems; and
- (2) human resource management staff can provide a valuable contribution to the overall information system development process.

We argue that despite large literatures on both HRM (see Kaufman, 2002; Wheeler *et al.*, 2004) and IS (Mukherji, 2002) rarely are these research fields integrated. This paper seeks to address this gap in the HRM/IS literature.

The focus of the article is a case study involving the evaluation of a system that was rolled out nationally. The system was implemented to try and improve the overall effectiveness of the organisation. However, a number of circumstances led to the failure of the system and these are analysed. We argue that knowledge of HR and change management issues could have reduced some of the key friction points in the IS failure.

The article starts by briefly reviewing the research that has sought to identify some of the complexity surrounding the IS development process, and in so doing we question the overly technical focus of this body of work. Issues of an organisational, cultural, behavioural, and change management nature are introduced. We suggest that these could be seen as areas in which the human resource management discipline has a major stake. We then report the methodology and findings from a study of the adoption of a major IS initiative. Lastly we conclude by highlighting the implications of closer HRM involvement in the development of IS and suggests some possible areas for further research.

## HR and IS

The vast majority of research on the HR and IS link has centred on the role of information systems (IS) in human resource management rather than, and our focus in this paper, on what role HRM can play in the development of IS (Gallagher, 1991; Gray and Kinealy, 1996; Analoui, 1998; Ball, 2001). In this section we identify some of the potential reasons why IS development can benefit from HR input.

The development of information systems (IS) has for many years been regarded as the domain of the technical expert. In what appears to be a growing number of instances, IS appear to be having negative effects on the organisation. A regular spate of system failures may have identified serious flaws in the system development process. Organisations may often be significantly affected by the implementation of IS.

Future IS development may increasingly be trans-organisational and therefore increase the potential for dysfunctionality as complexity increases.

It is difficult to project manage IS developments within the organization, and this increases the number of stakeholders in the process and inevitably increases the chances of goals not being realized. Even changing one line of code may have repercussions within a department/organisation. The development of information systems is a complex process, one with many opportunities for things to go wrong. To try and control this complex process a methodology is required that will bring more discipline to the IS development process. There is usually more demand for new information systems than the potential to deliver them and so there is a need to make more efficient use of the scarce technical resources that are available (Sprague and McNurlin, 1993) and HR skills can help in resource planning here.

Historically, IS have been developed using the system development life cycle (SDLC). This has been the prevailing methodology for medium and large system projects, however, the use of accepted methodologies for IS development have not guaranteed the successful implementation of information systems (Laudon and Laudon, 2005). In many cases IS development is being undertaken by groups who have no experience, or interest, in key areas of business strategy and organizational development and this has implications for the success of the IS (Brooke and Maguire, 1998). IS are often being driven only by technical goals. In many cases the end point of the involvement for the technical team is the day the new information system goes "live". Yet, in many cases this is where the problems start for the organisation.

### **Eclectic or technical IS?**

A number of writers have suggested that the discipline of IS should be eclectic in nature rather than purely technical. The following section tries to identify the wider set of issues that may need to be addressed before we can be confident of implementing effective IS and the potential role for HR in these.

In a hyper-competitive and fast changing environment it is argued that firms appear to be relying ever more on information systems/technology (IS/IT) to help them meet these challenges. Thus new IS must at the very least reflect their information requirements for better decision-making and be supportive rather than dysfunctional for the organisation. The new information system should be able to be integrated within the organisation's culture as well as supporting their working practices. If the IS does not meet these requirements the organisation may end up with a technical success but an organisational failure. IS should not be used only to reinforce the *status quo* within the organisation but ideally be able to question what the organisation is actually doing (Boland, 1979).

An IS may not be able to predict that your firm will soon be going out of business. If, however, more users are involved in the design and development of the company's information systems they should be able to identify the key components of the new IS that will benefit the organisation. If an IS fails to improve the firm's decision-making effectiveness (Kriebel and Moore, 1982) then at the very least it requires updating, but more than likely it should be replaced. It is interesting to note that few organisations decide to take this course of action.

The process of IS development is generally dependent on disparate groups, IS staff, users, management, vendors, and project teams, working together towards a common

goal. Historically, these groups have not always been able to work together constructively (Maguire and Hammond, 1988; Lucas, 1994). In some cases these groups may only work on one project during their working lives. Stages of the process may be inefficient because of the circumstances of the development, i.e. interviewing a user who may be under threat of redundancy (because of the new system) to elicit key information is a complex process. Being able to draw on the organization development skills of an HR function, we suggest, would be valuable in this respect.

