The role of project capability in strategic change: towards a resource-based perspective

Andrew Davies*, Tim Brady and Michael Hobday

May 2004

Paper submitted to 20th EGOS Colloquium July 1-3, 2004
Ljubljana University, Slovenia

Sub-Theme: The role of projects and project organisational arrangements in organisational development

*Corresponding author:
Deputy Director
Complex Product Systems Innovation Centre
The Freeman Centre
SPRU University of Sussex
Brighton BN1 9QE

A.C.Davies@sussex.ac.uk
Tel: +44 1273 877107
Introduction

This paper draws upon resource-based theories of the firm (Penrose 1959; Nelson and Winter 1982; Teece and Pisano 1994) to develop a framework for analysing how firms use projects to achieve their strategic objectives. Penrose (1959) argued that a firm’s resources and knowledge related to the use of certain technologies or exploitation of markets creates a ‘base’ from which to move into new technology or market positions. Subsequent research using a resource-based approach has emphasised that ‘organisational capabilities’ are critical to a firm’s ability to use resources to grow and compete successfully in rapidly changing technologies and markets (Richardson 1972; Wernerfelt 1984; Chandler 1990; Teece and Pisano 1994; Teece et al. 1997; Grant 1991).

Although a few studies have identified the role of ‘project execution capability’ in late industrialising countries (Amsden and Hikino 1994), ‘multi-project management capabilities’ in new product development (Cusumano and Nobeoka 1998), and ‘project capability’ in capital goods (Davies and Brady 2000), the growing body of literature on the resource-based view of the firm has largely ignored the project as an organisational capability and source of competitive advantage. In contrast to the traditional emphasis on resources and capabilities inside the firm, the concept of project capability draws attention to temporary forms of organisation that make use of resources that are both internal and external to the firm. Projects are established as internal organisations to meet a firm’s strategic objectives, such as technology research, new product development and process improvements. But they are often set up as collaborative forms of organisations with suppliers and customers that cut across the traditional boundary between the firm and its external environment.

This paper suggests that the concept of project capability helps us to analyse how firms use projects to (1) perform a growing range of research, development and implementation activities in their traditional base business, and (2) as a vehicle to explore moves into new technology or market positions. It argues that ‘base-moving’ projects can be a successful way of investigating or responding to new technological imperatives or market opportunities. The paper is divided into three main parts. Part 1 discusses Penrose’s analysis of the resource-

---

1 The paper is based on chapter 3 ‘Firm strategy and project capability’ in Davies and Hobday (2005).
based view of the firm and identifies the role of organisational capabilities as a source of competitive advantage for the firm. Part 2 argues that the additional concept of project capability is required to identify a growing proportion of the activities undertaken by firms. Part 3 considers how project capabilities are used by firms to support their strategies to move into new technology or market bases.

Part 1: The organisational capabilities of the firm

In *The Theory of the Growth of the Firm* (1959), Penrose laid the foundations for the modern analysis of the resource-based view of firm strategy and organisation. Penrose defined the firm as an administrative organisation and a pool of productive resources. Her analysis depends on the distinction between resources and services (Penrose 1959: 25). Firms use of two types of resources to produce and sell products and services: physical resources (tangible assets such as raw materials, plant and equipment) and human resources (intangible assets such as financial, managerial or technical knowledge and skills). Resources are a bundle of ‘potential services’ that are defined independently of their use. Services refer to the productive ‘activities’ or ‘functions’ involved in making use of firm-specific resources. However, the products and services produced by a firm at a given time are merely one among several ways in which a firm could use its resources. The internal resources of a firm are rarely fully utilised in the process of production. They consist of a bundle of potential services that can be used in a variety of different ways.

The existence of this pool of ‘unused productive services’ provides a powerful inducement for a firm to search for ways of using its existing resources more fully. Therefore, a firm’s unused services are a challenge to innovate and an opportunity to expand into new technology or markets. A firm is able to innovate by introducing ‘new combinations’ of resources and productive services, such as the development of new products, new production processes, and new forms of organisation (Penrose 1959: 85-6).

1.1 The resource base: technologies and markets

Penrose’s central argument is that the long-term competitiveness of the firm does not depend so much on the efficiency with which it can use its resources to produce a diversified range of
products in large volumes at low unit costs, but on its ability to use its resources to grow and diversify into new technology and market bases. By developing a strong ‘base’ of resources in the use of certain technologies and exploitation of different types of markets, a firm can ‘adapt and extend its operations in an uncertain, changing and competitive world’ (Penrose 1959: 137). The growth and diversification of the firm is fuelled by the dynamic interaction between its technological and market bases.

