Pergamon

European Management Journal Vol. 17, No. 3, pp. 296–309, 1999

Printed in Great Britain
PII: S0263-2373(99)00009-2
0263-2373/99 $20.00 + 0.00

The Versatile Project-based Organization: Governance and Operational Control

J. RODNEY TURNER, *Erasmus University, Rotterdam*
ANNE KEEGAN, *Erasmus University, Rotterdam*

Throughout the latter half of the 20th century, there has been a shift in the management paradigm, from the functional, bureaucratic approach, almost universally adopted in the first half of the century, to project and process-based approaches. This shift has been in response to the changing nature of work from mass production, with essentially stable customer requirements and slowly changing technology, to the current situation where every product supplied may be against a bespoke design, and technology changes continuously and rapidly. Whereas the functional, bureaucratic approaches to management are underpinned by a strong theoretical basis, the classical theory of management developed during the late 19th and early 20th centuries, the process and project-based approaches do not have a strong theoretical basis. Furthermore, in adopting project- and process-based approaches to overcome the weaknesses of the functional approach, managers have also lost its strengths; they have not replaced some of the essential roles it fulfils. With the eventual aim of developing a theoretical basis for the project and process-based approach, which recovers the strengths of classical management, we at Erasmus University Rotterdam are conducting a research project to determine how project-based organizations are managed. In this paper we present initial findings, especially as they relate to the management of the process of product delivery, that is in the areas of operational control and governance. We also briefly review the issues identified in the management of human resources.

Introduction

Functional hierarchical line management was the main paradigm of management for nearly two hundred years from the late 18th century until the mid-20th century. However, since the 1950s it has been necessary to adopt project- and process-based approaches to management to respond to the almost constantly changing nature of work and management. A consistent, classical management theory was developed to underpin functional hierarchical line management, and some of it basic premises were adopted almost as axioms of management. As people have adopted project- and process-based approaches, either they have tended to assume that these axioms, or orthodoxies, have still applied, or they have not developed a consistent theory to replace them. The result is that while managers have adopted a new approach to management that addresses the weaknesses of classical management within the modern, changing environment, they have at the same time lost its strengths; they have not created mechanisms to replace some of the essential roles fulfilled by the functional organization. Thus, project- and process-based approaches to management have not been the unbridled successes that they were hoped to be.

At Erasmus University Rotterdam, we are conducting an international research project into how project-based organizations are managed, with the eventual aim of developing a consistent theory for project- and process-based management, to replace the classical management theory in project-based organizations where it does not apply. We aim to show how managers can recapture the strengths of

the bureaucratic organization within the versatile, project-based organization.

In this paper we describe our initial findings, particularly as they relate to the management of the process of product delivery in project-based organizations, that is in the areas of operational control and governance. We trace the development of management, from the classical approaches through to the modern project- and process-based approaches, to understand why each was adopted, and how the axioms of the former do not apply to the latter. We then introduce our research project and the companies interviewed. We describe how the organizations interviewed implement process management through the operational control and governance models adopted. We identify the strengths and weaknesses of the approaches, and the challenges and contradictions encountered. This will begin to enable us to identify what elements of classical management theory can be applied to project-based organizations and where new concepts are required. We also briefly introduce consequences for human resource management policy, particularly careers, skills development and organizational learning. The full description of those are left for another paper.

The Historical Development of Management Models

Turner (1998) traced the development of management from the classical, bureaucratic approaches through to the modern project- and process-based approaches, to understand why the shift in paradigm was required, and why the strengths of the functional approach that made it so successful for 200 years, became weaknesses in the modern era.

Functional Hierarchical Line Management

Functional hierarchical line management achieved its ascendancy during the 19th century and reflected social, technical and managerial innovations of the day. Victorian engineers were building great machines to harness the forces of nature:

- steam engines to harness the force of steam
- hydroelectric dams to harness the force of water
- so why not organizations to harness the force of people?

Functional, hierarchical line management was underpinned by classical management theory, (Morgan, 1986, 1990), which pulled together three threads:

- the economic theory of Adam Smith (1776) and the striving for greater economic efficiency
- the scientific management theory of Frederic W. Taylor (1911) and the idea that the work of people could be made as predictable as the work of machines
- the scientific administration theory of Henri Fayol (1949) and the idea that organizations could be designed with military or engineering precision.

Smith (1776) laid the foundation for classical management theory, with his proposals for the specialization of work and the striving for greater economic efficiency. So great has been his influence that his basic premise that ever greater economic efficiency is better goes virtually unquestioned, driving many organizations into corporate anorexia.

"As a model for the governance of nations, centralized planning has been an unmitigated disaster"

The efforts of 19th century managers to mimic the harnessing power in machines relied on making work as routine and predictable as possible. This orientation towards the design of jobs was encapsulated in the writings of F.W. Taylor (1911). He argued that there are five basic principles that lead to the efficient organization of tasks:

- shift responsibility for designing work to managers; leaving workers solely with the task of doing
- use scientific methods to determine the most efficient way of working, design the task accordingly, and specify the task precisely
- select the best person to perform the job thus designed
- train the person to carry out the job as efficiently as possible
- monitor the performance of the person to ensure work processes are followed and results are achieved as planned

Scientific administration, proposed by Fayol (1949); Mooney and Reiley (1931); Urwick (1943), mirrored at a macro-level the scientific management of work at a micro-level. Fayol and his followers suggested management is a process of planning, organizing, commanding, coordinating, and controlling. They advocated principles of management based on military and engineering ideals, drawn from experience of successful organizations, which they sought to codify as a universal theory of management. These principles included scalar command, division of line and staff functions, and a hierarchy of tasks with increasing responsibility for those further up the hierarchy. Weber (1956) described an ideal model of bureaucracy encompassing basic elements of management through enforcement of rules and procedures based on hierarchical authority. These rules and procedures provided clear guidelines for managerial action, promotion of workers, discipline and the control of the workplace.

