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The management of human resources in project management-led organizations

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Abstract

Purpose – The paper examines the operational impact of project management systems on the management of human resources and the practical implications of this for practitioners in two project-led engineering contractors

Design/methodology/approach – The paper achieves these objectives through semi-structured interviews in two in-depth case studies.

Findings – The paper examines specific human resource practices, for example, staff appraisal and efforts at work re-structuring. The paper finds that in project-led organizations, such as those in engineering contracting, embedded sectoral characteristics such as portfolio training limit the capacity of HR practitioners to actively change employee perceptions of their development.

Research limitations/implications – The paper reports on sector-specific research. However, the paper does illustrate the lack of engagement between project management literatures and personnel/HR literatures on the role of HR practitioners in project-led organizations

Practical implications – The paper draws out the impact of embedded sector effects on the management of HRs and the effects of this on the role played by practitioners.

Originality/value – The value of this paper for the academic community is that it emphasizes a lack of engagement between project management literatures and HR/personnel literatures when it is likely that “project management” systems are a core managerial mechanism for the deployment of staff.

Keywords Project management, Human resource management, Organizational structures

Paper type Research paper

Introduction

For some project management is a core mechanism for the organization and deployment of human resources in most private sector organizations and is particularly so in multinational firms and service providers (McGovern, 1998, pp. 63-8). Here customer-specific trading units coordinate and organize the work of employees to provide operational transparency and accountability creating systems with built-in operational targets. Beyond the private sector project management is increasingly prevalent in the public and voluntary sectors where charities, hospitals, schools and universities are run on project-focused principles (see Maylor, 2002; Scase, 2001). Thus, the research question that this paper addresses focuses on the operational impact of project management in engineering services and the practical implications of this for those involved in the management of human resources. The paper divides into three parts. Part one provides a broad definition of project management and its relevance to

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HR practitioners. Part two provides a brief summary of project management in engineering services and part three evaluates how two project management specialists, Engserv and Exbeck in this sector sought to involve the human resource function within the project management process.

1. Project management and human resources

This part of the paper provides a broad definition of project management, assesses its relevance to HR practitioners and how it differs from other approaches to coordination and control. Project management refers to the creation of a group of individual specialists from different parts of the organization that are brought together for a limited period of time to contribute towards a specific project. Once a project is complete the group is disbanded and its members are assigned to new projects, hence the temporary character of project management teams operates as an overlay form from the matrix structure of home departments (Winch, 1994). Project management focuses on the technical specification of a project and how this can be met within the cost, profit, time, safety and quality constraints imposed on the firm by the client via a contract.

The theory and practice of project management

As a surround for temporary work structures project management contains four components. First, it is necessary to define the project and this is done in terms of an invitation to bid which is later formalized in a contract. An invitation to bid may come in the form of an open advertisement in the financial or trade press or alternatively a client may approach a contractor directly. Second, the project design process describes a series of interdisciplinary mechanisms and processes that are necessary to put a project together. These will be fleshed out from a successful project bid and relate to cost and quality specifications for equipment or service delivery within a defined time frame. The aim of detailed project design is to reduce the potential of operational uncertainties and risk, the design process includes risk assessments and details of logistical difficulties. The third component is project delivery and contains two sub-elements; scheduling that involves converting a contract and process design into an operating timetable and effective control of delivery whereby planned performance as defined by the design process and schedule of operations. Lastly, project completion and review assess performance, here the temporary nature of project teams creates the necessary transparency of operations and responsibility providing the potential for in-built performance management systems to incentivise or discipline team members (see Scase, 2001).

Project management by its very nature of bringing together individual specialists is a form of team working. However, in situations where highly skilled workers are brought together project management is something greater than a task-based involvement system. This prescriptive approach posits job enrichment and job enlargement with increased worker responsibility for quality and at the lower end this may involve job rotation or the performance of whole jobs as opposed to detail tasks in Taylorist work systems. For more skilled or knowledge-based workers multi-disciplinary project teams control and direct employees in relation to project design and delivery, yet where skills are highly specific specialised job-rotation is unlikely. It is more likely that project management systems coordinate skilled workers

in a customer-focused yet cooperative framework. Hence project management systems span the spectrum of control and consent. On the one hand they can result in direct control, limit discretion and secure compliance; alternatively, they can represent autonomous-high trust systems to harness cooperation and discretion. In Engineering services project management approximates to an operationally autonomous work group, albeit it ones who don't appoint their own leaders (see Bailyn, 1985; Cully *et al.* 1999, pp. 42-4).

