

## Centre for Technology Management

*Constraints on the Growth of Technology-based  
Firms – Perceptions and Effects*

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## *Constraints on the Growth of Technology-based Firms – Perceptions and Effects*

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**ABSTRACT**

The failure of small firms to grow into large enterprises has been identified as a significant problem for the economy of the UK. This study examines the constraints facing IT firms in the Software and Computing Services sector in particular. Research was undertaken in the form of interviews examining firm attributes and reported constraints. No clear patterns emerged linking specific constraints with patterns of growth, but the importance of effective management was a common theme. Apparent anomalies in the responses at interview direct attention to the important and interesting question of the extent to which the “constraints” on firms’ growth are determined by entrepreneurs’ perceptions and interpretations of their firms and the environments within which they operate.

## 1 INTRODUCTION

*“It is the failure of UK small enterprises to grow into large enterprises that may be at the heart of the country’s long-term poor economic performance”*  
(Storey, 1994, p159)

So wrote David Storey in a book based largely on research sponsored by, among others, the Department of Trade and Industry and the European Commission.

The importance of the small business sector in a thriving economy has been a theme of economic thinking since the mid 1980s. To some extent the environment faced by start-ups has improved through government policy and structural developments such as the emergence of new sources of investment, although the UK lags significantly behind the USA in this respect.

This paper presents the results of a study undertaken before the downturn in the technology sector, in 1999, exploring the impact of factors commonly cited as constraints on the growth of small and medium sized enterprises (SMEs)<sup>2</sup> in the software and services sector<sup>3</sup>. It sought to explore the prevalence of such factors and the extent to which firms’ attributes might influence their impact on growth. The study consisted of interviews with well-established industry figures and managers of SMEs.

This paper begins with an overview of pertinent theories and the results of earlier empirical studies of constraints and attributes influencing firm growth, and a brief introduction to the Software and Computer Services (SCS) industry. The construction and conduct of the study itself is then described, followed by a summary of the findings. The results are considered in the light of previous work, and a preliminary model is proposed to explain apparent anomalies.

## 2 FACTORS INFLUENCING GROWTH

The factors influencing firm development and success have been studied from a range of perspectives, but they could be said to vary primarily in the degree to which they have an external or internal focus.

Management theories of strategy and the firm have traditionally drawn on classical economics and regarded the firm as a black box, operating within a market environment. However, through the 1990s there was a growing recognition of the processes operating within the firm, again drawing on economics, but influenced by the work of writers such as Penrose (1959/1995) and Chandler (1961). Through the 1980s and 1990s the importance of the development of the firm and the challenges facing organisations at different stages of their lives was increasingly recognised.

In practice, of course, firms do operate in a market environment and have to respond to changes in it, but the way in which they respond will impact upon their chances of success. Work by Hawawini et al (2000) suggested that firm specific factors are

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<sup>2</sup> The firms of particular interest in this study were those with turnover between £2m and £25m

<sup>3</sup> The study was undertaken in conjunction with the Barcroft Partnership, a firm specialising in the merger and acquisition of firms in the SCS sector. The author is grateful for the assistance provided by Barcroft, particularly in identifying and gaining access to interviewees.

important for the most successful and least successful firms in an industry, but that industry factors are most significant for others. The finding is far from conclusive since the sample used comprised larger, publicly listed firms and included only survivors. However, it does highlight the need to consider both the firm and its environment.

External factors were prominent in the work of Michael Porter who's model of the elements of industry structure (Porter, 1980), identifies five key forces which act upon firms within an industry and is typical of industry-level, market-based approaches. Porter (1998) asserts that the first fundamental determinant of a firm's profitability is industry attractiveness. In the model, the relative strength of the five forces determines the ability of firms to earn rates of return on investment in excess of the cost of capital. Hence, as Porter puts it:

*"...despite the best efforts of management. Industry profitability is not a function of what the product looks like or whether it embodies high or low technology, but of industry structure."* (Porter, 1998, p. 345).

Porter acknowledges that firms can influence the five forces and shape an industry's structure, but he argues that the five forces framework should be used to direct the creative energies of managers towards the most profitable activity. He warns though that strategy must be formulated with a view to the long-term, recognising that changes to industry structure may have undesirable effects in the future. For Porter (1998) the basis of good performance in the long run is "sustainable competitive advantage". Sustainability of competitive advantage requires barriers to other firms; otherwise the firm must offer a "moving target" to its competitors by continuously improving its position.

From this perspective the young firm is more likely to succeed in an emerging industry dominated by small firms, though it must build a competitive position which can be sustained in the longer term. This, however, is a significant challenge because, as pointed out by Freeman (1995), the evolution of technology, products and markets is particularly rapid in technology-based industries where cycles are typically very short. Furthermore, new entrants, new technologies and consolidation among industry firms can undermine sources of competitive advantage and can change the shape of the industry and its boundaries. Hamel and Prahalad (1994) highlighted the problem of defining the relevant boundaries for an industry analysis since threats can emerge from outside the recognised industry group, whether through substitution products, or horizontal and vertical integration.

Baden-Fuller and Stopford (1992) argued that the focus of analysis should be on the firm:

*It is the firm that matters, not the industry. Successful businesses ride the waves of industry misfortunes; less successful businesses are sunk by them.* (Baden-Fuller and Stopford, 1992, p13)

The writers claim that there is little difference in the profitability of industries; that it is not industries that mature but the firms in them, and that "profitable" industries are so because they are inhabited by imaginative and profitable firms. Less than 10% of differences in the profitability of business units can be attributed to choice of industry. While accepting that industry conditions are influenced by economic upswings and downswings, they argue that successful organisations can ride those waves.