The systems analyst/consultant may not know enough about the user area to be able to formulate and ask the relevant questions. The problem may be greater if the interviewer is from outside the organisation and does not take into account behavioural and cultural issues. Conversely, the may not be aware of range of technical issues that may concern the analyst/consultant. This may be important if the new system requires a particular technical infrastructure that the user is unable to envision.

Why do so many organisations allow so-called “experts” to change their organisations when their area of expertise may be limited? These experts may have technical expertise but the introduction of IS/IT requires coverage across many other specialist areas already mentioned above, i.e. communications, organisation development, change management, training and education (Brooke and Maguire, 1998). The influence of these other areas may depend on the type of application that is being developed. One would imagine that a process control application in the chemical industry would not require these specialist areas as much as the implementation of an integrated system into a public sector organisation that has not previously used IT. In either case HR has something to offer in helping the smoother introduction of IS.

In general the literature shows a heavy bias towards technical issues in IS development. However, there are a number of writers who attempt to take a more holistic approach towards IS development process. Checkland and Scholes (1999) refer to these writers as “an important minority strand”, who are able to view the information system development process from a different perspective. Hirschheim and Klein (1994) believe that we should concentrate on the concept and importance of emancipation in the information system development process. They state that this can be done through reviewing previous “hard” methodologies. They focus on ETHICS (Mumford, 1983) as a prime candidate for a methodology that could be extended or “reformulated” to provide emancipation in the system development process.

It is sometimes difficult to strike a balance between the vision of top management, the technology, and the needs of the workforce (Mumford and Beekman, 1994). Lucas (1994) puts forward the view that effective information systems can be implemented if users, management, and IS staff work as a team during the system development process. The usual methods applied to information systems development are interest-based in nature. They tend to be formalised and mechanistic and ignore the wider social and organisational issues involved. This often results in dysfunctional outcomes that have negative consequences for those staff using the new systems and their organisations (Brooke and Maguire, 1998). This section has identified the dichotomy in the information systems area. On the one hand it is seen as a technical discipline; on the other it is seen as being eclectic covering a range of behavioural, cultural, economic, social, and political issues (Maguire, 2000).

**IS and culture change**

The requirement for a change in culture may result in a range of issues surrounding the management of change. Further research is required to make sense of the complex processes that take place when information systems are being developed (Nissen, 1985; Brooke and Maguire, 1998). It is important that the groups involved in system development understand the potential IS have for disrupting the organisation. A new information system may affect the business structure of the organisation (Venkatraman, 1994).

Is it the role of the system developer, and those other staff involved in the project, to view the organisation as a social, as well as an information processing, system (Andersen, 1985). When basic administrative systems were being developed it was often just a case of computerising a well-documented manual system. However, where systems require a forecasting element, encompass unknown elements, or require some envisioning of the future, the information requirements analysis may become increasingly complex. This can be likened to moving upwards from operational control, through management control, to strategic planning in Anthony's (1965) model. Transaction processing systems, i.e. sales order processing, that many organisations have adopted, correspond to the operational control level.

Argyris and Schon (1992) viewed modern organisations as being characterised by management that employ a theory of action emphasising top-down, hierarchically structured control mechanisms. This emphasized management domination and worker subordination. It could be argued that the role of the systems analyst may sometimes be seen as a reinforcement of this view. It would be unfortunate if the whole system development process is undertaken in a conservative way as there is often the need to question the *status quo*. It is argued that the only real successes in business process reengineering (BPR) have been revolutionary rather than evolutionary. With the possibilities for developing information systems across organisational boundaries there may be an increasing need to incorporate a more creative and visionary approach to the whole process. Within manufacturing during the 1980s it was generally accepted that the implementation of new IT would automatically lead to increased productivity. However, there are also many issues surrounding the area of technology transfer.

Several writers have identified the need to view organisational, cultural, and behavioural issues as key areas that need to be addressed for the successful implementation of information systems (Bariff and Ginsberg, 1981, Klein and Lyytinen, 1985). As Keen (1980), pointed out the field has been driven by changes in technology, rather than by issues of management, information and systems that are independent of specific technologies. It may be necessary to broaden out the scope of system development and involve other groups of staff within the process. Strassman (1990) argues that information systems management should be an inseparable element of every manager's daily work. The goal of these groups should be the development of information systems that enable the organisation to function effectively both internally and externally. Technology should not be the overriding focus within the organisation. It is important that a balance is achieved to take account of the issues that need to be incorporated in the development process, i.e. strategy, technology, education and training, etc. HR is often see as the guardian of the organizations culture and could help in the alignment of IS development and culture management.