The implications of project management for human resource practitioners

An awareness and appreciation of project management is useful to HR practitioners for three reasons. First, in knowledge-based organizations where skilled employees are the basis of a firm's competitive advantage it is increasingly necessary for the HR function to enable and support organizational capability within a project management environment through the application of appropriate policies for recruitment, selection, appraisal, development and reward – the core HR activities. The quality of a firm's human resources together with how they are managed can be a source of value and competitive advantage, the key question for practitioners is how do they secure and maintain these qualities? Support established approaches to the management of employment, employee resourcing and work organization or seek to manage, reform and shape these approaches? Second, in many sectors the project management process is controlled by professional managers who are beyond the immediate control of functional specialists such as HR's but with whom HR managers must interact, that is, following on from the first point, the two groups are interdependent. This relationship creates the possibility for conflict and learning in the management and reform of established patterns of project management. Third, the success of project management is highly dependent on people who run and operate such projects, to a significant extent they are the key resource. However, a cursory examination of HR texts as well as the prescriptive and critical literature in project management reveals little engagement between the two disciplines. For example, key texts on personnel management and work make no specific mention of project management as a framework for work organization, the lean or extended organization other than in the context of team working, (Bach and Sisson, 2000; Legge, 2000; Colling, 2000; Noon and Blyton, 2002). Similarly whilst Maylor (2002) and Scase (2001) each argue that project management is the core activity for British organizations, Maylor confines discussion of human resources to the issues of management and leadership whereas Scase examines the impact of project management on the UK's long-hours culture but not necessarily in terms of its effects on best practice or the labour process where commitment, monitoring and surveillance each represent a form of cultural control and psychological contract emphasising self-monitoring and self-imposed control. Lastly, WERS 4 (Cully *et al.*, 1999), examines issues of work organization and teamwork but unsurprisingly makes no mention of project-led organizations and the impact of this on work organization. Whilst Maylor (2002), McGovern (1998) and Scase (2001) argue that the project management environment is the reality or work for the majority of employees the effects, implications or presence of project management as a method of work organization, commitment and control is not taken up by personnel management specialists. In contrast to this, with the exception of Turner (2003), project

management specialists ignore the centrality of human resources concentrating instead on methods and tools, see Gray (1994) and Maylor (2002). Human resource practitioners are likely to have a key role in enabling and supporting the project-based organization create effective teams, patterns of competence and management development but never-the-less the role of HR practitioners is likely to be constrained by and defined within established systems of project management.

2. Context for project management: the engineering services sector

Engineering services specialists design, construct, equip and test investment projects for process producers, that is firms which manufacture a final product from a raw material via a chemical process for example, oil, gas, chemical, or steel production or oil and coal powered electricity-generators. The main clients are therefore oil refining companies and firms what produce chemicals. In addition to these relatively standardized but technologically complicated process projects, engineering services specialists design and manage unique civil and infrastructure projects, for example, airport terminals, bridge construction, the Channel tunnel, the construction or extension of over-ground or under-ground railway systems and nuclear power stations. It is important to emphasise that engineering services is a very broad sector spanning a whole range of sub-sectors and that particular firms may operate across the whole range or specialise in one or two of them. The average cost of a project in the process sector is \$300 million but some super projects can be \$1billion or much higher in the civil engineering sub-sector, such as the renewal of the London to Scotland west-coast main line where the projected cost is £55 million per kilometre on current projections, (Exbeck briefing document). For further details of the sector and its characteristics see Colling and Clark (2002).

The case study firms: Engserv and Exbeck

Engserv, a pseudonym, for a well-established American multinational market leader, has an annual turnover of \$4 billion and employs 10,000 worldwide. The firm was founded at the turn of the nineteenth century and established a UK presence in the early 1920s. Operations initially centred on the development and manufacture of boiler technologies but the firm followed a post-war trend into engineering services and project management (see Dunning, 1998).