Whilst this might appear to contradict the Hawawini (2000) findings reported earlier, there is consistency in the finding that the most successful firms rely primarily on

their own strengths rather than industry factors and that the poorest performers appear to be, to some extent, architects of their own demise.

In response to perceived shortcomings in strategies placing too much emphasis on industry analysis, resource-based views of strategy (e.g. Barney, 1991; Mahoney and Pandian, 1992) came to prominence in the 1990s in recognition of the importance of factors within the firm in building competitive advantage. In essence, the theories propose a relationship between resources, capabilities and competitive advantage as shown in Figure 1.

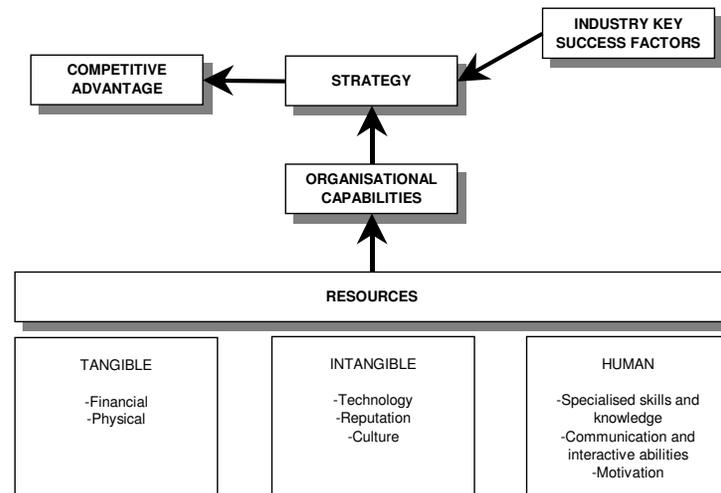


Figure 1 The relationships between resources, capabilities and competitive advantage (Grant, 1998)

The Resource Based View (RBV) suggests that profitability comes from exploiting the differences in resources and capabilities of individual firms (Grant, 1998). The development of an effective strategy, then, comprises of three elements (Grant, 1998, p.111):

- “Selecting a strategy that exploits a company’s principal resources and capabilities
- “Ensuring that the firm’s resources are fully employed and their profit potential is exploited to the limit”
- “Building the company’s resource base”

However, in formulating approaches which could be employed by strategists, modern theorists have been said to have lost the dynamic aspects of the original economic theories (e.g. Pitelis, 2002).

David Teece (e.g. Teece et al 1994) criticised earlier resource based approaches which tended to recommend firms’ accumulating technology assets and protecting them aggressively, in an attempt to ensure that their sources of competitive advantage are maintained. Teece pointed out that speed of response and flexibility are required along with the ability to co-ordinate and re-deploy resources in response to shifting market demands – features of industry recognized by Penrose in her original version of resource based theory (Penrose, 1995).

Dynamic capabilities are said to be a source of competitive advantage in fast-moving, seemingly chaotic, environments (Schumpeterian environments) and

emphasise both changes in that environment and the role of strategic management in reconfiguring the skills, resources and functional competencies available to the firm to meet the demands of those changes.

Teece proposed that:

*“...competitive advantage stems from dynamic capabilities rooted in high performance routines operating inside the firm, embedded in the firm’s processes, and conditioned by its history”* (Teece et al, 1994, p.553)

Such capabilities can only be developed over time, and cannot readily be bought. On the one hand, this implies that diversification may not be an appropriate strategy, but on the other, competitive advantage based on dynamic capabilities is very difficult for a competitor to replicate.

For Teece, the key to success is the development of a range of capabilities which allow the firm to exploit opportunities and deal with challenges:

*“Identifying new opportunities and organising effectively and efficiently to embrace them are generally more fundamental to wealth creation than is strategizing, if by strategizing one means engaging in business conduct that keeps competitors off balance, raises rivals costs, and excludes new entrants.”* (Teece et al., 1997, p.509).

The dynamic capabilities approach, then, presents firms as active agents preparing themselves for the challenges of the future. The firm’s success is, therefore, more likely to depend upon its own strengths than external factors.

Modern resource-based approaches address the attributes that a successful firm must have, but they have less to say about how the attributes required change over time, and how the young firm can grow to be a competent competitor. This is addressed by developmental, or stages of growth models.

In developmental models and theories the stage of development of the firm is seen as an important indicator of the key challenges faced by firms, and determines the key focus of management. The developmental perspective recognises the constant change which is a feature of most firms, but especially young ones.

Churchill and Lewis (1983) proposed a model of firm growth comprising of five stages. During the first stage, “existence”, customers are obtained and the product or service is delivered. During the “survival” stage the business becomes a working entity. This is followed by the “Success” stage during which the decision is made whether to expand or to opt for stability and profitability. The “take-off” stage is characterised by rapid growth and financial and managerial challenge. The final stage is “resource maturity” at which point the firm can engage in detailed operational and strategic planning.

Churchill and Lewis (op cit.) identify a number of key success factors: finance, personnel, systems, business resources, the owner’s goals, and the owner’s operational, managerial and strategic abilities. The importance of factors of success vary from stage to stage, but the writers assert that knowing the business’s stage of development can assist owners and managers to better understand the firm’s problems and to anticipate future challenges.

Amar Bhidé (1999), while acknowledging the intuitive appeal of models based on stages of growth, challenges their usefulness, given the great variety of ways in which firms grow and their ultimate destination. Bhidé sees firms adopting new strategies in response to competitive forces in the industry, at frequencies which vary depending upon the sustainability of their sources of competitive advantage, but are likely to be much higher for fledgling firms. For Bhidé:

*“Any actions entrepreneurs contemplate should be informed by the opportunities offered and constraints posed by the overall situation rather than by the firm’s ‘stage of growth’” (op cit., p397)*

Bhidé emphasises the development of the firm’s resources to face a range of alternative futures and the importance of good strategic planning, implemented through strong, visionary leadership.