A firm develops its ‘technology base’ by specialising in certain fields of technology. Penrose used the term ‘productive base’ interchangeably with technology base because a firm must develop the resources and knowledge to perform complementary activities related to a particular technology as it flows from research, through product development to physical production. When a firm moves into a new technology base, it must develop resources and knowledge in a different and often rapidly changing area of technology.

A firm develops its ‘market base’ by exploiting certain types of markets. A range of market-base activities are undertaken, such as sales and marketing, developing proposals, and organising the installation and maintenance of equipment. Markets are classified into the different groups or types of customers served. Resources and knowledge are developed over time to meet the needs of different groups of customers or to provide existing customers with new combinations of products and services. Movement into a new market position requires the allocation of resources ‘to the development of a new type of selling programme and a competence in meeting a different type of competitive pressure’ (Penrose 1959: 110).

1.2 Organisational capabilities

In the large body of literature informed by a resourced-based view of the firm, the term ‘capability’ is now used to refer to the knowledge and experience of a firm’s management and personnel. Acknowledging the importance of Penrose’s contribution, Richardson (1972) was among the first to argue that firms gain competitive advantage by developing the ‘distinctive capabilities’ – knowledge, experience, skills and organisation – to perform specialised productive activities, such as research, development, production or marketing. A firm’s capability is distinctive or ‘core’ when it provides a unique source of competitive advantage, which is not widely available to other firms in an industry (Kay 1993; Prahalad
A core capability is difficult to imitate and uses scarce resources that cannot simultaneously be implemented by large numbers of firms (Barney 1991).

Because resources alone do not create value, a firm must develop the ‘organisational capabilities’ required to leverage a firm’s pool of resources and perform activities that create competitive advantage (Grant 2002: 139). For example, a firm’s designers, engineers, labs and manufacturing plant are of little use on their own. It is how they are combined or organised – such as in strategic units, functional departments and cross-functional teams – to provide the capability required to produce new generations of products and perform processes that create added value.

The development of a firm’s internal capabilities is closely related to changes in its external technological and market environment and assumptions about this relationship between a internal capabilities and the environment have influenced the progress of research in this field (Nelson 1991). The greater the rate of change in a firm’s external environment, the more important its internal resources and breadth of capabilities are to the long term success of a firm (Grant 2002: 135). In Penrose’s (1959) original study, the influence of the environment was ‘put on one side in order to permit concentration on the internal resources of the firm’ (Penrose 1995: xiii).3 Research on the resource base of the firm undertaken since the 1980s and 1990s has focused explicitly on the dynamic interplay between the firm’s internal capabilities and changing external conditions, recognising that learning is the main way in which organisations interact with, and are changed by, their environment (Teece and Pisano 1994).

However, firms can develop the capabilities to perform successfully in existing technology and market bases without developing the capabilities to gain and maintain their competitive advantage in a changing environment. Nelson and Winter (1982) argue that a firm’s knowledge and experience resides in its memory, which is located in its routines.

---

3 Some competitive advantages, however, are based not on a firm’s distinctive capabilities, but on their market dominance, which Kay calls ‘strategic assets’ such as natural monopoly, sunk costs, government protection or network externalities (Kay, pp113-124, 1993).

3 In her defence, Penrose (1995) writes that the ‘relevant environment...is different for every firm and depends on its specific collection of human and other resources. Moreover, the environment is not something “out there”, fixed and immutable, but can itself be manipulated by the firm to serve its own purposes’ (Penrose, xiii, 1995).
Organisational routines, which refer to the repetitive and predictable patterns of activities involved in productive activities, form the basis of a firm’s organisational capability (Grant 2002: 148). A reliance on routines is a strength for companies operating in traditional technologies and markets under stable conditions. However, difficulties occur when organisations continue to follow established routines in a changed environment. During the growth of a firm, capabilities which are effective for existing technologies and market bases may be experienced as ‘core rigidities’ (Leonard-Barton 1992; Leonard 1995) or ‘organisational inertia’ (Iansiti 1998), as a firm expands to meet new opportunities.