A metaphor used to describe organizations designed according to this paradigm is the pyramid, [inappropriately according to Turner (1997)]. In reality they are two dimensional, comprising hierarchies and functions. Management within this framework is mechanistic. Its role is to oversee clearly defined and limited tasks of members lower down the hierarchy and to combine their efforts using a centralized planning and control. Management is assumed to be omniscient in its ability to foresee and respond to changes in the environment, (Burns and Stalker, 1961; Mintzberg, 1979). Weber (1956) and Orwell (1949) saw this model as basically dehumanizing for everybody, and Turner (1997, 1998) has pointed out that as a model for the governance of nations centralized planning has been an unmitigated disaster.

A core feature of functional hierarchical line management is the assumption that the work of an organization, its inputs, (human and material resources), and outputs, (products), are by and large unchanging. This enables the work of the organization to be divided into discrete, highly specialized functions, each of which undertakes a parcel of the work to process inputs into outputs. A necessary pre-condition for this model to be effective is that technology and customer requirements are slow to change, (Burns and Stalker, 1961; Lawrence and Lorsch, 1967). In a time when large manufacturing bureaucracies dominated, customer requirements were slow to change because customers had to take what they were given. Henry Ford said your Model T Ford could be:

> Any colour — so long as it's black. (quoted in Nevins, 1957)

Advantages, Orthodoxies and Disadvantages

The classically managed and organized bureaucracy was so successful because it has compelling advantages, which can be stated in terms of the way the organization operates:

1. Central planning provides a mechanism through which senior management can govern the organization. This governance can be elaborated according to the level of control management desires by

insisting on more feedback and communication from managers up and down the chain of command.

2. The functional hierarchy also undertakes operational control. Through the functions the organization transforms inputs into outputs step after predictable step. By controlling the functions through an ordered hierarchy, management also control the processes. In this way governance and operational control are aligned, and at times indistinguishable.
3. The line management structure is both a communication and co-ordination mechanism.
4. Functions provide careers. People progress in their careers by moving up the hierarchy within their function, by climbing the career ladder up the silo or smoke stack.
5. Individual learning is developed by functions that train people to do carefully prescribed work. As people's careers progress, organization members are trained to undertake various parts of the function's work. Furthermore the skills required are exactly predictable, because the work of the organization is unchanging.
6. The individual functions act as repositories for the organization's knowledge, which is easily accessible.

So compelling are the advantages that the three elements of classical management theory have become consolidated as three orthodoxies of management. So deeply ingrained have these three orthodoxies become that they are often treated as axioms of management, whereas they are in fact aims of the bureaucratic organization. As we shall see, in a project environment these orthodoxies are at best wrong, and at worst damaging. The orthodoxies are:

An Organizational Structure Orthodoxy: that there is only one model for the organization, called the structure, which fulfils the six functions 1 to 6 above.

A Human Resource Management Orthodoxy: that you grade the job and not the person.

An Economic Orthodoxy: that greater efficiency is better.

Functional hierarchies that adopt bureaucratic rule-like behaviour and a mechanistic approach to management can be highly successful under conditions where machines work well:

- ❖ there is a straightforward, repetitive task to be done
- ❖ the environment is stable enough to ensure the products are appropriate
- ❖ precision is highly valued.

This requires the human part of the organization, to behave like parts of a machine and comply with what the organization demands from them. However, these conditions do not always hold true, and where they do not the mechanistic approach to management inherent in functional hierarchies, centralized planning and rule-based authority has severe limitations:

(a) Bureaucratically organized firms have great difficulty adapting to changes in the environment. They are precisely designed to achieve certain goals as efficiently as possible. The endless striving for efficiency creates a 'corporate anorexia': stripping away organizational fat and with it the redundancy of functions and time which can be the source of new ideas, new products and new businesses. When the environment changes, the organization dies. Organizations can be too thin as well as too fat.

(b) The drive for stability leads to a loss of customer focus. Customers take what they are given, what the organization wants to produce for them. Coupled with this, the organization becomes very introspective. The structure exists because 'that is the way we do things', not for the sake of delivering desired benefits to customers.

(c) The more certain the environment (markets, inputs and labour) the more efficiently the firm can transform inputs into (predefined) outputs. The desire for a stable environment leads bureaucracies to become highly risk averse. With risk aversion comes suppressed creativity, low innovation and inflexibility of thought and action.

(d) The interests of those working in and having careers in the organization can take precedence over the goals for which the organization was established. The people can become introspective, and unable to respond to changes in the environment.

(e) The only route to promotion is up the functional career ladder. This results in the Peter Principle, (Peter and Hull, 1969), as good managers become poor administrators.

(f) The functional hierarchy can be dehumanizing, especially for those lower down, (Weber, 1956; Orwell, 1949). Creativity is squeezed out as work is defined in minute detail, rules are written for almost all contingencies and supervision over tasks is constant.

Project Management

The classical approach was first seriously challenged in the 1950s, and the need for new approaches has gathered pace ever since, (Morris, 1997). There were several causes:

- ❖ rapid development by governments of infrastructure and weapons systems in the immediate post-

war period, as a result of the Marshall Plan and Cold War respectively
- ❖ the space race
- ❖ the needs of the infant computer industry to embrace rapid technological developments
- ❖ the explosive development of products and technologies during the 1980s and 1990s
- ❖ the rise of consumer choice and the fragmentation of mass markets

These developments required the creation of project teams to undertake research, construction or development projects that were essentially unique, novel and transient, (Morris, 1997). Project teams could meld the skills of those working in different functions. In the beginning however, project management suffered from continued adherence to segmentalist thinking, (Kanter, 1983; Turner, 1998). Project teams may have had members from different functions but projects became isolated entities, looking inward to their own task and failing to integrate their efforts with other project teams and other organizational units. The old (technical) and the new (task) functions found it difficult to work together, and the old inflexibilities remained (Figure 1). Turner and Peymai (1995) identified several reasons, including:

- ❖ the new functions threatened the power base of the old functions.
- ❖ the paradox that projects exist short-term to achieve long-term objectives, while operations exist long term to achieve short-term objectives. Operations managers may agree the project is a good idea in the medium-term, but have to achieve today's production target.
- ❖ Projects are about upsetting the status quo and doing things in new ways, whereas operations managers try to preserve the status quo because that is how, as we saw above, they achieve ever increasing efficiency.

