A STRATEGIC EMPLOYEE RESOURCING FRAMEWORK (SERF) FOR CONSTRUCTION

Ani B. Raiden[1], A.R.J. Dainty[1], and R.H. Neale

[1]*Dept of Civil and Building Engineering, Loughborough University, Loughborough, LE11 3TU, UK*
[2]*School of Technology, University of Glamorgan, Pontypridd, CF37 1DL, UK*

The characteristics of the construction industry require contractors to set up temporary organizational structures at dispersed geographical locations, within which unique projects are managed. Thus, the project team forms the basic unit of working life in construction. Despite this, surprisingly little attention has been paid to managing delegation and empowerment, concepts widely associated with teamwork within other sectors. An EPSRC funded research project set out to begin to address this shortfall by examining the challenges this type of organizational structure poses on managing construction organizations and their workforce and suggesting potential solutions to responding to such challenges. Employee resourcing, and more specifically the team deployment function, was identified as being an immensely challenging management activity. In particular, the short period construction projects have for mobilization, the transient workforce and the temporary nature of construction project teams were found to make planning difficult and thus, decision-making is largely ad-hoc. In response to this, a Strategic Employee Resourcing Framework (SERF) has been developed. The framework combines a fully integrated computerized resourcing tool, a human resource information system (HRIS), user-friendly web interface and a set of procedural guidelines to provide managers and employees alike with easy access to a wide range of information. Together, the SERF should encourage employee involvement and support effective knowledge management within construction organizations. Utilizing such an approach should also result in more transparent communications and organizational procedures, improved job satisfaction, more informed employee resourcing decision-making and thus, improved organizational performance.

Keywords: employee resourcing, employee involvement, human resource information systems (HRISs), teams

INTRODUCTION

Construction projects require construction firms to set up temporary organizational structures at dispersed geographical locations, frequently at a distance from central management. The project team forms the focus of working life in construction, operating with a significant and necessary degree of independence. Delegation and empowerment are therefore essential aspects of the management of construction work. Clearly the characteristics of staff allocated to project teams also has a crucial effect. Nevertheless, currently this allocation tends to be somewhat ad hoc and based on the implicit knowledge of the senior managers (Raiden *et al.*, 2002). The skills and knowledge requirements of the project dominate the decision making, at the expense of individual needs and aspirations. Moreover, the time available between contract award and the project start date is usually very short, so unless a system and

---

associated up-to-date data are already in place, the current approach will prevail. This problem is emphasized by the industry's tendency to support the traditional "personnel management" style people management practices rather than the more strategic human resource management (HRM) approach (Druker and White, 1995; Druker *et al.*, 1996). Focus is placed on payroll administration and compliance with legislative and regulatory conditions (ibid.) where central to the concept of strategic HRM lies the argument that the effectiveness of an organization largely depends on the efficient use of human resources. HRM comprises a set of practices designed to maximize organizational integration, employee commitment, flexibility and quality of work (Guest, 1987: 503) by incorporating delegation and empowerment into the decision-making processes. In construction the success of such practices fundamentally depends on the effective management of the employee resourcing function. That is, allocating staff to projects by meeting the competing needs and requirements of the organization, the project and individual employees. This requires the different components of the employee resourcing function (staffing, performance management and human resource administration) to be effectively integrated to form an interconnected network of decision-making and support processes (Taylor, 2002). Modern human resource information systems (HRISs) offer highly sophisticated facilities to assist in this (Greenlaw and Valonis, 1994; Miller, 1998; Raiden *et al.*, 2001, Snowdrop Systems, 2002). However, in construction surprisingly little attention has been paid to managing delegation and empowerment, concepts widely associated with teamwork within other sectors, or introducing tools to aid effective project allocation systems.

An EPSRC funded research project set out to begin to address this shortfall by, firstly, examining the challenges the project-based organizational structure poses on managing construction organizations and their workforce. This was carried out via exploratory and semi-structured interviews and surveys. Secondly, on the basis of a thorough analysis of these data, potential solutions to responding to such challenges were suggested. This culminated in the development of a strategic employee resourcing framework (SERF), which incorporates a HRIS and a set of procedural and policy guidelines both easily accessible via a single user-friendly web interface.