The British subsidiary specializes in large technologically complex contracts in the process engineering area which specify specialist front-end design and engineering that involve close, high-trust relationships with UK clients in oil and chemicals. Whilst worldwide Engserv operates through two divisions, construction and engineering (C&E) and energy equipment (EE) the British operation specializes in the C&E side of the business that has grown rapidly. Currently, UK-managed C&E operations account for 74 per cent of Engserv's global turnover, 70 per cent of profits and 70 per cent of new orders. The UK operation employs two-thirds of the non-American workforce, approximately 3,000 employees. All interviewees suggested that to all intents and purposes the British subsidiary operated as a stand-alone firm.

Exbeck, a pseudonym for a privately-owned American firm, is a much larger global player than Engserv. Worldwide Exbeck employs approximately 50,000 administrative, clerical and technical staff and 10,000 craft workers including engineers, project managers, specialist process engineers, chemists and physicists.

Like Engserv, Exbeck was founded at the turn of the 19th century. Initially Exbeck operated in railroad construction, developed into dams, pipelines, refineries, power plants, nuclear installations, airport construction and defence and space engineering systems. As a privately-owned company Exbeck's profits and turnover figures are less transparent than Engserv's, however, the 2002 company report reveals \$9.3 billion in new work and \$13.4 billion in revenue work off in 2001. Currently the firm is operating 950 projects in 67 countries. Exbeck operates two global business units, Systems and Infrastructure and Engineering and Construction which divides into six sub-sectors (telecom and industrial, petro-chemical and process, mining and metals, civil, power and pipeline). Currently Exbeck is heavily involved in process industry recovery in Iraq.

Research methods

In addressing the research question the case study approach is particularly illuminating because in order to assess the significance of project management and the consequences of this for HR developments it was necessary to establish how patterns of project management manifest themselves and moreover why they persist. For Engserv the material draws on 12 interviews conducted with nine executive management staff from human resources, finance, project management and specialist engineering functions. Employee perceptions on management innovations were also gathered through ten interviews with a sample of engineering staff ranging from relatively new graduate recruits to long-standing engineering specialists. For Exbeck the material draws on ten interviews with senior management in human resources, project management specialists in process engineering, infrastructure and civil engineering and five employee attitude interviews with project management specialists. Several of the interviews with project management specialists were followed up by telephone interviews as some respondents had moved to project management site operations or left the UK subsidiary to work on secondment elsewhere. In both case firms employee attitude interviews and interviews with senior staff beyond the HR function represented an important source of information on the impact of HR innovations on project management.

Both firms allowed participant observation of site operations. In addition to interviews, company documentation – handbooks, newsletters and library materials – were drawn on. The main body of the paper draws on the transcripts of all the interviews conducted and therefore incorporates corporate and middle management views and those of line managers beyond the HR function.

Uniform methods are in use across the cases and semi-structured interviews were conducted where interview schedules follow common formats incorporating core analytical themes tailored to specific sector and company environments. Interviews are tape recorded, transcribed and coded for wider comparative analysis using QSRNS qualitative data software. Typically interviews are of one and a half to two hours in duration.

Project management is a particular feature of Engineering Services for two reasons. First, the key resource that firms have to sell to clients are professionalism and technical expertise, both of which can only be realised once engineers work on projects. Second, firms whilst they may be market leaders in the sub-sectors where they specialize are client driven. Process producers (oil companies) or infrastructure

providers (London Underground, Network Rail) issue invitations to bid on a project-by-project basis and although partnering arrangements (systems of preferred bidders) aim to ensure repeat business, the structural mechanisms of an invitation to bid and the project tender are essential contractual and technical features of this sector.

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As a particular feature of engineering services, project management is a key influence on the management of human resources and two consequences flow from this. First, professional engineers control project management and the provision of engineering services. They and the operating procedures within which they work are the bases of competitive advantage and these procedures are robustly defended through an embedded engineering culture that is highly visible in the case study firms. Second and related, bidding and the associated costs of bidding are incurred by firms “up-front” before they win or lose a tender. The embeddedness of the engineering culture and the sacrosanct importance of control over the bidding process for engineers create an air of skepticism for many HR initiatives. This reflects not only the conservative nature of the engineering culture but also indicates and reflects the technical knowledge and professionalism of management within this sector. The impact of the embedded engineering culture in the case firms echoes the observations of Kunda (1992) who highlights the constraining effects of professional sub-cultures on organizational change originating beyond a dominant professional group – in this case engineers and project management specialists. The engineering culture creates clarity of mission where engineers formulate project design and specify appropriate technologies with complete autonomy from technical controls formulated by functional areas of management such as finance or human resources. Rather, the client-contract operates as a technical control that produces daily monitoring of working hours and weekly and monthly allocation of labour costs to budgets that requires professional engineers in both case firms to use a swipe card clocking-on system.