Projects are unique novel and transient, and hence a project is unable to benefit from any of the advantages 1 to 6 above, which promote the use of functional, hierarchical and mechanistic approaches to management. That is, (using the same numbers):

1. Every project is different requiring a different approach to its operational control. Hence project management breaks the link between governance and operational control which prevails in the functional hierarchy.
2. That also breaks the use of the functional hierarchy for communication and coordination.
3. Because projects are transient, they cannot offer people careers.
4. As every project is different, it can be difficult to predict the future skill requirements of the organization.
5. Because projects are transient they cannot become repositories for knowledge.

The stability and order underpinning successful functional bureaucracies is threatened by the project-based orientation of recent organizational forms. Flexibility must be built into project-based firms to allow them to meet unique novel and transient customer requirements. The three orthodoxies are at best irrelevant and at worst damaging in the project-based environment:

1. There is not one structure for the organization, but different models of operation for every project. People tried to overcome this by the invention of matrix management, (Morris, 1997). However, it has proved difficult to eliminate the conflict between projects and operations identified in Figure 1, and people find it difficult to work for two masters, (Turner and Peymai, 1995; Turner *et al.*, 1990).
2. It is not possible to grade the job; in the unique, novel and transient environment it is not even possible to define the job with any certainty. (In 6 years with ICI, Rodney Turner did six jobs. Only two of those jobs had been graded, and for one of those he did not receive the grade associated with the job because the project had not been sanctioned).
3. In the unique, novel and transient environment it is also not possible to be efficient. Indeed efficiency can be damaging, because, with projects being uncertain, it is necessary to build flexibility (fat) into the plans.

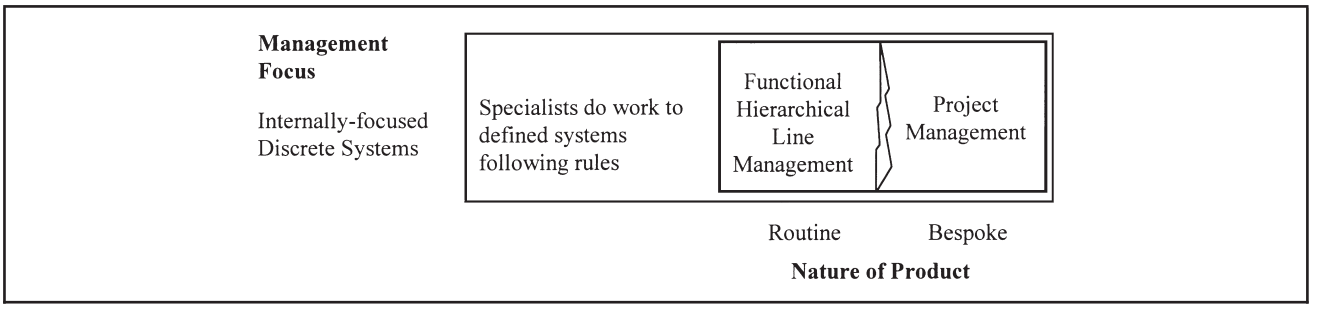

Figure 1 The Management of the Routine Versus the Bespoke, using a Discrete Approach

The Process Approach

So deeply ingrained in managers' thinking were the classical theories and three orthodoxies, when project management was first adopted between the 1950s and 1970s it was implemented according to classical principles. However, with the adoption of Total Quality Management in the late 1980s, the essential contradiction between the introspective nature of the classical approaches and the need for customer focus could no longer be ignored. Turner and Peymai (1995) document some of the dangers of rigidity of classical project management by describing what happened when a medium-sized construction company attempted to adopt ISO 9000. Working to internal procedures became more important than delivering customer requirements or desired benefits. They recommended a process-based, customer focused approach (Figure 2), and many of their recommendations have become adopted in industry standard approaches such as ISO 10,006 (1997) and PRINCE 2, (CCTA, 1996), in which:

- ❖ procedures are written to describe projects as processes which convert inputs into desired customer outputs
- ❖ project specific procedures are written for every project, based on the organization's global procedures, but tailored to the needs of this specific project
- ❖ throughout the process, and in particular at the hand-over from one function to the next, the product is checked against the needs of internal and external customers
- ❖ at the end of every project the global procedures are revised to reflect new learning

However, in overcoming the rigidity built into classical project management, organizations have made classical management theory totally irrelevant:

A. In trying to overcome the disadvantages, (a) to (f) on page 299, associated with classical management theory, all of the benefits, 1 to 6, have been lost.