This paper provides a brief overview of the background to the project and the data collection and analysis. The main focus, however, is placed on introducing the developed SERF model.

METHODOLOGY

As alluded to above, the aim of the project was to investigate the challenges that a project-based organizational structure poses on managing construction organizations and their workforce, and suggest potential solutions to responding to these challenges. Hence, within an overall interpretative framework, the project began by identifying the compatibility and conflicts between the competing organizational, project and individual employee needs and requirements. This was established by conducting a set of exploratory and semi-structured interviews with divisional directors (4), HRM staff (4), operational senior managers (7) and employees at all levels (35) of an in-depth case study organization. A single case approach was found appropriate for the first stage of the data collection as this was later complemented by six validation studies (Bryman, 1989; Yin, 1994; Scholz and Tietje, 2002). The interview instruments were developed to explore the issues identified within the wider literature, those which emerged from previous interviews and to collect data on specific projects within

which the respondents had been involved. Thus, as well as identifying the compatibility and conflicts between the competing organizational, project and employee needs, the interview material was used:

- To model the current resourcing decision-making processes

- To extract a list of factors important to be taken into account in the project allocation and team deployment decision-making

- To draw project case studies via which the success of historical resourcing decisions was analysed.

The initial qualitative interview data were supported by a researcher-administered quantitative questionnaire survey. A pair-wise comparison test asked employees to rank the importance of nine factors that potentially influence team deployment decision-making against each other. These were [1] personal and/ or professional development, [2] work location close to home/ maintaining work-life balance, [3] training opportunities, [4] organizational division, [5] experience in working under different procurement systems or contract forms, [6] gaining broad and/ or specialist experience, [7] project type (e.g. size, complexity, etc.), [8] good team relationships, and [9] promotional opportunities. The factors were derived from an extensive literature review. The conclusions drawn from the initial interview and questionnaire data were validated via a postal "factor validation questionnaire" administered to 100 managerial and employee respondents within the initial in-depth case study organization.

The validation case studies conducted external to the in-depth case study served a dual-purpose: [1] to verify the findings drawn from the initial interview data and [2] to collect best practice data on how different organizations manage the employee resourcing activities. The companies selected were similar to the in-dept case study in size, number of employees and turnover. Nine HRM and managerial respondents were interviewed within these organizations.

Additionally, along the initial in-depth case study, an industry wide HRIS survey was conducted. This included a postal questionnaire sent to 100 leading UK contractors (for details see Raiden *et al.*, 2001) and an evaluation of major commercially available HR software packages. Initially, the evaluation included a visit to the CIPD (Chartered Institute of Personnel and Development, UK) Computers in Personnel exhibition (CIPD, 2000) and an extensive web-search of the CIPD and SHRM (Society for Human Resource Management, USA) information resources on HR technology (CIPD, 2001; SHRM, 2001). Systems with capabilities to support the complex project-based employee resourcing activities were identified. This was followed by a more detailed investigation into the facilities these systems provided for managing team deployment activities.

Extensive use of NVivo, a qualitative data analysis software (Bazeley and Richards, 2000), summary statement matrices (Miles and Huberman, 1994), thematic analysis (Boyatzis, 1998), and SPSS and MS Excel, packages for the analysis of quantitative data, were made in analysing these multiple sets of data. NVivo helped to collate them together forming a robust mixed methodology, which was not only focused on collecting data from multiple sources but also facilitated the use of this varied material to cross-reference and complement the arguments/ conclusions drawn (Bazeley and Richards, 2000; Scholz and Tietje, 2002). This type of methodology is often also referred to as triangulation.

RESULTS AND DISCUSSION

Employee resourcing priority pair-wise comparison test
The employee resourcing priority pair-wise comparison test provided some early indications as to the importance of the various factors that need to be considered in the team deployment decision-making. Since the questionnaire was administered within the interviews, a significantly high response rate of 88.6% was achieved. As Figure 1 clearly shows, 'good team relationships' [team] together with 'personal and/ or professional development' [developm] and 'gaining broad and/ or specialist experience' [experience] were ranked as the most important factors to be taken into account. These were closely followed by 'work location close to home/ maintaining work-life balance' [location] and 'promotional opportunities' [promotion]. This indicates strong preference toward the "soft issues". Due to the culture of the organization, which emphasizes departmental loyalty and commitment to local practices and resulted in very little movement between divisions/ departments (Raiden *et al.*, 2002), not surprisingly 'organizational division' [division] received very little importance.