The ability of a firm to adapt to a changing environment depends in part on a capability called ‘absorptive capacity’. Largely a function of a firm’s prior knowledge and experience, absorptive capacity refers to the ability to recognise the value of new, external knowledge and information, assimilate it and apply it to meet new market objectives (Cohen and Levinthal 1990). Because the development of absorptive capacity is path dependent and cumulative, lack of investment early on in a new area of knowledge and expertise may foreclose the future development of capabilities in that area. Several authors have emphasised the need for managers to identify, sustain and build their capabilities so that a firm is able to adapt to and shape its technology or market environment. The concept of a firm’s ‘core’ competence is used to refer to a firm’s primary technology or market base and to show how a firm may have over-stretched itself in terms of efficient and profitable management and should re-focus on its core (Hamel and Prahalad 1994). Radical changes in the environment can force a firm into totally renewing its capabilities. Many new forms of competitive advantage in fast changing environments stem from ‘dynamic capabilities’ (Teece and Pisano 1994; Teece et al. 1997). The term ‘dynamic’ refers to the firm’s ability to adapt, reconfigure and renew its capabilities, to create innovative responses to a changing technology or market environment, and to grow into new technology or market positions along paths shaped by their traditional resources and capabilities.

1.3 Strategic, functional and cross-functional capabilities

In recent resource-based literature, capabilities are treated as vital assets that permeate all levels and all functions in an organisation. Chandler (1990) identifies the strategic and functional capabilities required to compete successfully in all types of industries. Strategic
capabilities refer to a firm’s ability to move into new technologies or markets more quickly, and out of declining ones more rapidly and effectively, than its competitors. Strategic management is responsible for allocating resources and implementing long-term plans to maintain, renew and expand a firm’s organisational capabilities (Chandler 1990: 594). The task of top management is to create flexibility for action by effectively monitoring internal operations and adjusting strategies to a changing environment. Functional capabilities are required to improve a firm’s R&D, product design, production, distribution, purchasing, finance and general management. Middle managers develop and apply functional-specific and product-specific managerial skills, and co-ordinate, integrate and evaluate the work of the functional departments. Functional departments represent silos of knowledge – in areas such as design, engineering, logistics, procurement and manufacturing – which are essential for the preservation and perpetuation of a firm’s functional skills and expertise.

Strategic and functional capabilities provide the internal dynamic for the continuing growth and competitiveness of the firm. Once a firm has established a basic position by developing its knowledge of new technologies or markets, Chandler shows that its subsequent growth, profitability and survival depends on its ability to produce a variety of products in increasingly large volumes. His framework explains how companies grow by: (1) obtaining economies of scale and scope in the production of a variety of products; (2) creating a marketing and distribution network so that the volume of sales matches the volume of production; and (3) establishing a management structure to co-ordinate functional activities and to strategically plan and allocate resources for future production (Chandler 1990: 8). Firms that produce new or improved products and use new or improved processes gain ‘first-mover’ competitive advantages (Chandler 1990: 34-35). First movers are leaders in exploiting cost advantages of scale and scope economies and have a head start in developing functional capabilities. First movers are able to move down the learning curve in each of the functional activities before the challengers go into operation.

Unlike Chandler, however, the a firm’s capability is often defined at the strategic level only.\

From this top-down perspective, it is difficult to identify the growth, adaptation and learning

---

4 For example, while recognising that competence is embedded at all levels and in all functions in an organisation, Prahalad (1993) stresses that it is the top-down responsibility of strategic management to build shared values at all levels in an organisation, to manage linkages across business units, and to develop strategies for acquiring capabilities.
that takes place at lower levels in organisations. Leonard-Barton (1992: 17) argues if a
capability is defined as one that provides competitive advantage then such capabilities may
reside at the divisional, functional or other levels, such as temporary project organisations.\(^5\)
Carlsson and Eliasson (1994) attempt to extend Chandler’s approach to examine the
hierarchy of capabilities within a divisionalised firm, including the ‘technical functions’ at
the bottom of the pyramid which have to be co-ordinated by middle managers.

In the 1990s, many firms began to develop the cross-functional capabilities required to
compete successfully in rapidly changing environments by leveraging resources located in
the firm’s separate functional organisations, including departments, units and divisions
(Prahalad 1993; Leonard 1995). In cross-functional product development teams, for example,
designers, engineers, managers and other personnel have to working across functional unit
boundaries are responsible for integrating strategic planning, R&D, marketing, manufacture
and finance capabilities.

**Part 2: Project capability and the base of the firm**

The literature on organisational capabilities provides the foundation of the modern analysis of
the competitive advantage of the firm (Grant 2002). With few exceptions (Amsden and
Hikino 1994; Cusumano and Nobeoka 1998; Davies and Brady 2000), however, an important
capability ignored by much of the previous research using a resource-based analysis is the
managerial and organisational knowledge and experience required to win bids and to
successfully execute projects. Building on Penrose’s research, we now argue that ‘project
capability’ is increasingly important source of competitive advantage for the firm. In this part
we examine the nature and scope of project activities that firms perform in their existing
technology and market bases.