3. Enabling or reforming the management of engineering staff in engineering services?

Both case study firms face two developments that have stimulated attempts to modify their approaches to project management. First, maintaining competitiveness in the context of common competitive pressures that have cut profit margins. Second, both firms face further competitive pressures that result from in-house difficulties. At Engserv, the consequences of one bad contract in the USA during the 1990s still reverberate around the firm. The ramifications of this are twofold. First, the firm is subject to far greater short-term pressures than previously, manifest in significantly greater scrutiny by financial analysts and associated pressures in terms of shareholder value. Second, as the UK subsidiary is the most profitable section of the global business it is subject to more onerous profit targets set by the corporate centre. In-house developments at Exbeck were of a different character but created similar operational problems. In an era of reduced profit margins corporate executives found an established “hands-off” approach to project management design and execution was problematic in terms of completing projects at or near the specification formulated in a

project tender. An internal business review concluded that a key problem in this respect was a lack of standardization in project management across the global firm.

In the context of these developments each firm sought to review, revise and reform the relationship between project management and human resources. Engserv exercised this indirectly by aiming to improve the operation of firm-specific, but de-centralized approaches to project management including within this the management of human resources at the British subsidiary. Exbeck introduced a project task force (PTF) system – a direct approach that aimed to standardize the project management process. The empirical material reveals the separate courses of action taken by the two firms, examining the differences and similarities in each series of choices.

Improving general management skills at Engserv?

Engserv operated on the basis of stable product markets and regular business until the early 1990s, one effect of this was the exclusion of the human resources function from the finer details of project management. One of Engserv's particular selling points to clients is the large number of permanent staff on its books. Interviews with line engineers confirmed this picture and revealed that many employees had service periods of up to twenty years and that some had never worked for another firm. However, the cumulative effects of external and in-house developments stimulated the HR function to suggest that a greater level of functional flexibility was necessary, for example moving nominally dedicated engineering specialists into new areas of work, particularly at middle and senior management levels:

The only thing Engserv has got to offer clients is the knowledge of its employees. Basically 50% or 60% of people in the organization are degreed engineers . . . can go anywhere to get a job. They are just as likely to end up in banking or IT as engineering, right (HR respondent, Engserv).

The British subsidiary worked hard during the early 1990s to keep engineers and was able to respond to subsequent up-turns in business activity but in the current context of corporate and market uncertainty, a key challenge for engineers and the HR function is to resist pressures to downsize and retain and develop junior and middle grade engineers to more senior management grades. Engineers argued that this was essential because shedding staff sends negative signals to the market and more importantly clients and further, the sunk costs of training and development are written off. To re-recruit an engineer is problematic – the market normally snaps them up or if they are employed as a temporary or agency worker the remuneration package demanded will be highly competitive, in all likelihood greater than established salary costs. Whilst there is agreement on the merits of retention, there is a marked difference of approach between the two groups of management. The HR function seeks to promote the importance of more general management skills in the face of uncertain market conditions, put more simply it seeks to find things for permanent staff to do. In contrast to this, interviews with departmental managers regularly highlighted the importance of exposing engineers to clients and projects to build their portfolio of competencies and skills which is essential to acquire chartered engineer status in a particular engineering specialism. That is, reinforcing the specialism of engineers rather than making them more flexible or multi-skilled.

In contrast to this view, HR suggested that project management necessitates the deployment of many specialists which Engserv has developed as functional engineering specialists, that is, professional engineers. This characteristic creates and legitimises well-defined functional boundaries amongst the engineering cadre which departmental managers view as beneficial to the firm:

15 years ago, a number of people in Engserv tended to think of themselves as professional engineers and you know that is what we are here for. We do professional engineers, not we are here to be in business, we are here to make money for Engserv and to please the client and provide them with cost-effective solutions (HR respondent, Engserv).