Rejection of stages of growth models is understandable if these are interpreted, or employed, as universal route maps for firm development. However, such models do remind managers of the changing demands they will face as the firm develops and that these are distinctive for young firms. As Penrose put it:

*“The differences in the administrative structure of the very small and the very large firms are so great that in many ways it is hard to see that the two species are of the same genus. We cannot define a caterpillar and then use the same definition for a butterfly” (Penrose, 1995, p.19)*

Managers and researchers alike might benefit from an understanding of the process by which this metamorphosis occurs.

A further criticism levelled at growth stage models is the lack of an underlying theory of the processes underlying the changes observed in the nature of the firm as it grows. Garnsey (1998) attempts to address this proposing a systems model which draws on the work of Penrose, but focuses attention on the early growth of the firm. She describes young firms as going through processes of problem solving which often have sequential dimensions. Solutions generate new problems but in overcoming problems, learning occurs in new firms, which provides the basis for an expanded repertoire of skills and solutions. A number of mechanisms operate to reinforce growth including the economies of growth identified by Penrose (1995), and external pressures from stakeholders. Growth itself, however, brings with it the need for managers to delegate, problems with synchronisation of the firm, and the increasing need to manage external relationships.

While developmental processes are experienced by all firms (since these must mobilise resources and establish a resource base to create and capture value), whether there are identifiable phases and what form these take varies according to the type of activity and business model of the firm. A phase is a system state, while a process is a chain of actions and outcomes. Processes may occur simultaneously but system states cannot. Where phases occur as identifiable system states, this is because developmental processes have taken a form that brings about a sequence of states. Figure 2 illustrates the phases that may result from problem-solving processes in young firms that build an in-house production base (Penrose’s starting point). In firms of this kind, sequential phases are often brought about by developmental processes.

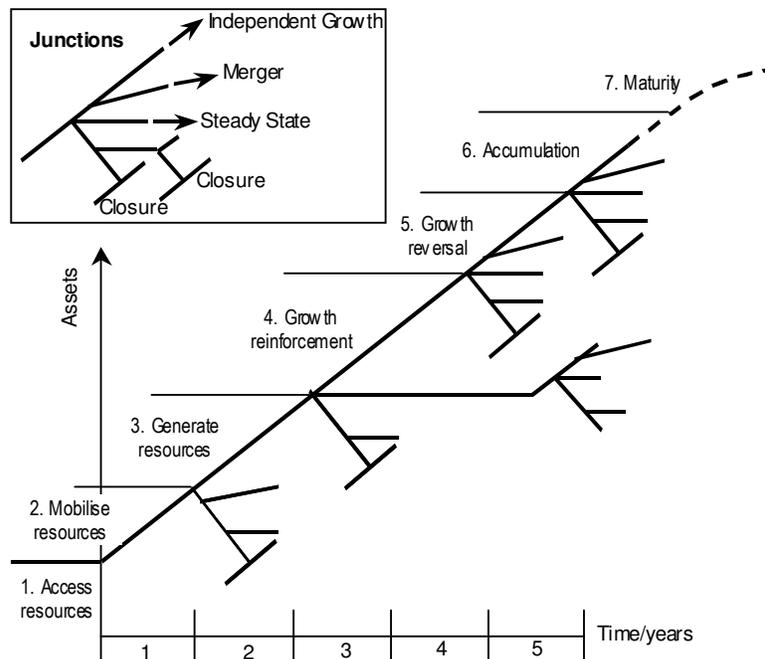


Figure 2 Diverse trajectories of a cohort of firms (Garnsey, 1998, p.548)

Unless it inherits resources (e.g. through de-merger), the new firm must access and mobilise initial resources in order to generate the further resources required for growth. While early phases shown in figure 2 are not uncommon, the form taken by further phases shows a great deal of variation. The recognition of multiple growth paths addresses Bhidé's (1999) criticism of growth stage models, but this approach emphasises the changing nature of the challenges facing the entrepreneur and the need for new firms to complete foundational processes in order to become self-sustaining - that is, able to achieve revenues and profits (resource generation). In later models being self-sustaining is summarised as the young firm's ability to create and capture value (Garnsey, Stam, Heffernan, 2006).

Key constraints emphasised by this model are management's ability to deal with knowledge and information, co-ordinate and deploy resources, and to effectively assimilate new resources into the organisation. But the model also highlights the significance of path dependence and recognises the impact of chance on the firm's growth and survival.

In the early stages of the firm's development the main problems faced relate to identification, access to and mobilisation of resources, and establishing the business. This could be characterised as a "project" phase, since the activities are mainly non-recurring and the focus is on the single objective of establishing the firm.

Later, different problems predominate, such as balancing business processes, developing competencies and establishing an industry position. As the firm grows, attention is likely to shift towards dealing with evolutionary change (both within the business and in its environment), increasing complexity and human resource issues.

This presents a pro-active view of developmental approaches, emphasising the need to lay the foundations of sustained growth early in the life of the firm, and the need to recognise the future impact of decisions.

To conclude then, firms appear to be influenced by the external environment, but can be responsive and proactive rather than passive. Building a successful firm will

require the development of competencies within the firm, based not only its portfolio of resources, but the ways in which the resources are configured and leveraged. Building internal competence and capabilities may be more important in regimes of rapid change.