In contrast to the emphasis the resource-based literature on capabilities and resources that are
internal to the firm, project capabilities draw attention to temporary forms of collaboration
that cut across the traditional boundary between the firm and its external environment
(DeFillippi and Arthur 1998; Gann and Salter 2000; Grabher 2002). This temporary and

\(^5\) While not specifically concerned with capabilities, Mintzberg (1983) was among the first scholars to stress the
importance of top-down, middle and bottom-up management within organisations.
flexible organisation provides a highly effective way integrating resources from inside and outside the firm for a finite duration. In this way, firms can exercise control through the networks of external relationships they have with subcontractors, customers and other suppliers, as much as through traditional forms of internal managerial coordination, ownership and vertical integration. Figure 1 illustrates the position of project capabilities within the overall set of organisational capabilities that contribute to competitive advantage.

![Diagram](image)

*Figure 1: Resources and organisational capabilities*

### 2.1 Project activities

Project capabilities create value for external customers and internal clients by performing activities through the life cycle of a project, from initial customer engagement or request, through the bid and proposal phase to project implementation. A project is an organisational unit established to attain a specific goal by completing a project (often a product and service) on time, within budget, and in conformance with predetermined performance specifications (Gaddis 1960: 89). These project activities include: (1) engaging with external customers, preparing proposals or bids, and developing offers for strategic partners or internal clients; and (2) setting up a project organisation and managing the life cycle of activities involved in project execution, hand-over to the customer, and ongoing support (see Table 1).
Bid activities | Project activities
---|---
- setting up and managing a bid team or programme of bids | - setting up and managing a project or programme of projects
- requirements gathering (extracted from customer documents) after receiving an invitation to tender from a customer | - integrating functional and project resources
- conceptual design specifying components in the proposed system | - purchasing resources inside and outside the firm
- estimation of costs, taking into account many factors (e.g. the quality, reliability and cost of components sourced internally and externally) | - managing and reallocating resources through the project life cycle using milestones and deadlines
- defining levels of service | - working on a team basis
- risk management | - using a number of project management tools, computerised techniques and concepts - e.g. concurrent engineering, Milestone scheduling and PERT (Program Evaluation and Review Technique)
- scheduling of project activities | - preparing the bid document (including contractual agreements) by integrating information determined in the previous steps
- selection of subcontractors | 

Table 1: Project capabilities

Bid managers are responsible for managing the bid team and preparing a successful proposal. Productivity improvements in the bid phase can be obtained by shorter bid-preparation times and an improved quality of submitted bids, which help to increase a firm’s market share. However, if the customer is a strategic partner, the proposal team make an ‘offer’ rather than a bid, thus avoiding the necessity of engaging in costly and time-consuming competitive bids. Project managers are responsible for managing the completion of projects within cost, on schedule and to specific technical standards. Effective management of the front end of a project leads to better overall designs and improved productivity during later stages of implementation (Morris 1994). Members of bid or project teams can participate in more than one project by dividing their time among different bids or projects.

2.2 Types of projects: research, development and implementation

Projects undertaken by firms can be related to the distinct phases of the innovation process: research, development and production (see Figure 2). Three different types of projects are set up to conduct research in existing and new fields of technology; to develop technologies into
products; and to produce complex capital goods and services as one-offs or in small batches to meet the specific requirements of internal or external customers.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Product/Service</th>
<th>Production/Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESEARCH</td>
<td>DEVELOPMENT</td>
<td>CONTINUOUS PROCESS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MASS PRODUCTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LARGE BATCH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UNIT &amp; SMALL BATCH</td>
</tr>
</tbody>
</table>

- Volume activity
- Project activity

**Figure 2: Projects and the innovation process**

Research projects explore the possibilities of existing or new fields of technology. Development projects adapt a stable technology (the output of research) to the requirements of the market by creating products and services that can be produced profitably (e.g. Iansiti 1995 & 1998; Kusunoki et al.1998). Development activities concentrate on achieving ‘design freeze’ prior to production and market introduction. New product development (NPD) projects are responsible for the redesign of components and product architectures to improve existing products or develop new generations of products.