	team	developm	experience	location	promotion	project	procurem	training	division
Series1	195	165	141	129	127	116	107	101	28
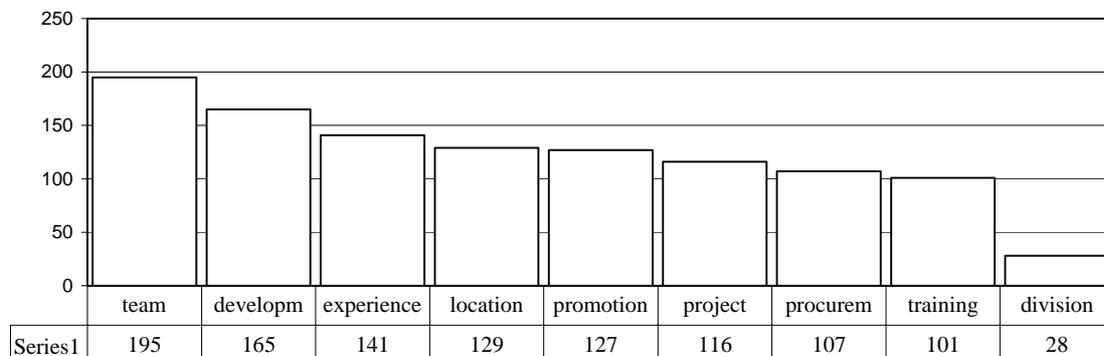
Figure 1: Rank order of the employee resourcing pair-wise comparison test results

Interviews
The qualitative interview material supported the opening findings derived from the pair-wise comparison test. Table 1 summarizes the key factors highlighted as important to be taken into account in the team deployment decision-making by both the employee and managerial respondents. For easier understanding, the factors are grouped into categories and arranged by themes and type of HRM practice, i.e. hard–soft. The "hard" category contains factors that refer to HRM processes/ procedures. The "soft" category includes cultural factors. Moreover, the factors presented in standard typeface, mainly placed toward the harder category, refer to issues that require procedural/ policy support in order to contribute to successful team deployment practice (for example the introduction and careful monitoring of promotion and training policies). The factors highlighted in italics mark variables that necessitate cultural change as well as procedural support. These issues are much more complex and difficult to manage, however of crucial importance to successful resourcing strategy and practice. Organizational culture and communications set the overarching context within which the more specific processes, such as promotion and training, are managed. Thus, for any particular policy to succeed these contextual factors need to be carefully considered and managed in a way that supports the effective implementation of the operational resourcing procedures and policies. Similar issues were raised within the validation case studies.

Table 1: Factors important to be taken into account in resourcing decision-making

THEME	HARD	~ ~ ~	SOFT
Careers	Progression/ Promotion Horizontal moves Role and responsibilities	Career development	
Organization			*Org culture*
Remuneration	Pay		
Employee Involvement (EI)/ communication		*Communication (overall)* *Comprehensive range of info on projects* Feedback on performance/ progress	
Development	Training Graduate development	*Personal (and org.) development*	
Team/ project	Team member selection Team integration and co-ordination New recruit/ team member induction	Best use of skills and talents	*Team spirit*
Individual	*Employee health problems*	*Work-life balance*	
Industry characteristics	*Travel*		

Factor validation questionnaire

The factor validation questionnaire confirmed these findings. Table 2 lists the thirty most important factors specified by the survey respondents as important to be taken into account in the team deployment decision-making process.