Constraints on growth lie not only in external factors, but in the attributes of the firm and the competencies of those working in it. Empirical studies have approached firm growth from a number of theoretical perspectives to determine factors which promote or impede firms' advancement. In the following section empirical studies are explored to assemble a list of specific attributes and constraints to be investigated in the firm-related interviews.

## **2.1 Empirical evidence**

A number of research studies have been undertaken to investigate the problems facing small and medium sized firms, many focussing on the high-tech sector. A study by Moore and Segaghat in 1992 examined the constraints to growth of small high-technology firms. Firms reported problems with the recruitment of people with the necessary skills and knowledge, funding, though this appeared to ease as firms became established, and the availability of suitable premises. Further work by Moore (1994a), based on the ESRC CBR database, identified poor initial capitalisation as being associated with poor growth performance. Moore also found that the availability and cost of finance for expansion presented the most significant constraint on small high-tech firms, though acknowledging that service firms relied less on external funding than manufacturing firms. Work by Lumme, Kauranen, Autio and Kaila in 1993 also looked at small high-technology firms, as part of a study comparing British and Finnish firms. The researchers identified a number of challenges faced by growing firms including planning, marketing, technological change, research and development, finance, human resources, the availability and use of advisors, and internationalisation.

Birley (1995) studied failed UK firms of all types, interviewing bankers and accountants who had been associated with 486 independent owner-managed businesses. She identified the top ten factors which had contributed to failure: capital structure; the management Team; the economy; lack of customer diversity; poor financial management; owner attitudes; rising costs; lack of planning; pricing; suppliers. Eighty per cent of the failure themes identified related to managerial issues, while two thirds of respondents believed that failure would have been avoided if remedial action had been taken to address autocratic, inflexible owners, making decisions based upon emotion, and ignoring outside help.

Keeble (1998) examined growth objectives and their relationship with past and future performance. He found that actual growth rates often differ widely from forecasts or objectives, but that objectives were heavily influenced by recent performance. Larger firms, newer firms and innovating firms were all more likely than others to aim for substantial growth. In the same paper Keeble identifies key constraints as shown in Figure 3. Keeble notes that the most significant constraints are mainly external to the firm (availability of finance, increasing competition, market demand and availability of overdraft finance).

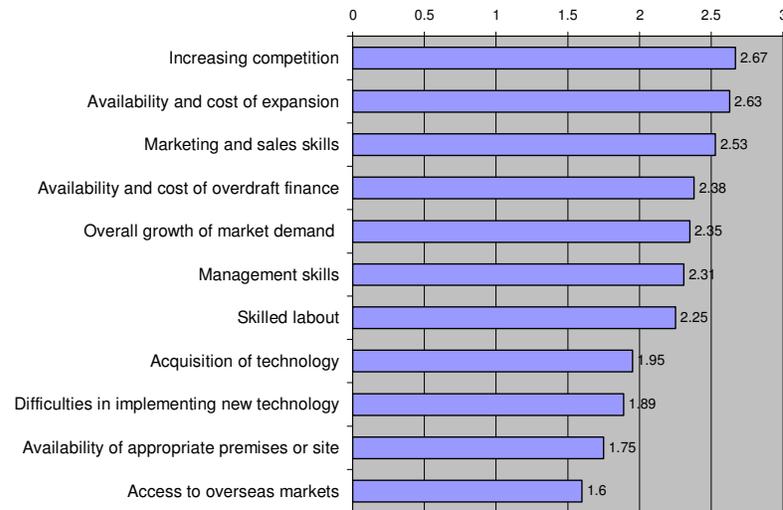


Figure 3 Significant constraints on ability to meet business objectives (Keeble, 1998)

Cosh and Wood (1998), on the other hand, noted the importance of at least one internal factor, finding that larger firms and faster growing firms had strengths in process innovation.

A study by Hughes (1998) examined the growth constraints on Small and Medium Enterprises (SME). Two main groups were identified in this longitudinal study: stalled growers and sustained growers. Sustained growers were more likely than stalled growers to believe that their competitive advantage lay in a technological edge and a range of expertise or products, and were also more likely to have dispersed ownership. They were also more likely to emphasise international markets and the importance of management or organisational factors. Stalled growers were more likely to rely on price or cost advantages. Both sustained and stalled growers rated personal attention to client needs, product speciality or quality and reputation as their most important competitive strengths.

Both sustained and stalled growers reported similar patterns of constraints of which the most significant were overall market demand, increasing competition, cost and availability of finance, management skills, labour skills, marketing and sales skills and implementation of technology (Figure 4).

### Phase 2 Firms: Constraints on Meeting Business Objectives 1994-5 Prospect and Retrospect

Median Scores (0=insignificant 9=highly significant)  
Number Reporting Scores in Ranges 7-9 shown in brackets