B. The three orthodoxies are at best irrelevant and at worst damaging as described above.

C. And hence the process approach, at the moment, lacks a firm theoretical basis.

Our Research Project

At Erasmus University Rotterdam we are undertaking a research project to determine how versatile project-based organizations deal with issues of:

1. governance
2. operational control
3. leadership, communication and coordination
4. careers
5. individual learning and skills development
6. organizational learning

Table 1 contains a list of the organizations we have interviewed and a brief description of their main work. In the following sections we describe some of our initial findings, especially as they relate to operational control and the maintenance of customer focused processes. In summary, our initial findings are that the versatile project-based organizations need to:

I. Retain specialist functions. (In functional hierarchical line management it is the hierarchical line management that causes loss of customer focus and lack of versatility, not the functions.) The functions are responsible for maintaining:

4. careers
5. individual learning and skills development
6. organizational learning

II. Group the functions into versatile networks, with different networks for different customer

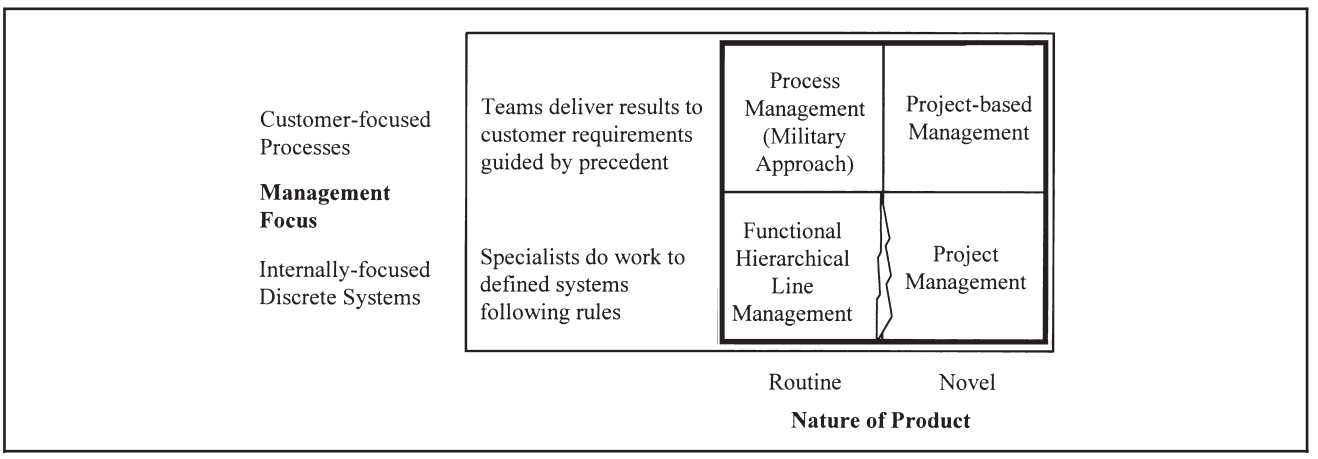

Figure 2 Four Types of Management

Table 1 Companies Interviewed

Company name	Country	Company type
Ericsson	Netherlands	Supplier of bespoke intelligent networks to the telecommunications industry
ABN-AMRO	Netherlands	Development division of a bank
Pink Elephant	Netherlands	Information systems consultants
Raytheon Engineers and Constructors	Netherlands	Engineering procurement and construction contractor in the oil, gas and petrochemical industry
ABB Lummus Global	Netherlands	Engineering procurement and construction contractor in the oil, gas and petrochemical industry
ABB	Austria	Engineering procurement and construction contractor in the power generation industry
Unisys	Austria	Supplier of computer equipment and bespoke information systems solutions
Unisys	UK	Supplier of computer equipment and bespoke information systems solutions
British Aerospace Defence Systems	UK	Supplier of bespoke electronic systems to the defence and other industries
GEC Dunchurch	UK	Training college of a group of companies in the electronic and electrical engineering industries
Reuters	UK	Supplier of business and financial data products
British Telecom	UK	Communications and data network operator
Posten State Data Centre	Norway	Supplier of bespoke information systems solutions to the public sector
University of St Galen	Switzerland	Established the virtual factory, comprising 30 companies from Germany, Austria and Switzerland around Lake Constance

requirements. Within the networks, there need to be new functions to:

2. coordinate and control the operation of the network

3. communicate customer requirements and strategy

III. Provide strategic direction and leadership to the functions, set empowering performance criteria, monitor performance against those criteria, and provide finance. This provides:

1. empowering governance which sets parameters for performance, but allows flexibility to be innovative to meet customer requirements, old and new

Diverse Models of Governance and Operational Control

In the classical management and administration model, the functional hierarchy serves both to control operations and to act as a communication and co-ordination mechanism for top management. This means that the day-to-day management of a classically managed firm is tightly coupled with the decisions of top management on overall governance of the firm. Furthermore, in the classically managed firm, operations are defined and controlled very tightly, and so governance tends to be involved at a very low level of detail. Under the principles of scientific management, individuals in the firm have very closely prescribed jobs. Their room for manoeuvrability is low. Governance becomes almost Soviet style central planning and micro-management. (Almost the only country in the world that retains this as a form of national government is North Korea, and even that is now changing).

Our research suggests that in the versatile, project-based organization, there will be a different model for operational control for each project, and that this will necessarily result in a decoupling of operational control and governance. This should then lead to a decentralization of decision-making on operational issues, with empowering governance. Governance should set high-level strategic direction and performance parameters, but, under a principle of subsidiarity, delegate day-to-day decision-making on operational issues to local management, management at a level where the decision has an effect. We saw this in some organizations, but in others, especially those with a background in the US or UK defence electronic industry, we saw the continued use of intrusive governance, Soviet style micro-management.