Improvements in the performance of development projects has been linked to the use of project-based organisations to coordinate interdependent tasks and to promote cross-functional interactions (Clark and Fujimoto 1991; Iansiti 1998: 14). In a shift away from the development of isolated products, ‘multi-project management capabilities’ enable firms to leverage core common components and design knowledge across a coordinated stream of new products, permitting reductions in development and production costs (Cusumano and
Nobeoka 1998). Nokia’s new product design process, for example, requires people with different skills (e.g. handset design, wireless engineering, multimedia applications, manufacturing and finance) to work together on each new mobile handset design project. When a new handset model is designed and goes into production, the project is finished and the team is disbanded, its members move on to participate in other development projects. This circulation of people from project-to-project fosters cross-functional learning and knowledge transfer between different parts of the firm.

In most industries, the output of R&D, such as a product prototype, is the input to a production process undertaken in high volumes – large batch, mass production or continuous process – for the market. As shown in the Figure 2, the capital goods sector is the only industry in Woodward’s (1965) classification of production systems to carry out its primary productive activities as well as R&D on a project basis. What we call ‘implementation projects’ refer to the activities involved from obtaining a customer’s order to the design and integration of components and subsystems in the finished product or system.

The innovation process in capital goods can be partitioned into distinct phases of a linear process flowing from research, through product development to implementation activities. Ericsson, for example, undertakes three distinct types of project including: (1) research projects to develop and improve each generation of mobile communications systems technology; (2) development projects with lead customers to create new and modified products (e.g. radio base stations and mobile switches) for each generation of mobile system; and (3) implementation projects using mature product technology to design, integrate and build mobile networks for its customers throughout the world.

The partitioning of innovation into distinct phases is, however, difficult to apply in capital goods projects at the one-off or very-low-volume end of the productive spectrum, which involve the creation or first use of new technology. To meet a customer’s requirements for such technologically advanced products, research, development and implementation activities

---

6 Some firms involved in production on a one-off basis supply technically ‘simple’ products such as bespoke suits. Other firms provide ‘complex’ products such as radio transmitting stations (Woodward 1965, p.37).

7 High-volume producers, such as car manufacturers, may also meet their internal requirements for capital goods by undertaking one-off productive projects to install equipment (e.g. IT, telecoms and factory automation systems).
are undertaken concurrently within the scope of a single project. For example, the UK’s National Air Traffic Services (NATS) project for the new Swanwick air traffic control centre involved the development and first application of technology for a particular customer, which according to NATS ‘was more advanced than anything that is being tried anywhere in the world’ (House of Commons 1998: viii).

2.3 Project versus functional efficiency

Project capabilities are particularly important in the design and production of complex capital goods in low volumes to meet specific customer requirements. Such as aircraft and telecommunications networks. Davies and Brady (2000) argue that Chandlerian scale and scope economies based on functional capabilities are difficult to obtain in complex capital goods because production is limited to unit or small, tailored batches. Traditionally, functional departments had been established in large batch, mass production and continuous process industries to carry out the routine tasks involved in maintaining a high-volume of throughput of standardised products and services (Woodward 1965). Faced with the challenge of developing advanced aerospace and military systems during and after the Second World War, several US manufacturers – such as Lockheed, General Dynamics and Boeing – soon recognised the limitations of using functional organisations to accomplish complex and novel tasks (Johnson 1997). These firms were among the first to establish project management organisations to handle special assignments such as new product development, building a factory and investigating moves away from their traditional base business (Gaddis 1960; Middleton 1967: 73).

Several alternative types project-based organisations can be distinguished from traditional functional organisations, ranging from a total project to a matrix organisation (Marquis 1969: 29). Whereas functional organisations group people together on a more or less permanent basis in a specialised unit to perform recurring and repetitive activities, in temporary project organisations people stay together for as long as it takes to complete a particular episodic activity (Lundin and Söderholm 1995). A total project organisation is one in which all functions and personnel required to accomplish the project work in a dedicated team and report directly to the project manager rather than the line manager in a functional
department. The total project organisation was adopted to overcome functional weaknesses that could impair the successful completion of a project (Middleton 1967). The matrix form was pioneered by US aerospace manufacturers in the late 1950s to provide a more efficient way of integrating the project and functional resources involved in delivering a large number of complex projects (Galbraith 1973; Knight 1976; Davis and Lawrence 1977: 3). Some primary functions and personnel are transferred from functional departments to the project. The project manager brings together and directs the functions and resources required for successful completion of the project. The two main types of project organisation can be located on a modified version of Galbraith’s (1973) continuum of organisational forms (see Figure 3).