The difference in approach and the difficulty of developing more generalist management skills that concentrate less on a specialist area of engineering relates directly to the sectoral characteristic of project management. Technical competence and professional expertise is acquired in the main by on-the-job portfolio training and exposure to the project environment and this is reflected in the entry standards for chartered status in a particular engineering specialism. Improvement in general management expertise requires more formal training, which several interviewee respondents suggested Engserv was not particularly good at providing because of the tradition of portfolio training:

On balance we have done a reasonably good job in terms of training and development. However, compared with other industries, there is still a significant amount of work to do to get this sort of organization, which is knowledge based to continually train and develop its staff. To be brutally honest, we have got enough technical skills in the place to last us a lifetime. The big issue, and what gives us the edge, is how we orchestrate those technical skills for the customer in a more productive way (HR respondent, Engserv).

For Engserv's HR function this aspiration prescribes greater flexibility of engineers across specialist functions to create a system of general management skills, for example a specialist vessel or mechanical engineer undertaking training and development in order to apply their distinct skills in a new or related area such as electrical engineering or pump engineering.

Engserv's appraisal scheme, the individual performance system (IPS), is central to the aim of integrating HR innovations (improved flexibility and wider managerial competency in project management) to create a broader management development system for project management. Bearing this in mind the IPS aimed to identify career and personal development beyond the narrowly defined confines of a particular engineering specialism.

However, interview data gathered from line managers either subject to or responsible for operating the IPS suggested mixed results and tended to indicate that improved flexibility and general management competencies remained undeveloped. For example, whilst most managers found the annual IPS to be an improvement on what went before, several indicated that for a variety of reasons they either missed their IPS or had not had one scheduled – because they were out on site or because they were able to skip it due to work pressures. Others found it of little use, preferring to negotiate career and personal development with their line managers, confining their comments to the reward implications flowing from the IPS:

I feel at the moment that I don't need IPS or the form to know where I am going or how I want to develop. So overall, the communication system works pretty well but IPS itself is a bit of a bolt on to that it's a bit superficial really (Senior Engineer, Engserv).

[On experience of the IPS]: ... it actually turned up when I was on assignment. I was in Scotland, "congratulations thanks for your flexibility here's some money" So that was it. I got a phone call two days later or something, just to check I had received it. Normally, they just call you into the office, hand over the letter to you. I don't know if they gauge the expression when you open it (Engineer, Engserv).

[To what extent is improvement in pay dependent on your own individual performance?] I am not convinced my boss would have that much power. Even if he thought it was good, he would be very limited in terms of what kind of increase above the norm he could actually give you. We have heard rumours that there actually are these bonuses that he does have, if there is money in the kitty, so he can give you a one-off payment. But I would say he stuck (Engineer, Engserv).

The impact of Engserv's approach to appraisal and reward on the flexibility of engineering specialists in project management is uncertain. Clearly, as HR policies they are in place, yet a central weakness is the lack of purchase that the development or reward aims of the IPS has on staff views of their career and professional development. Engserv's HR function was equally critical of the way the IPS operated and for both engineers and HR staff the issue of substance is the project management environment and cost control. This produced general pressures to contain labour costs but more significantly disrupted attempts to link pay and performance systematically with any dispersion in pay representing "fire fighting" efforts to retain junior staff.

Our interview data and the specific quotes from it are significant because they reveal the continued importance of professional project management identities and portfolio training as a central mechanism in the development and management of specialist knowledge in this sector. The continued significance of home departments and departmental managers and the perception that the management of professional engineers and their technical expertise remains therein necessarily follows from this. Several interviewees argued that line managers were more influential than management development mechanisms, beyond the project management process, because they had day to day discretion over *ad hoc* development and training opportunities on new projects. In the sectoral context of little formal training, these were decisive in determining career progression and certainly more influential than "development intentions" listed in an IPS.

Project task forces at Exbeck

Exbeck's project task force (PTF) system aimed to standardize project management and give corporate management, in particular the human resource function, direct involvement in project management procedures across all the sub-sectors where Exbeck operates. By standardizing the project management process, PTFs aimed to provide a structure to make project management a more generalist management skill across the sub-sectors that constitute engineering and construction. Under the PTF system a "construction and contracts" manager prepares a briefing document on the technical and process requirement of a project. In addition they provide a forecasting plan for human resource needs over the length of the project. A provisional PTF becomes "live" if a tender wins a contract, and the human resource function identifies

staff training and development needs and works with the PTF manager to ensure accurate human resource scheduling to preclude cost overruns. The corporate human resource function implemented management development for PTF management design and resourcing and monitored operational performance in PTFs:

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To achieve this we presented the integration of the HR function within PTFs as an exercise in quality assurance that involves two aspects. First, re-branding our human resource staff and services as central actors and mechanisms within PTFs, to identify and cost the human resource requirements at an early pre-planning stage. Secondly, demonstrating the benefits of our human resource “audit” strategy to line managers in PTFs (HR Director, Exbeck UK office).