In most organizations we studied, operational control is outward looking, attending not simply to internal management of the task, but to the whole chain of activities through which inputs are transformed into desired customer outputs. The management of the interface with the client, and the delivery of desired customer outputs, infuses the work of versatile project-based firms. The delivery of superior performance for the customer, compared to what they could

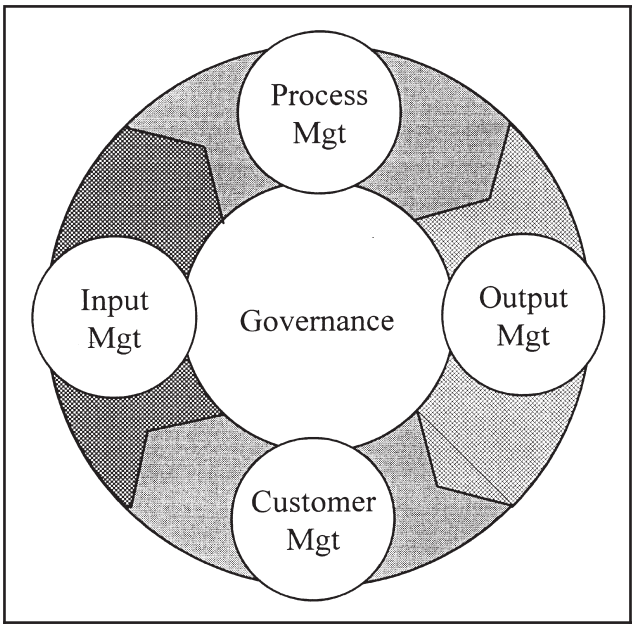

Figure 3 Four Elements of Operational Control

obtain from the competition, becomes a core value adding activity. Within the firms we have studied, there are four elements (or functions) of operational control (Figure 3):

1. client management
2. input management
3. process management
4. output management

The roles of these four functions of operational control are listed in Table 2. In the classically managed organization, they are treated as functions in a string, or value chain, (Porter, 1985). In project-based organizations, they operate in parallel, (shown as a loop in Figure 3). Turner (1997) suggests that in the versatile, network organization they can operate as nodes in a changing network of value added activities. Different products can be made for different customers by linking the functions of operational control together into different networks, and if this can be done quickly and responsively, the organization becomes truly versatile.

Operational Control in Practice

Our research has shown that different organizations implement operational control in different ways, according to the nature of the business, (products and

Table 2 Four Functions of Operational Control and One of Governance, and the Roles They Fulfil

Function	Roles
Client management	Identify and attract new clients Bid for and win work Liaise with the client during the work and delivery of the product Ensure the client is satisfied Win follow-on business
Input management	Ensure resources of the right number and skill are available Manage their development Manage their careers Care for their needs as personnel Ensure people are used efficiently
Process management	Manage the contribution of resources to the process Manage the delivery of components of the end product Ensure they meet the functional requirements of the end product Manage interfaces with other process managers Ensure people are used effectively
Output management	Manage design of the end product Manage its configuration during delivery Ensure the components and final assembly are delivered in accordance with the customers' requirements Manage hand-over to the client
Governance	Set strategic direction Set and monitor levels of performance, especially profitability Provide finance, and control financial returns Provide technical expertise through centres of excellence Provide an audit function Control risk exposure

Table 3 The Roles of Operational Control in Four Organizations

Company	Client management	Input management	Process management	Output management
EPC contractor — oil, gas and petrochem	Commercial director, bid managers	Resource managers	Lead engineers and project engineers	Project directors
EPC contractor — telecommunications	Account managers	Competence managers	Project managers	Solutions managers
Computer systems supplier — Head Office	Domain managers	Line managers	Technical managers	Project managers
Computer systems supplier — satellite	Domain managers	All of these roles are undertaken by project managers		
Telecommunications network operator	Customer account management	Back office	Customer account management	Operating divisions

customers), its historical background and the philosophical approach of management. In this section we describe how four firms in our sample approached operational control (Table 3 Figure 4). The firms assigned various titles and descriptions to their personnel, because of the differing nature of their businesses.

Illustration One: EPC Contractor, Oil, Gas and Petrochemicals

The first company deals in large to major projects. A project may cost upward of £100 million, and involve 1 million hours of design. Given the scale of business, this company has only a few potential clients, with whom the company seeks to maintain close relationships. Illustrating this, one respondent said of their main client:

[The company] are our past and our future.

The market in which this company operates is well established. Because it is one of the few major players with the capacity to meet the needs of clients, the necessity to find and attract new clients is low. The key to future contracts lies in satisfying clients, providing them with superior performance. Client management is therefore the first key function of operational control. At the front end of a project, there is a strong emphasis on bid management, to win the work in the first place. Once won, projects are managed through to completion by a project director, who maintains a close working relationship with equivalent people from the client organization, and ensures eventual delivery of an operating facility to the client, which provides them with superior performance. This continuity is necessary as projects can be very complex and involve a wide range of people from within and outside the firm.

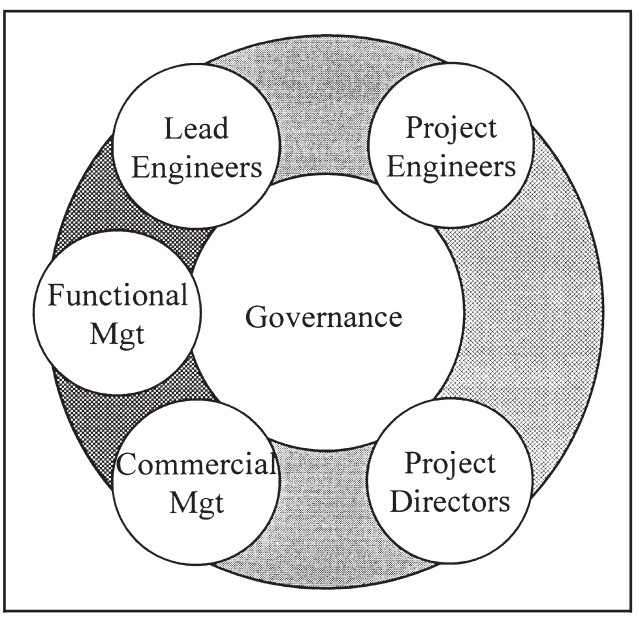

Figure 4 Operational Control in an EPC Contractor from the Oil Industry

The second function of operational control, through which firms add value is input (or resource) management. Resource management refers to both human and non-human resources. Resource managers are responsible for ensuring the organization has the right number of people of the right skills, managing their careers, and ensuring they are used efficiently. This organization sells the knowledge of how to carry out a project from beginning to end. It is a knowledge-based organization and employees are a key resource. They are highly educated and trained technical experts. With this kind of human resource, keeping people busy on projects is essential. A project director we interviewed said:

If our people are idle we are dead.