![Diagram](image-url)

**Figure 3: The range of organisational forms (adapted from Galbraith 1973: 114)**

Increases in product complexity, task novelty and customisation exert pressures to move a firm towards a total project organisation (Galbraith 1973: 116). Increases in product

---

8 In the traditional functional organisation, by contrast, specialists are located in one department (e.g. R&D, design, engineering, procurement, manufacturing and sales) and report to a functional manager. Functional departments are integrated into the organisation in different ways: some have ‘staff’ and others have ‘line’ authority.

9 Matrix replaces the traditional single chain of command of functional or total project organisations with two-dimensional reporting structures. Each member of the matrix organisation reports to two bosses (the functional specialist and project manager) and is associated with two groups: the functional unit composed of fellow specialists and the team of co-workers in the diverse specialities required for a single project (Lawrence and Lorsch 1967: 221).

10 While Galbraith’s diagram refers to the product vs. function choice along a continuum, he explicitly recognises as well that ‘It could be project-function’ (Galbraith 1973: 113).
standardisation, functional specialisation and economies of scale or scope exert pressures to move a firm towards a functional organisation. A matrix organisation is required if opposing forces are equally strong. Firms often create different types of organisation for various phases in the project life cycle by establishing a total project organisation during the proposal stage, a matrix organisation during project implementation, and upon delivery of the product shift to a functional organisation to provide operational support and maintenance.

Part 3: Project capabilities and strategic change

In addition to the range of organisational capabilities identified in the literature on the resource-based view of the firm, we have argued that project capability is becoming a core area of knowledge and experience that firms are developing to perform a growing proportion of their existing technology and market-based activities. In this part, we consider the different ways in which firms use project capabilities to achieve strategic objectives to move into new technology and market positions.

3.1 Base-moving projects and firm strategy

Each firm develops a set of core project capabilities over time to exploit existing technology or market bases. These capabilities are embodied in company-specific bid documentation and project management manuals, which contain detailed instructions about how to win bids and execute projects. Standardised project management processes and organisations are often used to carry out research in an existing technological field, develop products and services based on known technology, and configure them to meet the requirements of its traditional customer base. Projects undertaken to meet the relatively stable technological and market requirements emphasise the need for incremental technological improvements, increasing the efficiency of bids and projects, and strengthening existing customer relationships.

When a firm moves into a new technology or attacks a new market space, its project capabilities may have to be revised or even abandoned as a firm builds the new resources and capabilities required to perform a radically different type of project-based activity. Building on Penrose (1959: 50) original insight, we argue that firms often establish projects to implement offensive or defensive base-moving strategies. Offensive moves are deliberate
efforts to open new frontiers of research or explore new market opportunities. Defensive moves refer to the ways in which firms adjust to their changing environment, such as developing new products to protect a market position against competitive forces of product obsolescence or shifts in customer demands. External changes of this kind can be so important that they encourage a firm to implement defensive strategies to keep pace with the frontiers of research or even lead the introduction of innovations.

The pursuit of either type of strategy requires resources and managerial services to be released from current operations and placed in specialised ‘base-moving’ projects. These are units in an organisation in which ‘planning and expansion at all levels are in the hands of personnel largely free from operating duties and more or less continuously occupied with planning’ (Penrose 1959: 50). They range from individual projects to large programmes:

‘Small projects are constantly being created and executed, some of which are never considered in the higher reaches of management... Whole departments may be devoted exclusively to research into new products, new methods, new uses for old products, and new markets, envisaging the possibility that the firm might expand in new directions’ (Penrose 1959: 50).

Offensive base-moving projects are created to take the lead in the development of new technology or to create first mover advantages in new markets. Defensive base-moving projects are set up to respond to a rapidly changing technology and market environment. For example, Boeing has until recently maintained an impregnable position in the world civil aviation market by pursuing an offensive strategy of creating successive generations of commercial airliners incorporating major technological advances. Its largest and riskiest project was the development of the 747 jumbo jet. However, Boeing has recently followed a new defensive strategy by redirecting its resources away from risky investments in new civil markets towards projects for the US military involving less financial risk.

Base-moving efforts can result from a top-down strategy beginning with the establishment of a major project or from numerous unplanned bottom-up small-scale project initiatives. In many cases, initial moves begin with a strategic decision to create a major pioneering project, which is able to mobilise the large-scale resources needed to support a move into a new technology or market position. For example, Lockheed Martin established its ‘skunk works’
as a separate organisation to carry out super-high-tech projects, such as the U-2 spy plane (Rich and Janos 1994). Base-moving projects of this kind operate at a distance from the firm’s traditional organisation to provide the project group with the autonomy needed to develop new functional, cross-functional and project capabilities required to master the new technological or market opportunities, whilst minimising the risks of such moves. These projects can represent the beginning of a far-reaching transformation in the strategic direction of the firm as a whole.