Table 2: Factors important to be taken into account in resourcing decision-making

	Employees	*Both*	*Organization (managers)*
1.	Holiday entitlement	**Work-life balance**	Right project manager on a team/ project
2.	Working hours	**Friendly culture**	Legal and regulatory frameworks
3.	Appraisal (conducted effectively)	**Team spirit and integration**	Technical capability and competence
4.	Senior management/ HQ staff interest	**Travel**	Disruptive influenced removed
5.	Expectations discussed (psychological contract)	**Two-way communication**	Effective problem solving
6.	Continuous feedback	**Taking on trainees**	Continuous improvement
7.	Benefit preferences	**Induction programme**	Satisfied workforce
8.	Employee involvement in project allocation	**Career management/ succession planning**	Professional attitude
9.	Personal project preferences	**Clear role and responsibilities**	Continuous workload
10.	Job rotation	**Transparent progression**	Repeat business

The left-hand column lists the responses from employees and the right-hand column those from managers. The middle column highlights factors referred to by both the employees and managers. Recurring themes become evident: organizational culture, team spirit, communication and careers. Noticeably, the survey also highlighted a factor that had previously been paid little attention to: 'holiday entitlement'. The employee respondents indicated concerns in relation to not being able to take their holidays in time (during the specified working year) and thereby loosing their entitlement due to project priorities dominating the team deployment functions.

HRIS survey and evaluation
The findings of the HRIS survey provided an understanding of the team deployment practices in the wider context of the industry by looking at the use of information technology to support the resourcing decision-making within leading construction organizations. The results suggested the use of HRISs in construction being broadly similar to the national average across all sectors. Nevertheless, the utilization of such systems was found extremely limited, remaining restricted to routine administrative tasks (for details see Raiden *et al.*, 2001). In particular, the under-utilization of HRIS technology for managing employee deployment emphasized the need for this research. The outcomes of the evaluation were collated on a summary sheet, which informed the in-depth case study organization's choice to invest in a suitable system. This was identified as being Snowdrop (Snowdrop Systems, 2002) from among two dozen systems, which specifically indicated supporting project-based environments.

The robust methodology developed to derive these findings can be adopted for use elsewhere. This may produce different results as the findings will be contingent on the culture of the organization(s) under investigation. Nevertheless, the methodology provides a useful structure for the study of employee resourcing practices within the construction industry.

On the basis of the findings and good practice approaches extracted from the validation case studies a structured, comprehensive, yet flexible framework was developed to support a more effective, strategic approach to employee resourcing. The emphasis was placed on the *strategic*, as clearly a change in management practice and confidence must be achieved prior to implementation of any specific system or procedure/ policy. The operational model is currently under construction. The model at this stage forms a proof of concept, rather than a fully functional decision-support system.

DEVELOPMENT OF THE STRATEGIC EMPLOYEE RESOURCING FRAMEWORK (SERF)

The SERF includes three main components: a HRIS Snowdrop, procedural/ policy guidelines, and a web-based interface. Figure 2 provides an outline of the model. This broadly represents the layout of the web-based interface and provides pointers to the procedural/ policy guidelines together with links to the HRIS. Each of the elements and their development is discussed below under appropriate sub-headings.

Web-based interface
The web-based interface is a key to easy access to the electronic SERF model. It portrays the five interconnected elements of effective employee resourcing highlighting the links between the different functions. Interactive buttons present these five resourcing functions:

- Team deployment

- Human resource planning

- Performance/ career management

- Employee involvement

- Training and development.
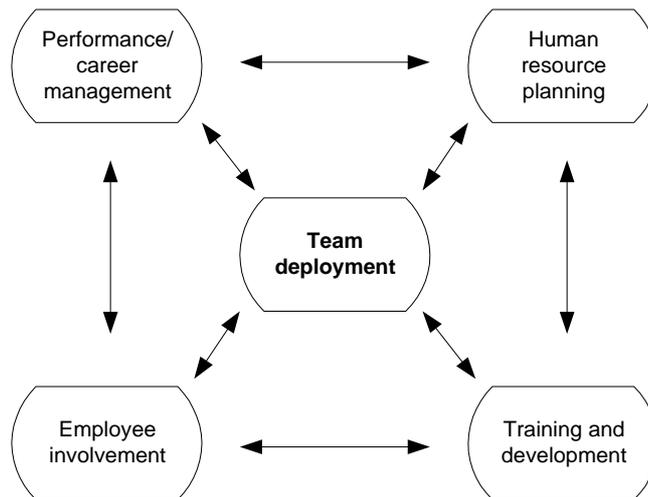
Figure 2: The strategic employee resourcing framework (SERF)

When hovered over with the cursor each button triggers a box with an overview to the function to appear. Detailed menu and information can be accessed via a single click of the mouse, which then takes the user to the next level down the model. This displays a summary information table with links to further details. Process charts open up new windows to allow for full viewing, and include links to any relevant documentation as well as back to the main page. The relevant documents are available for download or printing. Alternatively these can be filled in on-line.