Boynton and Zmud's (1987) review of IS development concluded that not enough attention has been given to the following issues in relation to IS/IT development:

- analysing the internal culture;
- addressing politics and the distribution of power;
- determining the capabilities to accept, use, and institutionalise IT;
- evaluating IT risks;
- making sure that key members of the organisation take part in the planning effort;
- identifying and communicating the organisational role of IT; and
- identifying and responding to crucial organisational events identifying the planning participants' "assumptions".

HRM staff could play a positive role in nearly all the highlighted areas. Most of the above areas could be grouped under the heading "managing change". This is certainly not a technical discipline. A group of staff is required that can take the firm and its employees from their current situation to a future position that is beneficial and sustainable for all concerned.

### **The case study**

The organization used for the case study is a public limited company wholly owned by the government, with annual sales in excess of £8bn and more than 200,000 employees. Their marketplace is changing rapidly and they are attempting to provide literally hundreds of services to meet new demands – from electronic billing to banking, and from warehousing to customer returns. They are currently attempting to reinvent their business to meet the changing requirements of their customers and the demands of competition. Their corporate goal is to be the world's leading purveyor of their core business. Currently, they have exceeded nine of their 15 target levels.

### **Research process**

Several groups of staff were interviewed in the review of this implementation. Twelve staff at Head Office were interviewed. It was agreed that these interviews would be of approximately 30 minutes' duration. It was agreed that wherever possible an internal auditor would sit in on the interviews. Staff at nine of the Sales Centres were also interviewed. Usually between two and three employees were interviewed at each Centre. The suppliers of the system were also interviewed at their Head Office in Cheshire. The interviews were carried out over a six-week period. It was also agreed that the clients would make the new system available for review over a two-day period. Detailed field notes of the interviews were recorded and content analysed using selective coding.

It was important to evaluate whether the original aims of the project had been met. There were a number of technical issues that had to be analysed. Did the new system lead to a degraded service for either the customers or the users? Did the new system actually support multiple applications? What effect does running multiple applications have on the effectiveness of the system? Are there any general problems with regard to capacity planning? However, it was important that the evaluation investigated a



number of key areas such as training, education, the change process and alignment with business strategy. It would be futile if the new system met certain technical criteria but failed to deliver customer, user, and business benefits.

### Findings

In common with many recent system developments, this implementation involved replacing what was considered as an outdated computer system with a new computer system. The new design needed to be a transaction-oriented system that supports many users and is able to:

- build and manage queues; and
- manage complex business transactions.

Basically, the new system would allow customers to book slots within the system, i.e. if a pizza outlet wanted to advertise a reduction in prices they could use the system to book the delivery of a mailshot outlining the offer. The effectiveness of this booking was dependent on its timing and the coverage of potential customers. If the timing of the “drop” of leaflets did not coincide with the special offer, the utility of the service declined dramatically. If the target audience was not reached there would be major inefficiencies in the new system.

This project was first authorised because it was anticipated that there would be a 70 per cent growth in business during the first few years of the twenty-first century. The hope was that a system could be developed that would be able to take this business area into the new millennium providing a flexible system for customers and users. It was hoped that this project would ease the pressure on bookings both now and in the future. Data was converted from the old to the new booking system. There was a planned conversion process for the new system although the original plans had been changed. There was a change from the planned “big-bang” approach to a phased changeover from the old to the new system. As with many information system developments, there were many different stakeholders interested in its implementation.

There were several project managers during the life of the project. It was generally believed that this led to a change of focus within the project. It inevitably led to a lack of coherence in relation to meeting the aims of the project and also to a breakdown in communication between the various stakeholders. There was a general feeling from interviews (see Table I) that users had not been involved during the development process.

This was especially true of the design process. One group of staff expressed concern that there were three different sets of technical views being input into the project. Different stakeholders had different expectations about what the system should be able to do. Several staff believed that the development team only had a superficial understanding of the business requirements of the new system. It was also pointed out by some of the interviewees that too much development time had been expended on enhancements to the system rather than its basic requirements.