	Sustained				Stalled			
	Prospect		Retrospect		Prospect		Retrospect	
<i>Market Demand</i>								
Overall	5.7	(5)	4.9	(4)	6.1	(3)	7	(5)
Overseas	4.4	(2)	3.9	(1)	2.2	(0)	2.9	(1)
Increasing Competition	6.1	(4)	5.2	(3)	4.1	(2)	4.4	(3)
Total rating constraint 7-9		(11)		(8)		(5)		(9)
<i>Finance: Cost and Availability</i>								
Expansion	4.2	(4)	4.2	(2)	4	(1)	3	(1)
Overdraft	3.1	(2)	5.3	(5)	4	(1)	3.6	(1)
Total rating constraint 7-9		(6)		(7)		(2)		(2)
<i>Management and Labour</i>								
Labour Skills	4.8	(3)	4.3	(3)	2.4	(0)	5.1	(3)
Management Skills	4.1	(1)	5.7	(4)	3	(1)	4.7	(3)
Marketing and Sales Skills	3.8	(1)	4.3	(0)	3.4	(2)	3.7	(2)
Total rating constraint 7-9		(5)		(7)		(3)		(8)
<i>Technology</i>								
Acquisition	3.2	(0)	3.3	(0)	2.4	(0)	2.7	(1)
Implementation	3.9	(1)	4.1	(0)	2.4	(0)	2.9	(1)
Total rating constraint 7-9		(1)		(7)		(0)		(0)
<i>Premises or Site</i>								
Premises or Site	1.0	(0)	2.6	(2)	2	(1)	1.3	(0)
Total rating constraint 7-9		(0)		(2)		(1)		(0)
Total no of all constraints 7-9				(26)				(19)
Number of firms		10		10		7		7

Figure 4: Constraints on meeting business objectives 1994-5 prospect and retrospect  
(Hughes, 1998)

A study by PriceWaterhouseCoopers in 1998 (endorsed by the Computer Software and Services Association – CSSA) found a shortage of quality staff to be the greatest constraint faced by technology based firms. This was followed by availability of finance, increased competition, changing market demand, government/macro-economic issues and the ability of management to cope (Figure 5).

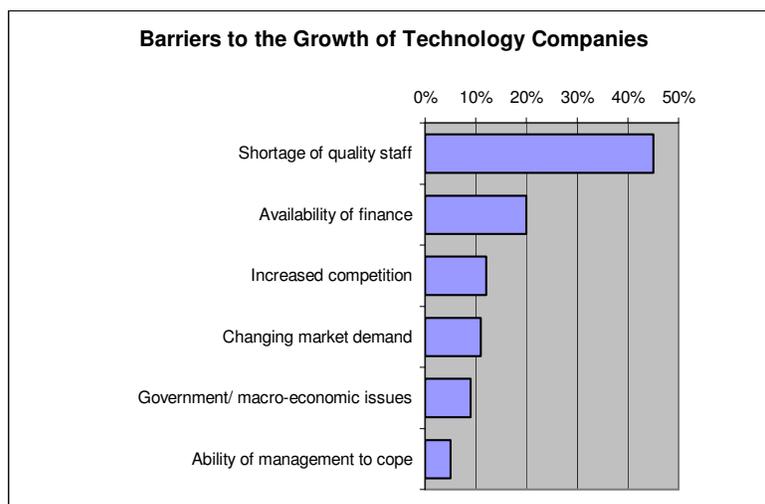


Figure 5 Barriers to the growth of technology companies (PriceWaterhouseCoopers, 1998)

The PriceWaterhouseCoopers study also found that the best performers in fast-growing technology organisations had identified a good niche and focussed tightly upon it. A “good” niche is one which involves a growth market with scope for expansion, and with opportunities to move into other areas when it becomes necessary.

### 2.1.1 Summary of empirical findings

From the above discussion a number of factors can be identified which may influence a firm's successful growth (Table 1). These include the firm's origin, age, size and development path, particularly its recent growth record. The sources of its competitive advantage and its preparedness to innovate and seek out new markets, particularly overseas, also have a bearing. Management and organisational factors seem to be highly significant, along with marketing and sales skills. A large number of potential constraints on growth have also been identified. The most significant problems appear to be availability of human resources and finance, poor marketing skills, market demand and management skills, particularly among owners.

<b>Factors influencing growth</b>	<b>Constraints on firm growth</b>
•Origin and age	•Management team skills
•Initial capitalisation	•Owner attitudes
•Ownership	•Effectiveness of planning
•Development path	•Human resources
•Growth objectives	•Availability of skilled people
•Size	•Availability and use of advisors
•Management or organisational factors	•Technological change
•Research and development	•Poor implementation of technology
•Technological edge	•Poor financial management
•Range of expertise or products	•Rising costs
•Product speciality or quality	•Capital structure
•Price	•Cost and availability of finance
•Cost advantages	•Cost and availability of overdraft
•Reputation	•Marketing and sales skills
•Internationalisation	•Overall market demand
•International markets	•Increasing competition
•Personal attention to client needs	•Lack of customer diversity
	•Suppliers
	•Government/macro-economic issues
	•Availability of premises or site

Table 1 - Summary of Attributes and Constraints

## 3 THE SOFTWARE AND COMPUTING SERVICES INDUSTRY

This study focuses on a favourable period for growth of software firms, around the Millennium, in order to identify difficulties that are likely to be present under all business cycle conditions. Before the economic downswing, the Software and Computer Services (SCS) industry in the UK was made up of approximately 70,000 enterprises, with 7,000 new ones created every year, though the majority of these were very small, often one-person, firms.

The SCS industry operated in a fast growing market worth approximately £16.4bn, which saw rates of growth increase consistently between 1993 and 1998 (Figure 6). Some sectors experienced growth rates in excess of 30%, while growth of UK firm's business overseas was 32%, with the USA featuring strongly. The UK itself was one of the fastest growing markets in Europe.