Procedural/ policy guidelines
The procedural/ policy guidelines focus on guiding managers and employees through the five interconnected employee resourcing functions. Although the functions are separated into distinctive sections within the model, the "full loop" linking provides access to all relevant parts of the model from any given point. For example, from team deployment the user can move to view information on recruitment and selection (located under human resource planning) via a single-click link. Each process flowchart opens up a new window with links to relevant documentation and any other related processes, as alluded to above. Contact details of personnel responsible for administering each particular task are provided should further assistance be required. Also, relevant training courses are listed and links to applications forms and procedures included.

A gap analysis of the models drawn to represent the in-depth case study organization's current practice informed the specific procedural/ policy requirements of the model. Much of the good practice information was derived from the validation case studies

and backed up by literature. Each of the six companies demonstrated exemplary people management practices in some areas of employee resourcing, however none was found to manage the function in a fully integrated manner. Thus, a number of initiatives were joined together to form an interconnected network of decision-making and support processes, as suggested by Taylor (2002).

The human resource information system (HRIS)
The HRIS element focuses on the collection and recording, storage, management, delivery, presentation and manipulation of human resources data (Broderick and Boudreau, 1992: 17). Snowdrop facilitates this via a range of components each specifically designed to serve the diverse needs of the different employee resourcing functions. FOUNTAIN*executive* supports the human resource planning, team deployment and performance/ career management activities. This is achieved via fields that help administer job profiling, competency analysis, employee appraisals and performance assessment, analysis of key performance indicators, succession and career planning, monitoring and evaluation of business objectives underpinning organizational development, and project planning. Thus, it provides a flexible, multi-level framework for analysing the current and future skill and competency requirements vs potential supply, and a structure for HR planning. SPRING is Snowdrop's recruitment and selection facility. In particular, it helps with vacancy and applicant profiling, applicant search by multiple criteria, monitoring of key vacancy milestones, and interview administration. The benefits of using SPRING to assist in the recruitment and selection of potential candidates can ensure efficient, timely correspondence throughout the entire recruitment process, controlling and managing recruitment budgets, and automating processes across the organization. EVERGREEN is the system's record database, which holds all the human resources and related information on the company employees. U-ACCESS provides the employees with 'self-service' functionality. Employees and managers are empowered to access, analyse and interact with live information about themselves and their teams. The module is bound to improve data accuracy: responsibility for correctly entering and up-dating basic details lies with those who have direct interest in the data – the employees themselves. This should improve company-wide communication and generate operational cost savings. FOUNTAIN serves the training and development function. It includes facilities for course and event administration and evaluation, resource booking, training history up-dates, appraisals, managing training budgets, and recording CPD (Continuous Professional Development). Via effective management of employee development FOUNTAIN can help to improve staff retention and ensure maximum benefit is received from training/ development activities by both the organization and its employees. Figure 2 references the relevant components of Snowdrop to the corresponding resourcing functions.

Once fully operational, the different components of Snowdrop can be accessed directly through the web-based interface. Buttons next to each of the resourcing functions will direct the user straight to the relevant fields in FOUNTAIN*executive*, SPRING, EVERGREEN, U-ACCESS and FOUNTAIN.

Resourcing handbook
The electronic version of the model is supplemented by a paper-based resourcing handbook. This provides access to the essential resourcing information to those with no access to a computer or the web and caters for those with lesser confidence with computers. In addition, it can be used as part of a new employee induction pack to

offer comprehensive introduction to the company policies and procedures, and in so doing initiating early commitment. Posters that accompany the manual can be placed on walls in offices, site cabins and break areas. These include brief tick-box checklists for quick reference on each of the five main areas of SERF.

Together, the different components of the SERF (the web-interface, procedure/ policy guidelines, HRIS and the resourcing handbook) form a central information source on employee resourcing. The SERF introduces flexibility to serve the needs of individual employees, as well as the organization and projects it manages, via integrating employee involvement, delegation and empowerment firmly into the decision-making processes. This supports the strategic HRM approach to people management. Potential benefits include enhanced staff morale, motivation, performance and commitment; effective knowledge management via transparent communications and organizational procedures; more informed employee resourcing decision-making and thus, improved quality of work and organizational performance.