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The PTF system aimed to turn project managers dedicated to a specific sub-sector into generalist project managers, some of whom, after more general management training, could operate as PTF managers across the engineering and construction sub-sectors:

Exbeck now sees itself as a “trouble-shooter” in project management, this involves us delivering our performance or someone else’s better. Here it is necessary to control overhead which for HR is a given, the introduction of task forces and a lessons-learned programme is designed to enable us to improve what the field workers do and our own internal marketing – you know raising our profile (HR director civil and process engineering, Exbeck, UK office).

The directors of HR at corporate HQ and the British subsidiary presented the integration of routine human resource servicing requests into operational procedures for PTF managers as a mechanism to reduce uncertainty over the cost and scheduling of labour. As a direct and standardizing intervention in project management this challenged the autonomy and knowledge base of project management staff. Equally, many engineering specialists, dedicated to a sub-sector, had developed their own methods of control and decision making over project operations either at the planning and tender stage or on site. Interviews established that in many cases these techniques were a direct reflection of operational experience, demonstrating the importance of specialist portfolio training and resultant chartered status in a defined engineering specialism. Several project managers revealed efforts to defend established approaches and resist the operational effects of standardization in the project management process. For example, Interviews revealed that whilst project managers in civil, process and infrastructure project management accepted the presence of human resource staff in PTFs, acceptance of their monitoring and audit roles was more uncertain. Gradually project management staff began to fall back on their customary and individually regulated codes of behaviour. More significantly, interviews with engineering and project management staffs established that colleagues in the HR function were impotent on the auditing front. Cost schedules might determine the cost of labour per man-hour etc. but HR staff were unable to determine if the selection of staffs, the numbers involved or the lengths of engagement were accurate. In effect they merely reconciled labour use against established costs (see Clark, 2001).

Attempts to involve the HR function within engineering management at Exbeck encountered similar difficulties to those found at Engserv resulting from the embeddedness of its engineering culture. This culture known as “the lone ranger”, a reference to project management specialists and site engineers in engineering and construction’s sub-units who managed projects in a highly individual and

idiosyncratic manner. For example, some managers had created their own “teams” who moved with them from project to project. Across Exbeck’s span of sub-sectors, comparatively sheltered competitive conditions during the 1970s and 1980s underpinned operational independence from the corporate centre and legitimised “lone ranger” approaches to project management. At Exbeck, project management represented not only a particular work practice in the engineering and construction sub-sectors but created an errant engineering sub-culture described by Kunda (1992).

Project management staff found that HR colleagues – now part of the (PTF) team – appeared willing to service and cost their own monitoring audits. This involved getting human resources to do the work because “they were the experts”. It became clear that many PTF managers remained wedded to their engineering specialism and refused to see themselves as generalist project managers.

Several engineering and project managers continued to work in their own way, merely passing their labour requisitions to HR staff whom they saw as corporate monitors. Finally, similar to the situation at Engserv, no evidence was found to suggest that project management was becoming a more generalist management function. Project managers and engineers were not deployed beyond their specific sub-sectoral area of expertise. However, HR staff appeared unconcerned about these developments because the PTF system improved financial performance and resistance to it was characterized as transitional:

Look, in broad terms they are following the new procedure, the fact that we help them shows they value our role. In fact it doesn’t really matter how the work gets done as long as it delivers – that’s the point. Over time they (project management staff) will work to book procedures (HR manager, UK PTF unit, Exbeck).

As colleagues get used to this it will be to use your words “integrated” in their work – costing and scheduling is vital, once they recognize this we can free ourselves up to concentrate on our manpower plan and necessary staff development spending less time chasing paper (HR Director, Exbeck, UK office).

4. Discussion and conclusions

Engineering expertise and identities dominate professional management in both firms whereas project management represents the core system that organizes and realises the expertise and skill of professional management in this sector. The highly distinctive sector-driven approaches to project management and associated systems of staff development and training reported on here have a considerable impact on the HR function and efforts to improve and become involved in the project management process. However, there are differences as well as similarities between the cases.