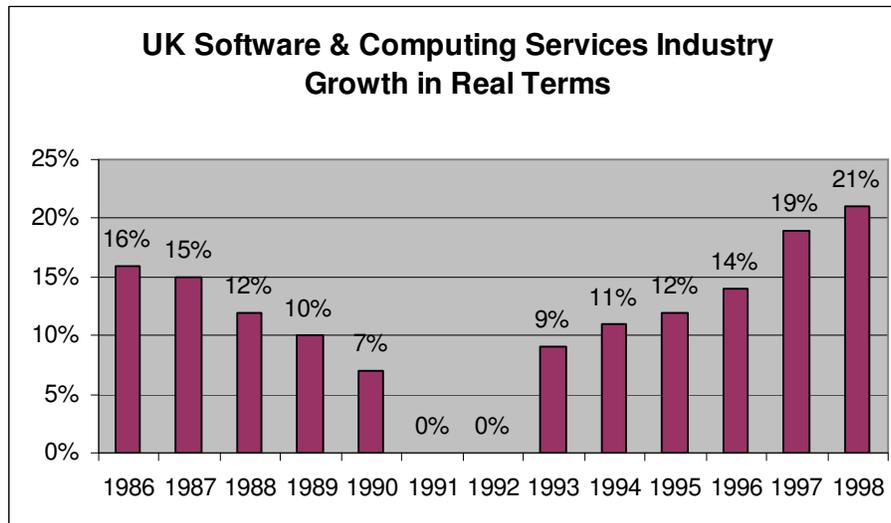


Figure 6 UK SCS industry – Growth in real terms (Holway 1999)

Profitability increased by 25% in 1998 (adjusted for one-off effects), but around 20% of companies reported losses. The ten largest companies were all foreign-owned and accounted for £6.4bn of sales. There were 385 merger and acquisition deals in the year to April 1999, involving considerations totalling £3.5bn and foreign acquisitions by UK companies exceeded foreign acquisitions of UK companies.

Of the £16.4bn turnover of the UK market, only £4.7bn (29%) was accounted for by applications software products and solutions, and tools, the remainder being services ranging from outsourcing to project management and consulting.

Growth rates varied considerably by size of company, as shown in Figure 7. Growth rates also varied by sector with project services at 31%, outsourcing 24% and system/operating software at -3%.

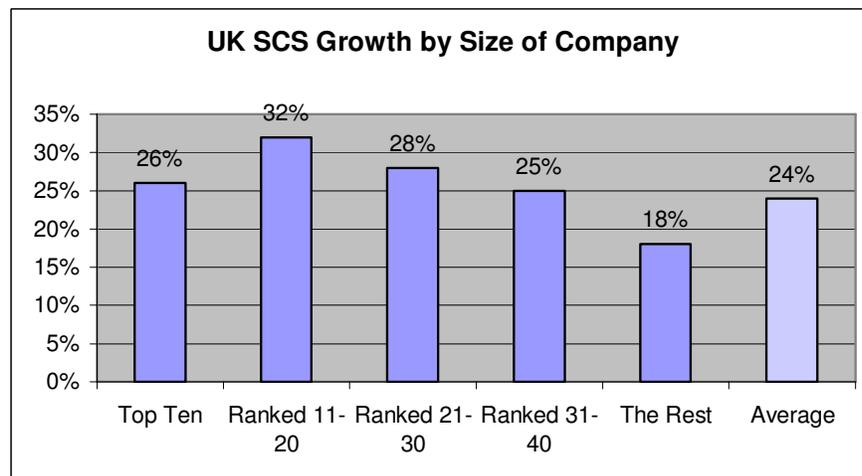


Figure 7 UK SCS Growth by Size of Company

#### 4 INVESTIGATING ATTRIBUTES AND CONSTRAINTS

The factors identified in the literature as influencing growth, or acting as constraints upon it, were used as a basis for the investigation. Data collection consisted of interviews with experienced industry figures, all of whom had been involved in a number of small and medium sized IT firms, and interviews with the managers of small and medium-sized companies in the sector.

The first group of interviews provided an overview, based on the experience of people involved in a large number of firms in a variety of executive and non-executive positions. These interviewees (Table 2) were expected to give a more objective view than those more directly involved with particular firms, and to identify factors specific to the SCS industry not necessarily found in the literature.

	<b>Current Status</b>	<b>Experience</b>
A	Director of a Venture Capital Fund specialising in technology-based enterprises.	Co-founded more than 20 technology-based firms
B	Director of an Industry Association	Employment in large CSS firms and 3 IT start-ups
C	Venture Capitalist and Business Angel	Chairman or director of 15 software companies
D	Mergers and Acquisitions Director of a Software enterprise	Founded and managed software and hardware companies; non-exec Chairman of software and electronics firms
E	Serial Entrepreneur and Management consultant specialising in IT firms	Employment in IT department of large engineering firm. Chairman, Managing Director and Director of software, hardware and services companies.
F	Chartered accountant specialising in Corporate Finance. Involved in mergers and acquisitions of SMEs.	Chairman or Non-exec director of 4 software companies.

Table 2 - Overview Interviewees

The second group of interviews, with managers, were intended to provide exemplar company profiles. The firms included represent small, medium and large organisations within the target population, and both software and services providers. Selection was based on details held on the Barcroft database, together with companies identified in the media and through the Cambridge Network. They provided more in-depth information on the issues faced by specific firms. The results were expected to be somewhat more subjective, but provided a perspective on the way in which influences are perceived at the time at which they are faced.

Managers from six companies were interviewed, selected to reflect a range of deliverables and sizes. Most companies were involved in software services rather than software packages, reflecting the shape of the UK software industry (Holway, 1999):

Firm	Age	Turnover	Staff	Type
Company 1	10 years	£20m	250 <sup>4</sup>	Software consultancy
Company 2	5 years	£20m	100	Software consultancy
Company 3	9 years	£17m	180	IT & PM consultancy
Company 4	10 years	£2m	31	Bespoke software developer
Company 5	14 years	£2m	45	Software package producer
Company 6	10 years	£5.5m	66	Software consultancy

Table 3 - Firms Selected for Management Interviews

#### 4.1 Interviews

The overview interviews were intended to provide a wide range of ideas and issues for further investigation and were, therefore, relatively unstructured, though informed by the literature review and discussions with the Barcroft Partnership. Due to the availability of the interviewees, two interviews were conducted by telephone, but the remainder were conducted at the interviewees' premises.