Further work on the model is under way. This continues on the development of the operational functionality. Longer-term, the aim is to design a set of generally applicable guidelines to employee resourcing that construction and other project-based firms could adapt to suit their individual organizational structures and operating strategies.

CONCLUSIONS

The characteristics of the construction industry set a complex and challenging context for effective employee resourcing. The geographically dispersed project-based nature of the work, the short timescales within which the projects are won at and the industry's tendency to support personnel management type people management practices result in ad hoc team deployment. HRM style management practices coupled with sophisticated HRIS applications that have been found to offer a more strategic solution within other sectors have attracted little attention. The SERF research project set out to begin to address this shortfall. The outcomes of an extensive investigation into the current practices within the industry culminated in the development of a SERF model. This model embraces the basic elements of HRM, organizational integration, employee commitment, flexibility and quality of work, by incorporating delegation and empowerment into the employee resourcing decision-making. Currently the model presents a 'proof of concept' study. The strategic, higher level outline provides a structure for integrating the various elements of employee resourcing. The development of a fully functional, operational system is under way.

REFERENCES

Bazeley, P and Richards, L (2000) *The NVivo® Qualitative Project Book*. London: SAGE

Boyatzis, R E (1998) *Transforming Qualitative Information: Thematic Analysis and Code Development.* Thousand Oaks, CA: SAGE

Broderick, R and Boudreau, J (1992) Human resource management, information technology and the competitive edge. *Academy of Management Executive*, **6**(2), 7-17

Bryman, A (1989) *Research methods and organization studies*. London: Routledge

CIPD (2000) Users' views on computerized HR systems. *Chartered Institute of Personnel and Development and Institute for Employment Studies Computers in Personnel 2000 Show Guide*. London: People Management

CIPD (2001) Software source. *Chartered Institute of Personnel and Development guide to HR software.* http://www.softwaresource.co.uk/ London: People Management

Druker, J and White, G (1995) Misunderstood and undervalued? Personnel management in construction. *Human Resource Management Journal*, **5**(3), 77-91

Druker, J, White, G, Hegewisch, A and Mayne, L (1996) Between hard and soft HRM: human resource management in the construction industry. *Construction Management and Economics*, **14**, 405-416

Greenlaw, P and Valonis, W (1994) Applications of expert systems in human resource management. *Human Resource Planning*, **17**(1), 27

Guest, D (1987) Human resource management and industrial relations. *Journal of Management Studies*, **24**(5), 503-521

Miles, M B and Huberman, A M (1994) *Qualitative Data Analysis*. 2nd ed. Thousand Oaks, CA: SAGE

Miller, M (1998) Great expectations: is your HRIS meeting them? *HR Focus*, **75**(4), 1-4

Raiden, A B, Dainty, A R J and Neale R H (2001) Human resource information systems in construction: are their capabilities fully exploited? *In:* Akintoye, A (Ed.), *17th Annual ARCOM Conference*, 5-7 September 2001, University of Salford. Association of Researchers in Construction Management, Vol. 1, 133-142

Raiden, A B, Dainty A R J and Neale R H (2002) Employee resourcing for a medium-large UK contractor. *In:* Uwakweh, B and Minkarah, I (Eds.), *10th International Symposium of the CIB W65 Commission on Organization and Management of Construction*, 9-13 September, University of Cincinnati. CRC Press, Vol. 2, 1429-1445

Scholz, R W and Tietje, O (2002) *Embedded Case Study Methods: Integrating Qualitative and Quantitative Knowledge.* Thousand Oaks, CA: SAGE

SHRM (2001) *Society for Human Resource Management buyers' guide on Human Resource Information Systems*. http://www.shrm.org/buyers/ Alexandria, VI: SHRM

Snowdrop Systems (2002) http://www.snowdrop.co.uk/

Taylor, S (2002) *People resourcing*. 2nd ed. London: CIPD

Yin, R K (1994) *Case study research: design and methods*. 2nd ed. London: Sage.