Some staff suggested that this problem emanated from the original translation of the new user requirements and the documentation that surrounded them. In fact the true performance of the system would be judged against an accurate understanding of user and customer needs. The developers needed to have a clear understanding of what parts of the system could be enhanced by the use of a computer and those that would

Interviewee	Member of project team	Pre-implementation	Going "live"	Post-implementation
Project Manager	Yes	We decided to totally withdraw the old system	I was the third project manager and was never happy with the changeover	In hindsight the "big bang" strategy was a mistake
Supplier (Cheshire)	No	They kept changing the specifications	We did not make the decision on the handover. Promises had been made	It was inevitable with three project managers that problems would arise
User Group Member (1)	Yes	Everyone was asking for bells and whistles	The system couldn't cope with the extra tasks	To be honest I think communications in the project team could have been better
Finance Manager	Yes	It didn't help having three project managers	We were over-ambitious with the number of users	There was no one to hold things together when things started to go wrong
Finance Director	No	The old system would not have coped with the increase in business	From my side we were confident that things would go well	There were too many stakeholders, i.e. suppliers and consultants
User Group Member (2)	Yes	It was felt that our views didn't really count	There was no contingency plan if things went wrong	In reality this was just an IT solution to a company problem
Sales Supervisor	No	We were all happy with the old system	We tried our best to make things work	Head Office told us to make the best of a bad job
Sales Team (Greater Manchester)	No	We were a happy team	I had forgotten what I had learned on my training course – it was 15 months ago!	Better training may have made things better
Sales Team (East Midlands)	No	No one told us of the change issues	I had a bad feeling about that day	Head Office told us to tell our customers to go to our rivals. We were shocked
Sales Team (West Yorkshire)	No	The training course was at the wrong level. I forgot most of it	We knew what we were supposed to do but deep down we knew it was risky	No one would make the decision to pull the plug
Sales Team (East Anglia)	No	No one asked us if we understood anything at the training course	We weren't against the new system but we had our doubts	The failure had knock-on effects elsewhere
IT Team Leader	Yes	Having three project leaders didn't help	It is true that the chosen IT platform was probably unstable	It had been difficult to pilot the new system
Analyst Programmer (1)	No	We felt the system was geared towards Head Office	I think that 60 users was optimistic	We didn't allow enough time for testing
Analyst Programmer (2)	No	The old system was on its last legs	We had tested it with six users ... maybe it gave us a false sense of security	In hindsight parallel running would have been better instead of "big bang".

**Table I.**  
Sample quotes from field notes at critical times in the project



be better left alone. Some staff suggested that it may have been the system design that was at fault rather than the technology. The system did in fact meet the functional requirements but may have failed to deliver in other areas. There was significant concern about the lack of analysis undertaken in the various business areas. The different sales centres had different methods of booking, whereas the new system established a universal system. Certain users suggested that there were many enhancements to the new system without necessarily providing any improvements.

A significant number of sales centre staff believed that the previous computer system was effective. They stated that they felt comfortable with the old system. Some pointed out that the old system could have been made more user-friendly. Most sales staff believed that they hadn't been consulted about the merits of the previous system. It was relatively old but it worked. With a reasonable amount of training the new system would be easy to use. The standardisation of Microsoft menus and screens allowed users with this experience to grasp the main functions of the system.

Several staff viewed the project management as being incremental rather than planned. This may have explained some of the deviations away from the original specification. The project appears to have suffered from the classic project management problems, e.g. changes in personnel that would lead to the loss of continuity. One interviewee summed up the new project as having problems because it was "date-driven, finance constrained, and lacking in user empathy". There was not even agreement over the choice of IT. One member of staff thought that there was an identity crisis with the system in the very early stages. Was it a customer-oriented system, an operational system, or both?

There was a limited amount of user involvement at various stages of the development, but feedback suggested that this was of a passive nature. The user group to support this project met bi-monthly but could not feed back into the system development process. In fact one member of the development team stated that he never had the opportunity to interview users. There were a number of issues raised in relation to hardware and software. These are important areas, but were outside the remit of the user group. The organisation used a traditional system development methodology.

Table I reveals comments from the interviewees at important times in the project process, namely, pre-implementation, going "live", and post-implementation. It provides deeper insight into what the key stakeholders were thinking at key stages of the project process. It can be seen from Table I that certain staff groups were not represented on the project team at all. There appears to be a general feeling that the organisation had underestimated the change aspects of this project. With such a large project there was a need for stability. Having three project managers did not aid the overall implementation process. The size of the change probably required the project managers to have extra competence in team-building and political leadership. It is usually more difficult to introduce change when many staff are happy with the *status quo*. It is difficult for the project manager to appear neutral when change appears to be imposed on groups of staff without their overall consent.