The management interviews were semi-structured, employing the framework presented in Appendix 1. The questions were derived from the literature and from issues raised in the overview interviews. The interviewees were executive directors of the firms in question, with the exception of company 5 where the former Managing Director was interviewed. Three interviews were conducted at the companies' premises, one at the director's home, one at the Judge Institute and one by telephone (company 2).

The focus of data collection for the company profiles was based on the literature described in Section 2 and the results of the overview interviews. The interviews and data search focussed on 4 aspects of the firms and their development (see Appendix 1), the rationale for the content of each was as follows:

*Section 1 – Employees, Sales and Profit for the last 5 years; Start up details and type of firm.*

Historic data was obtained to establish rate and pattern of growth, identified by a number of writers as a significant factor with respect to constraints encountered (e.g. Drucker, 1996; Garnsey, 1998; Hughes, 1998). Variations between industry sub-sectors have also been widely reported (e.g. Barber et al, 1989), as have the origin of the firm, the type of founders and the nature of funding (Barber et al., 1989; Garnsey, 1998; Hughes 1998).

*Section 2 – Source and experience of management team*

The experience and skills of the management team have been identified as a key weakness of many small and medium firms (e.g. Barber et al., 1989; Birley, 1996;

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<sup>4</sup> Directly employed staff numbered only 30. Most staff were self-employed on a contract basis.

Storey, 1994), while many management teams have also been found to be reluctant to seek out and use external advisors (e.g. Birley, 1996).

### *Section 3 – Strategy and source of business*

Strategic objectives have been identified as a factor in the growth of the firm, although rarely as directly as might be expected (e.g. Hughes, 1998; Keeble, 1998), while the ability to change direction in response to environmental pressures has been recognised as a key management competence (e.g. Grant, 1998). The importance of a good customer base was identified in the overview interviews as well as by Hughes (1998) and Birley (1996), though what represents a “good” size appears to vary considerably with the type of business. Establishment of international trade was also deemed important by some interviewees and supported in the literature (e.g. Lumme et al, 1993; Hughes, 1998).

#### Section 4.1 – Firm’s competitive advantages

The factors on which a company competes are expected to influence the degree to which it experiences constraints on its growth. Most of the items included in item 4.1 were taken from the study undertaken by Alan Hughes (1998) at the ESRC Centre for Business Research (CBR). The item on innovation was included in response to the work of Keeble (1998). The overview interviews had not raised any other significant features, nor had the earlier literature.

#### Section 4.2 – Constraints on growth of firm

This section also draws on the ESRC CBR, as reported in Hughes (1998) and Keeble (1998). The overview interviews confirmed most of these items, but also identified a shortage of management staff, access to customers in general, the strength of large competitors and a lack of credibility with customers. The importance of strategic decisions made early in the life of the firm has been identified by a number of resource-based strategists (e.g. Teece et al., 1994).

## **5 INTERVIEW AND SURVEY FINDINGS**

### **5.1 Overview Interviews**

Those approached were very willing to make the time available for the interview, generally about 30 minutes, though some were shorter. Most interviewees believed that the growth of IT firms beyond the start-up/small business stage is an important issue and most asked for access to the finished report. The findings of the interviews are summarised below under headings derived from the common themes raised.

#### **5.1.1 Marketing**

Marketing was deemed to be a great weakness in the UK, particularly when compared with the USA. There is a shortage of experienced staff and a poor understanding of the market. One interviewee noted that too many firms seem to think that “marketing is the thing you think about after you have developed the product”. It was also pointed out that marketing is too easy to ignore, since the impact of cutbacks in this area is not felt until 3-6 months later. Marketing was likened to the tiller of a giant ship – “the response is slow but powerful”.

### **5.1.2 Sector variations**

Most interviewees acknowledged that there are differences between software and services firms. One interviewee described the difference as being “channels versus people”. The key problem with services firms was seen as their resource limited nature, which meant that they were unlikely to grow very large, a fact exacerbated by cultural differences between national markets and the need to be located at the point of delivery. Services were deemed easier to sell in the sense that “what you see is what you get”, but margins are defined and always under pressure.

Software was said to be easier to sell in the USA than the UK, mainly due to the willingness to be early adopters, generally lower prices, and the corporate approach to software purchasing. The market is, however, dominated by a few large players, though it was pointed out that there are some “interesting crumbs” to be picked up by other firms.

### **5.1.3 Funding**

It was generally agreed that the venture capital industry in the UK compared poorly with that in the USA. The situation was improving, but there remained a high level of risk-aversion, with almost every fund aiming to invest only in firms certain to succeed. As one interviewee put it “things have got better, but only so that those who would have got funding anyway get it quicker”. The attitude to failure prevalent in Silicon Valley, where failure was said to be accepted as part of the investment process was, almost universally, seen as the way forward. However a warning note was sounded by one interviewee who wondered whether a smaller economy could bear a failure rate as high as that experienced in the USA.

The amount of work required of the firm seeking funding was also criticised, as was the failure to provide funding to early-stage companies, (which reduces the downside risk, but also limits the upside potential). One interviewee pointed out that limited funding also acts as a constraint on growth. The example was quoted of an internet-related company in the UK whose valuation grew from £200,000 to £26.5m in 21 months on first round funding of £500,000. The company’s main competitor, based in the USA but otherwise similar, achieved a valuation of \$2.4bn in the same period but with first round funding of \$23m. It was also felt that UK firms should not ignore US venture capital funds.