The third function of operational control is the transformation process, and this is the responsibility of lead and project engineers. Lead engineers manage the technical input to the project, the delivery of the components of the product, and ensure that standards of safety and quality are adhered to. Project engineers manage the delivery and configuration of those components into elements of the product. Finally, the project director manages the assembly of those elements into the final product of the project to produce the desired customer outputs. It is the project director's responsibility to produce a product

that meets the customer's functional requirements at the best time and cost. They therefore have responsibility for both output management and the last steps of client management to complete the loop.

A strong message to emerge from this company is that project professionals, (engineers, managers and directors), are the most highly regarded people. There is much investment in their training and they have the longest length of tenure. Many of the people we interviewed stressed the ability of the project managers to add value both for their own organization and for the client by the effective delivery of the projects' outputs to time, cost and functionality. Because the technology with which this organization works is widely available, the only way for this organization to provide their client with competitive advantage is by being more effective in the delivery of the projects' outputs. The way project managers make a profit for their company as well as the client is by being better at managing risk than the next supplier.

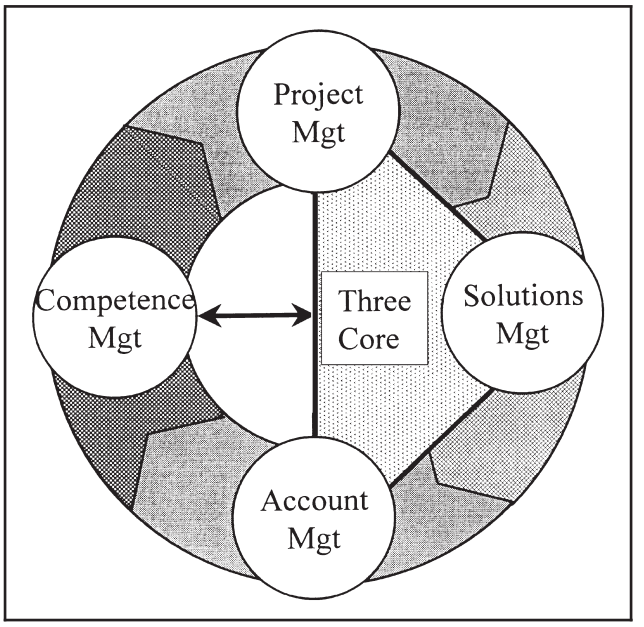

Figure 5 Operational Control in an EPC Contractor from the Telecommunications Industry

Illustration Two: EPC Contractor, Telecommunications Industry

This company makes networks for land-based and mobile telephone operators, based on their expertise in intelligent switches. In contrast to the company in illustration one above, their projects tend to be much smaller and in reality are sub-projects of longer-term programmes of development. Their clients are very dominant and have agreed single supplier relationships with the suppliers in certain geographical regions.

The close links between this company and the network operators means it is essential they maintain excellent working relationships with their clients. To achieve this the company appoints account managers. Following our schema of core activities, account managers manage the client relationship and control all of the main client interface activities. Solutions managers work with the account managers to deliver facilities that meet client needs and thus manage the process. Account managers and solutions managers are based within the companies Sales and Marketing Department. They are supported by project managers from the Operations Department who manage the individual projects to deliver parts of the overall network, the output. They call this triumvirate '3-core' (Figure 5). The Competence Management department nominally controls the organization's human resources. They are provided to each project on a project-by-project basis. However, in reality movement from project to project is limited to projects for the same client. There are two reasons for this:

1. People in the organization have very high workloads. It takes two years to train somebody in the use of the company's technology, and hence using contractors to balance the work is not an option. Work is balanced by people working between 7 and 14 hours a day, and as one project comes to an end, they go straight on to another.
2. The client's solutions are highly specialized, making it necessary to maintain strict Chinese walls within the organization, to stop one client learning of another's expertise. This is different from the previous example, where the technology was widely available. Competitive advantage came from by being able to deliver the projects' outputs more effectively. Here the technology is proprietary and provides competitive advantage in itself. Hence the need to maintain client confidence, even within the organization. Strangely this high customer focus leads to a loss of versatility and organizational and individual learning as people remain working for one client from one project to the next.

Illustration Three: Computer Systems Supplier

The third illustration is a computer systems supplier. This company used to be just a supplier of hardware, particularly mainframes. Recently, all this has changed. With the shrinking margins in the computer hardware industry, they have moved their business into computer systems solutions, providing the complete IS/IT solution for their clients. The culture within the organization is dominated by a functional, hierarchical, line management mindset where there is an emphasis on tangible products and efficiency in operations. The new emphasis on solutions is a dramatic change for the organization and requires greater project orientation on the part of the whole

company to cope with the demands for customized client-led solutions. According to one respondent, the new environment is characterized by:

> Chaos, temporary networks, co-ordination and co-operation

The management of the company in terms of clients, inputs, processes and outputs is shifting to meet the new needs of the solutions-driven environment although the change process is slow and the challenges still emerging. One way the company seeks to effect this change is to concentrate on people and institute changes to careers and to attitudes to facilitate the change. At the European headquarters in London, we found the implementation of four possible career tracks for managers reflecting the core activities of operational control in our schema:

- ❖ domain (or client) management
- ❖ line management (input)
- ❖ technical management (process)
- ❖ project management (outputs)

Employees join the organization as consultants. As their careers progress, they decide which of the four tracks they wish to join. The training paths tend to diverge reflecting different needs in each path. Although the decision is not irreversible, the head of competence management did note the narrowing of opportunities as employees advance further and further in their chosen direction. The company recognizes that there is a need for the four separate 'tracks' within its operations to allow those best suited to travel the path most fruitful for them and the organization. By training people within the diverse tracks, the company ensures it can meet the different needs of input, process and output management, as well as client management.