A consensus was needed for the changeover process. Key employees were not given an adequate level of training at key times in the project. It was important to maintain good communications at these important stages of the overall process. It was certainly necessary to have some form of contingency plan. There was no risk management

strategy attached to the project plan. There appear to be too many disparate groups with different aims and objectives. There was a definite need to ensure different functional areas worked together as a team during critical stages of the project. Some key stakeholders were not represented in the project team. Competence in organisation development may have greatly helped the project.

### Conclusions and discussion

It was apparent from an early stage of the evaluation process that senior members of the project team only wanted the system evaluated in terms of its adherence to technical specifications. This deflected some of the attention away from the fact that several of the interviewees described the implementation of the system as a disaster. It could be argued that if there are inherent weaknesses in the approaches used to develop and implement information systems then there may be major issues in the way these systems are evaluated and reviewed. If the conventional wisdom at the start of a project that the IS development is predominantly of a technical nature then the measures of success are also likely to be of that ilk.

Generally, the three main measures of success in any project are:

- (1) keeping costs within budget;
- (2) delivering at the agreed time; and
- (3) meeting predetermined quality targets.

It is sometimes difficult to identify the repercussions of an implemented information system. The above three measures are not separate and generally when a project goes over the allotted time it also goes over budget. It may be a good idea to introduce other measures into the equation. Did users use the system? Did your customers find that the new system gave them a better service? Did the new system lead to more job satisfaction? Did staff turnover decrease? Did staff have positive perceptions of information systems in general?

The staff were happy with the original system as they had grown up with it and were using it on a day-by-day basis. They knew of its idiosyncrasies. Even their customers understood its shortcomings. However, it was flexible. When customers used it they knew what it was capable of. The service they received was understood and they did not require any additional training. There appeared to be a behavioural issue that the staff felt no empathy towards the new system. Their affiliations were with the previous system. They felt that the overall project management process had not been handled well and they felt alienated.

There may be an argument to have a group of staff, outside the formal project team, who will monitor the progress and potential success of the system development. These staff will try and identify the success or otherwise of the training and education that is undertaken as part of the system development process. This will probably be more effective if the views of individual members of staff are anonymous. The vast majority of evaluations are by their very nature retrospective and this can have major business and financial repercussions for organizations. This may also act as a further control on the development process and also provide an early warning system for potential problems with the project.

It seems logical to view HRM staff as being in a good position to be more deeply involved in IS development. They may be perceived as being neutral in the overall

process. If this group is given the requisite influence and resources they may be able to ensure that when a new information system is implemented, it will be relevant to the information needs of the organization; the organisation will be receptive to the new information system – those staff who will be using/interfacing with the new system will have an acceptable level of competence to be able to cope with the new situation; all staff will be aware of the changes to working practices that the new system will create; staff experienced in change management will be utilized to ensure a smooth changeover from the previous to the new system; and where resistance to change is encountered it should be handled in a sympathetic way.

Another benefit of using HR staff in this way is that they will be around when the system has been implemented. Increasing numbers of organizations are outsourcing their IS and IT requirements. Other organizations are using outside consultants and vendors for their system requirements. Many organizations would prefer to have these resources in-house. However, if a group of staff have been involved in the system development process at an early stage and have been close to the overall process it may make the years after implementation less painful. That group could have a key role for HRM staff.

Lastly, although we argue for a greater role for HR in IS development and our case study findings support this, we also suggest that some caution may be in order. There is considerable evidence that where HR is more deeply involved in IS development and technical change generally then more positive outcomes emerge (Clark, 1993). However HR is not a “silver bullet”; the mere involvement or presence of HR in IS development teams is not a guarantee of success and the literature also reports examples of IS failure with HR involvement. There is some indication that IS/IT or HR resources on their own are insufficient for sustained firm competitive advantage (Powell and Dent-Micalleff, 1997) and we need to know more about the interaction between the two. We suggest a fruitful line of research could investigate this relationship in more depth.

Equally, it is not necessary that the key people management skills and competences need to be located in the HR function. There is some considerable evidence that this function too has been subject to the outsourcing, most recently through shared service centres, and there are increasing doubts about the level of skills resident in HR departments to perform the high-level interventions needed by major IS development. It might not be necessary or possible for the specialist HR manager to be champion of the organization development, culture change and training issues that IS development throws up. What we argue above, and find from our case study, is that someone needs to address this issue. If not the HR function, then an interesting line of research could examine who will take on this role in the future.

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