The differences between the two relate to the size of the two firms and much wider span of sub-sectors where Exbeck operates. The size and span of operations provided a firmer platform for the introduction of a standardized approach to project management and a significant enabling role for the HR function but the professional sub-culture of autonomous lone ranger approaches to project management appeared to continue, particularly at site level. At Engserv, a much smaller operationally de-centralized niche provider, such a platform was absent, pushing attempts at greater engagement between the HR function and line management back to operational level. Here autonomous revise, revamp and reform initiatives for training and development and

reward represented an attempt to manage professional labour in a more strategic manner. However, for success, this approach rests on gaining some purchase on project management procedures, which at Engserv the development and flexibility aims of the IPS, with only limited success struggled to gain.

The similarities derive from competitive pressures in the sector and more immediate in-house pressures in terms of financial performance. In both cases the volatility of the project environment and the professional labour market characteristics of engineering staff diluted the operational impact of the revised measures. At both firms the importance of professional portfolio training to engineering staff weakened the efforts of the HR function to generate greater flexibility and was manifest in a clear difference between the views of line management and the HR function on how to deploy and manage highly skilled engineering staff. To appreciate the divergent views of professional engineers and HR specialists rests on recognising that for many engineers an established pattern of project management is the competitive advantage of each firm and is not a constraint on efficiency or efforts by the HR function to standardize revise and reform specific aspects of project management. For example, interviews established that cost control is always an important consideration and is particularly so for smaller clients; however, there are constraints on the extent to which cost cutting can be achieved. Interviews with line managers revealed that cost savings are most often made by innovation in the execution of projects and in project management; this is a key point because knowledge about how and where cost savings can be made remains necessarily with engineers and beyond the influence of the HR function. For example, making specialist engineering staff more flexible project generalists can have only a marginal impact on labour costs within a project.

A second related similarity between the cases derives from the impact of autonomous professional management who qualify through following necessarily functional portfolio training and development. Autonomous professionalism and portfolio training represent the established context of project management in engineering services and as long as the latter leads to the former the significance of formal training and a broader more flexible development of human resources will be constrained. Further, the significance of portfolio training underlines the difficulties Engserv's IPS system has in engaging the attention of engineering staff in terms of career development and reward. At Exbeck, the centralized PTF system is necessarily implemented in the distinct sub-sectors where the firm operates, placing the system in the hands of professional managers who, whilst they accept the presence of HR professionals, seek to minimize their operational intervention in project management – the knowledge base of professional engineers.

To secure more engagement between the HR function and engineering procedures, the two firms took different courses of action but encountered similar difficulties. One consequence of the similarities between the two cases is that highly specific project management practices may constrain the operational impact of HR strategies, whether they are conceived as enabling and supportive or controlling and reformist. For example, as feedback on project performance lies with departmental managers who second staff to projects, training and development, reward, status and recognition of engineers is traditionally beyond the control of the HR function, creating a boundary between project management and functional management. Thus, the internal processes of project management, the cohesive norms and roles of team members,

their motivation and reward are defined by the engineering sub-culture that emphasises separation between the two groups not interdependence particularly over the performance and viability of team effectiveness. Second, although these findings are necessarily sector specific they can be generalised as significant to HR practitioners in other sectors where similar patterns of professionally controlled project management are present. This suggests that HR practitioners are more likely to succeed in enabling and supporting established systems than seeking to manage reform or shape them beyond the constraints of operational frameworks that determine competitive advantage.

In engineering services, project teams coordinate the activities of relatively independent human resources and coordination within project management refers to and relies on established sets of relations and practices beyond the jurisdiction of the HR function. Whilst projects represent temporary systems for control and coordination, they are more than temporary because every new project is based on experiences in previous ventures. Yet every project is to some extent unique and successful HR practices, for example training by portfolio and narrowly defined engineering specialism become embedded structural features that reproduce and strengthen the affiliation of individuals to such practices. As the cases reported on here demonstrate, tighter competitive pressures reinforce the importance of embedded systems to line management and it is this that constrains the HR function if its policies and strategies appear to challenge established systems. The challenge for HR practitioners who operate in a project management environment is to devise and effectively communicate methods and policies that enable and support established management systems to become more effective whilst not appearing to challenge the basis of competitive advantage in established patterns of project management.

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