We also interviewed people from their Austrian subsidiary and found a different pattern of operational control of the key activities. The Austrian division has implemented a totally project-based way of working in their main group. Project managers fulfil the roles of input, process and output managers. They have retained client managers to find and win new clients. By fulfilling so many roles, it is possible that project managers will face conflicts of interest. For instance, they may be forced to make choices between:

- ❖ learning experiences for individuals in their role as human resource manager
- ❖ the efficient utilization of human and other resources
- ❖ finding the best person for the project
- ❖ sharing people between projects to find the best solution for the organization
- ❖ achieving the most effective delivery of their project
- ❖ doing what is best for their client
- ❖ doing what is best for the firm
- ❖ doing what is best for other clients

Needless to say, these demands may not always be reconcilable. According to respondents, a core practice for managing these tensions is the holding of weekly meetings of all the project managers to discuss the management of resources. Project managers meet face to face and they have to argue their case against the other project managers. As one project manager adopts one role, the others play devil's advocate by adopting other roles and emphasizing other priorities and resource demands. Even with this practice, resource conflict remains and is a core part of the management of projects in this firm.

Finally, the recent appointment of a new chief executive in the American parent may change the nature of operational control. He has implemented a single measure of performance: the utilization of resources with the emphasis on rate realization and efficiency. Although it is too early to tell, this move may undermine all other efforts (in career management and project practices) if the company shifts its attention away from meeting clients needs and inwards towards resource efficiency. Small amounts of fat and redundancy are necessary for innovation to thrive and ideas borne of chance encounters to emerge (Foxall, 1984). People working in their spare time often generate the most spectacular results. In an environment where every minute must be accounted for, spare time is a thing of the past. Unless the company institutes effective practices for ensuring people have time and space to engage in innovative and creative problem-solving, the effort to increase client satisfaction through solutions which are meaningful and add value will surely be undermined. It might be argued here that governance is setting performance parameters, and delegating to responsibility to managers to implement them. However, the parameter relates to the use of inputs, and not the delivery of outputs, and so its effect is at an intrusive level. It suffers from the problems of scientific management. A respondent from another organization said of this approach:

> People are paid to do work, not produce results.

That was of course one of the main contributing factors to poor economic performance in Eastern European countries under the communist system.

Illustration 4: Telecommunications Network Operator and Service Provider

Our final illustration is one of the UK's largest companies. When it was privatized in 1984, all operations were conducted by geographically-based divisions. During the late 1980s, the adoption of Total Quality Management led to customer focus, and a realization

that the organizational structure was internally, not customer, focused. It was therefore changed in the early 1990s, through a project called Project Sovereign. In the new organization, there are divisions providing technical services to internal and external customers; the back office providing information systems and maintenance and support services. There are also the operating divisions operating the network, and supplying telecommunications services to customers. In the early days, there were just three customer service divisions, supplying corporate customers, domestic customers and international customers. There are now 16 and growing, with corporate customers divided into small to medium, large and major organizations, domestic customers divided into nuclear families, people living alone and other market segments, and new customer groupings such as mobile customers, specialist numbers, etc. Through all of this, it has been necessary to maintain a stable back office. In order to stop the back office having to change every time the operating divisions reorganize and introduce new customer groupings, an interface has been created, called Customer Account Management. This interface procures services from the back office to deliver them to external customers and operating divisions. In this way one of the UK's largest companies, and one with a former history of hierarchical management, achieves versatility. It shields that part of the organization which can be organized into stable functions, (the back office undertaking input management), from those that must be versatile to respond to changing customer needs, (the operating divisions undertaking process and output management), by providing an interface, (undertaking client management).

Governance

In this section we report preliminary findings on aspects of the governance of an organization. The role of governance is outlined in Table 2. During our interviews we also found that different organizations adopted different approaches to governance for very similar reasons as in the case of operational control. In the firms interviewed, approaches to governance ranged from light, remote and empowering to almost Soviet-style central planning and monitoring. In the manufacturing and defence industries the latter approach was evident and in the engineering construction industry the former approach was found. There may be many reasons why this difference exists. For example, manufacturing firms have traditionally applied very tight governance, because:

- ❖ the nature of the product lends itself to close scrutiny and production engineering
- ❖ companies have traditionally operated according to classical management doctrine
- ❖ production is carried out under the close supervision of management

In contrast, the engineering construction industry is characterized by:

- ❖ production on a larger scale and production which is less predictable
- ❖ companies which have traditionally not applied classical management doctrine
- ❖ work carried out in remote geographical areas demanding decentralization of decision-making to managers on site

ABB was unusual as a manufacturing company that applied an empowering stance to the governance of its local companies. We attribute this to the philosophical approach of the chief executive, which our respondents argue is a key influence on the culture of the company as a whole. Furthermore, the ABB organization reflects an empowering governance style. Operating companies are required to report profits to the head office in Zurich and their strategies for future business to the relevant business head office. A system of expenditure approval exists whereby managers have to justify the risk exposure but when the project is approved, they operate independently and without interference. A similar system of expenditure approval exists in most organizations we have spoken to. Unisys in Vienna said they found the risk reviews helpful. ABB in Vienna told us that the way of reporting strategy to the business head office varied from business to business depending on the nature of the business. In the versatile project-based environment such empowerment is necessary to allow firms to respond rapidly to rapidly changing market opportunities and threats.