Alternatively, moves into new directions and ‘frame-breaking investments’ to promote corporate renewal can start out as smaller projects and seed-bed initiatives scattered throughout an organisation, each requiring only limited resources (Baden-Fuller and Stopford 1999: 17). Over time, these projects initiatives may become supplemented by larger base-moving projects that cross functional divides and make more systematic use of corporate-wide resources. The larger projects supplement the numerous smaller initiatives and collectively enable the firm to consolidate its position in a new technology or market base. The strategic choices and base-moving project initiatives that a firm may follow are illustrated in Figure 4.

![Figure 1: Strategies and project initiatives](image-url)
3.2 Base-moving paths: some illustrative examples

A firm can establish a project to initiate a strategic move beyond its existing technology and market bases by following one of the three paths of diversification identified by Penrose (1959: 110). The paths (shown in Figure 5) refer to:

1. the entry into new markets with new products based in a new technology base;
2. entry into a new market base with new products using an existing technology base;
3. expansion in an existing market with new products based in a new technology base.

The strategic role played by such base-moving projects can be illustrated by some examples of Ericsson’s diversification beyond its traditional base over the past three decades. Ericsson has changed the focus of its activities and strategy from manufacturing fixed telecommunications equipment for public telecommunications operators to become the world’s leading supplier of mobile communications systems for a new set of customers – mobile phone operators. These examples are illustrative only and further systematic data is required to enable a comprehensive testing of the phenomenon of base-moving growth through projects.

Figure 2: Base-moving project paths

---

11 Diversification within a firm’s traditional base refers to ‘the production of more products based in the same technology and sold in the firm’s existing markets’ (Penrose 1959: 110).
Path 1: Business-moving projects

The most radical base-moving path firms can follow is to create projects for ‘investigating departures from their traditional business’ (Middleton 1967: 73) by successfully expanding into a new technology and new market base.

In the 1970s, for example, Ericsson combined its radically improved digital switching technology based on the AXE exchange with radio transmission technologies to enable its diversification from fixed telephony into the emerging mobile telephone markets in the early 1980s (Granstrand and Sjölander 1990: 44; Granstrand et al. 1997: 14). The AXE exchange formed the core mobile switching component used to connect radio base stations in the Nordic Mobile Telephone (NMT) network, creating a joint international mobile phone service for Sweden, Norway, Denmark and Finland (Meurling and Jeans 1985: 151).

Ericsson participated in NMT system development, laboratory studies, and field trials conducted during the 1970s. However, its successful move into mobile telephony was not the result of a planned top-down or offensive strategy (Mölleryd 1997). Instead it was made possible by two pioneering base-moving projects, which mobilised the entrepreneurial resources needed to respond to and act upon new technological and market opportunities in mobile telephony. Ericsson was selected in 1978 as one of the equipment manufacturers responsible for developing mobile switching and base station technology and delivering equipment for the NMT system in a project consortium managed by the participating Scandinavian telephone operators. Ericsson’s AXE exchange technology had to be adapted to the requirements of mobile telephony. In 1979 Ericsson won another project contract to build a mobile phone network using NMT technology in Saudi Arabia. The world’s first commercial mobile network opened for service in Saudi Arabia on 1 September 1981 followed closely by the Nordic NMT network which was inaugurated on 1 October 1981.

These pioneering projects brought together resources from two previously unrelated parts of Ericsson: the Public Systems Division responsible for AXE technology and the radio communications subsidiary called SRA. During 1981, these two organisations worked closely together to create the bidding capability within Ericsson to meet to the growing number of customer requests for project proposals to design and build mobile networks through out
Europe (Meurling and Jeans 1994: 57-58). In late 1981, Ericsson’s senior management team made a decision to combine its resources and capabilities in mobile telephone systems markets to create a single organisation which became Ericsson Radio Systems.

**Path 2: Market-moving projects**

A second base-moving path is to use an existing technology to offer new customers an existing range of products and services or to provide existing customers with new combinations of products and services.