In contrast to ABB, those companies with American parents, especially from the manufacturing and defence industries, reveal a more traditional and centralized governance structure where diversity in local company behaviour is less tolerated and central planning more pervasive.

While the ABB system of reporting illustrates governance with a high degree of trust, the reporting procedure is designed to minimize surprises. For example, input management, process management and output management make separate reports on project performance and the three have to tally. If a manager tries to distort his reports to disguise poor performance, he will be found out, and if he is found out he will be punished. This is similar to the apparent contradiction that parents who set the strongest guidelines on behaviour for their children are often the parents who can grant their children most freedom on a day-to-day basis.

Human Resource Management Policy

In our study, we have also investigated areas of human resource management policy, including:

- careers
- individual learning and development
- organizational learning
- leadership

This area is to be the subject of a separate paper (Keegan *et al*., 1999). However, we would like to summarize some key points, especially as they relate to operational control and governance.

Careers and Individual Learning

In the days of hierarchical, line management, people's careers progressed up the hierarchy and into line management. They climbed the ladder, up the chimney stack or silo that was the function. As they climbed the ladder of line management, they were rewarded according to the size of the budget they managed, or their number of subordinates, or both. Unfortunately, this often resulted in the Peter Principle, where good technical managers were promoted into bad administrators (Peter and Hull, 1969). In many of the project-oriented organizations we spoke to careers do not follow this model. Careers follow a spiral staircase, in which:

1. People can progress in all of the four main activities we identify as core activities including input, process, output and client managers, as well as in governance
2. As people progress, they can move between different areas of operational control, and between operational control and governance, to gain wide experience of how the organization operates
3. People are rewarded according to the amount of risk they manage, their ability to add value, and their contribution to profits

The line manager of the department may well manage someone who is a higher grade due to the latter's level of technical expertise and risk management. For example, we spoke to line managers in both Ericsson and ABB Lummus Global who had people in their departments who were two grades higher.

As an individual progresses up the spiral staircase, they gain experience of how the organization operates. In many organizations this process was carefully managed, to ensure individuals got the right learning experiences. In ABB Lummus Global, an individual's learning needs could take precedence over the needs of a project, with them being moved as the right learning opportunity became available.

All the organizations view mentoring and coaching as an essential part of the development of managers. This can be achieved through 'sitting next to Nellie' a 'master – apprentice' relationship. However, one of our organizations is so young and in such a fast moving environment that there are no Nellies. To cope with this and to ensure knowledge developed is captured, even in the absence of Nellies, the firm deliberately pairs people on jobs in order that they may learn from each other. One can see this as the creation of Nellies.

Organizational Learning

All the companies we interviewed recognized learning as a key issue. However, it is an area of management that is not well addressed. It remains an open question and an ongoing struggle for all of our firms. Practices found to facilitate the development of organizational learning include post completion audits, the use of INTRANETS, start-up workshops, and job rotation. However, at the end of the day, all the techniques used were ad hoc.

Leadership

Our data contains some insights on the issue of leadership in project based firms. At ABB Lummus Global we got a clear view of what it means to be a leader. According to one respondent, leaders must:

> Communicate the goal, communicate the process.

The leader in ABB must develop and communicate a clear vision for the project and combine the talents and skills needed to deliver the project. The data also reveals national differences in perception as to what constitutes effective leadership. This was overtly mentioned in our interviews in The Netherlands. In Holland, and to an extent in England, a good leader is one who earns the right to lead by earning the respect of those being led. Hence the agreement of those being led is a key to effective leadership. Our data also suggests that in the US, Germany and Switzerland there is much more of an expectation that once a manager has achieved a level of status and position in the hierarchy, this is sufficient for them to lead. Subordinates will be much more compliant in respecting that status of position.

> Salute the uniform, not the person.

This requires further exploration as others, including Covey (1992), argue that even in the US managers have to earn the right to lead by clearly communicating their vision and values, and not expect to earn the automatic right from their status and position.

Conclusions

Process-based management has been adopted as an alternative to functional hierarchical line management and traditional project management, because the former is not seen as being able to respond to the modern changing environment, and the latter repeats many of the mistakes of the former. Our research has

shown that rather than adopting linear process chains, managers need to recognize that organizations are essentially multi-dimensional, with:

- ❖ the hierarchy linked to governance
- ❖ different models for operational control and governance
- ❖ four elements of operational control, managing clients, inputs, processes and outputs

People's career development ideally will give them exposure to all four elements of operational control, and perhaps also governance. As a result they will progress up a spiral staircase. People should also be rewarded according to how much risk they manage, which means a technical manager may earn more than the head of his or her department.

And so, from our research we see organizations are able to pursue different models of operational control and governance, which enable them to achieve some of the benefits of classical management while giving them customer focus and flexibility.

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J. RODNEY TURNER, *Erasmus University, Rotterdam, Room H15-2, P.O. Box 1738, Burgmeester Oudlaan 50, 3000 DR Rotterdam, The Netherlands.*

Rodney Turner is Professor of Project Management at Erasmus University, Rotterdam, in the Faculty of Economics. He is the author of four books on project management, including the best-selling The Handbook of Project-based Management *published by McGraw-Hill. He is also editor of* The International Journal of Project Management, *and, for 1999 and 2000 he will be President of the International Project Management Association, the global federation of national associations in project management.*

ANNE KEEGAN, *Erasmus University, Rotterdam, Room H15-2, P.O. Box 1738, Burgmeester Oudlaan 50, 3000 DR Rotterdam, The Netherlands.*

Anne Keegan is currently Post-Doctoral Researcher at RIBES, (the Rotterdam Institute for Business and Economic Studies), and a member of the Faculty of Economics at Erasmus University. Her research is in HRM and organizational theory, concentrating on project-based firms, knowledge-intensive firms and professional firms. Her doctorate was on the topic of management practices in knowledge-intensive firms.