In 1995, for example, Ericsson began to offer its existing mobile operator customers within Europe an increasing range of high-value added services together with its mature product offerings. At the time, Ericsson’s products used second generation (2G) technology based on the Global System of Mobile communications (GSM) standard. This technology was developed since the early 1980s to enable international roaming between EU countries and first introduced to the market in 1991. Ericsson continued to undertake development projects throughout the 1990s to refine and adapt GSM technology to the requirements of the rapidly evolving market. However, its base-moving efforts focused on expanding into new markets for existing customers: providing mobile phone operators with a new type of turnkey project to meet customer demands for major outsourcing contracts (Davies 1997b). Building on its traditional role as a supplier of equipment, Ericsson now had to perform many of the design, build, installation, operational other service-based activities previously handled in-house by its customers.

Ericsson’s first move into the new market for turnkey projects began in the UK in 1995 when it signed a contract to perform all the activities required to design and build a mobile network for One2One, the UK operator now owned by T-Mobile. This was a defensive strategy because the demand for the new type of project was initiated by the customer. But it was a major project initiative for Ericsson, bringing together resources from within the UK and other parts of corporate group as well as externally to form a separate project organisation, which received the top-down support from Ericsson’s senior management team. The project was soon supplemented by numerous other turnkey projects initiated in response to growing customer demand from the bottom-up within Ericsson’s various product divisions.
Ericsson’s expansion into this new market base was aided by the existence of a pool of inherited resources (Davies and Tang 2003a). In the mid-1990s, the provision of services, such as design and maintenance, was largely an invisible resource, provided for free to clinch the product sale. From 1995, however, many of Ericsson’s product units began to establish their own service organisations to support their growing turnkey activities by making better use of this largely unexploited resource base. In 1998, Ericsson took a strategic decision to shift into this new market base by placing its entire service resources and capabilities in a single corporate division, which became Ericsson Global Services, to provide new combinations of services and products as turnkey solutions.

**Path 3: Technology-moving projects**

Providing an existing customer base with new products which embody radical innovations in technology is the third path of expansion. To move into a new technological base, a firm has to undertake basic research to create a stable technology and product development to adapt the technology to the application context prior to market introduction. For example, the market introduction of Ericsson’s 3G mobile communications, which incorporate advances in internet protocol (IP) technologies to provide high-speed packet switching of data traffic, was preceded by around ten years of pre-market collaborative R&D (Gessler 2002). Ericsson’s efforts to commercialise 3G technology have focused on two major ‘First Office Application’ (FOA) projects in collaboration with Vodafone – one of Ericsson’s lead customers – to start 3G mobile services in the UK and Japanese markets (Davies and Tang 2003b). In these two projects, Ericsson and Vodafone have worked closely to prepare 3G technology for market introduction, to develop, test and conduct commercial trials of 3G products and applications, and to ensure backwards compatibility with 2G networks.

**Conclusions**

The large body of resource-based literature inspired by Penrose’s original study of firm growth has identified the organisational capabilities that underpin the competitive advantage of the firm. Whilst acknowledging the importance of these different capabilities to the successful growth of the firm, this paper argued that project capability is an increasingly
important but neglected organisational capability and source of competitive advantage for the firm. As well establishing projects to carry out a growing proportion of their research, development and productive activities, many firms use projects as a vehicle to explore opportunities to move into new technology or market positions, whilst minimising the risks of such moves. A project provides a highly effective way of meeting a firm's strategic objectives by flexibly combining and leveraging internal and external resources for the time it takes to finish a special assignment. Such capabilities are required to cultivate closer customer relationships, develop proposals or offers, win bids, and successfully execute projects that meet a customer's requirements. We developed Penrose's resource-base approach to examine how firms use establish projects to (1) perform a range of research, development and implementation activities in their existing technology and market bases, and (2) to investigate opportunities to diversify into new basic positions.

The concept of base-moving projects was introduced to show how firms use projects strategically for 'investigating departures from their traditional business' (Middleton 1967: 73). The knowledge and experience gained during a base-moving project helps senior management understand the viability of moving further into a new technology or market position. In other words, projects shape strategy as much as strategy shapes projects. Firms that pursue strategic paths of diversification must be prepared to adjust or renew their project capabilities as they move from their existing areas of specialisation into new technology or market bases. The paper outlined the variety of strategic approaches and project initiatives that are open to firms when following three different paths of expansion into new technology and/or market bases. Further research is needed to test the applicability of these different base-moving paths in other firms and industries. There is also a need to examine how firms build their project capabilities over time as they attempt to build strong positions in their new technology or market bases.
References


Davis, S.M. & Lawrence, P.R., (1977), Matrix, Addison-Wesley, Reading, Mass.


Galbraith, J. (1973), Designing complex organizations, Addison-Wesley, Reading, Mass.).