One interviewee described the capital structure of the firm as “probably the single most influential thing in the development of the business”. An example of poor structure was quoted describing one firm whose founders were keen to avoid venture capital, preferring instead to seek funding from “Business Angels”. The firm repeatedly sought additional funding, involving more and more investors as time went on. By the time the firm was acquired by a large American company it had 66 individual investors, with widely divergent views on its future strategy.

The involvement of external funders was generally deemed to be helpful, but this depended upon the particular circumstances of the firm, and the approach of the funders to it. A good fit between the two seemed to be the most important requirement. Ultimately, it was felt that independence was likely to be growth-limiting.

Inadequate initial funding was perceived to be a significant problem for any firm but even more so for firms which achieve rapid growth, since they may underestimate the high cash burn-rate required to sustain it.

#### **5.1.4 Management**

Management was identified as a key issue by all interviewees. There is a need for a broad skill base in the management team, though many founders are reluctant to recruit good people, fearing a loss of control. The founders themselves are often technically competent but not well suited to the management of a growing firm, and rarely prepared to accept the fact, or to accept advice.

There was deemed to be a lack of management talent in the industry generally, but at least one interviewee believed that the key requirement was for one “triple-A guy” around whom a team could be built.

Financial management and “commercial awareness” were specific areas of weakness highlighted, along with an understanding of business and particularly the need to manage cash flow as well as sales.

#### **5.1.5 Credibility**

Credibility was identified as an issue for small firms, though it was suggested that large firms were sometimes attracted to small firms due to their particular strengths of quick reaction, responsiveness and willingness to create new solutions rather than reproduce standard models. In addition, small firms were expected to remain loyal, and larger firms preferred to be in a powerful position over suppliers. However, the issue of liquidity remained a concern. One interviewee recalled a manager from a large firm saying “we like doing business with you but we wish you were larger so that we didn’t worry whether you would fold tomorrow”.

Although interviewees believed that relationships with large companies could be beneficial, they felt that small companies must beware of becoming too dependent on a single customer and must not expect to be supported by a customer when times are hard.

It was also suggested that credibility can be improved through the introduction of well-respected board members, a venture capital investor, or through marketing – either by traditional means or by means of the Internet (which can be particularly powerful as a first impression).

Overall, the credibility issue was regarded more as a challenge than a constraint.

#### **5.1.6 Survival**

It was pointed out that sustained growth relies on survival through difficult market conditions and other “bad times”. Momentum and size were identified as vitally important, as repeat business was likely to be the key to survival, but there was also a view that, particularly in crowded markets, consolidation meant that firms must “acquire or be acquired”. Although many small firms develop initially in niches, there was a view that a focus on a niche almost inevitably meant ultimately selling-out to a larger enterprise.

#### **5.1.7 Planning**

The importance of effective planning was identified by a number of interviewees. Expressed by one as “know where you want to be in 2 or 3 years and how you are going to get there”. This did not imply rigid adherence to outdated programmes, but required regular, almost constant attention to the actions necessary to achieve the firm’s objectives. One interviewee felt that many problems could be overcome if managers were only prepared to “sit and think”.

Exit strategies were deemed to be poor or non-existent in most firms, although it was pointed out that an Initial Public Offering (IPO), a merger or acquisition does not mark the end of the firm's development, but should be the beginning.

The future opportunities available to a firm were believed by some to be very closely linked to its past, although there are opportunities to change direction quite dramatically if the situation demands it. One interviewee stressed the importance of ensuring that, ultimately, all decisions improve the value of the company (and this is not measured purely in terms of market capitalisation).

#### **5.1.8 Internationalisation**

Internationalisation was regarded as important by most interviewees. There was deemed to be a need to operate at a European level, and increasingly globally, though the significance of this varied from firm to firm and was seen as more important for software package producers than for services firms. The main motive was not necessarily to access a larger market per se, but to be in a position to compete with competitors who are operating on a global scale.

#### **5.1.9 Other issues**

A number of interviewees highlighted the lack of effective networking in the UK, leading to poor interaction between industry players. Such interaction has been identified as a key feature of the Silicon Valley culture in the USA.

Although one interviewee identified a shortage of good advisors as an industry problem, another believed that advice was readily available but that firms are reluctant to pay professional advisors when free advice was at least as good.

Flexibility in property leases was also identified as a significant problem for some firms, although this tends to be much less severe for services companies than for those involved in production or distribution.

### **5.2 Firm-related Interviews**

#### **5.2.1 Company 1**

Company 1 was a software consultancy providing complete managed solutions to blue chip customers for all IT requirements. Large-scale software development and support was tailored to specific customer needs, with on-site expertise ranging from individual consultants to whole teams of developers, analysts and managers. The company was founded in May 1989 and had grown to an annual turnover of £20m. The customer base was approximately 20, with 5% of sales being outside the UK.

	1995	1996	1997	1998	est 1999 <sup>5</sup>
<b>Employees</b>	3	3	9	16	30
Sales £000s	1,919	3,694	7,801	15,800	20,300
Net Profits £000s	-54	325	820	2,600	3,000
<b>Founded</b>	1989				

### 5.2.2 Company 2

Company 2 was a software consultancy focussing on SAP implementation, though increasingly broadening their service to integration with other, related, products and services, such as e-commerce. The service extended into the provision of support and development of systems once installed. The company operated generally at the high-end of the market, with 30% of their business outside the UK, though almost all with UK clients. The company floated on the London main market in March 1999 valued at £85.4m, though market activity increased this to £120m almost immediately.

	1995	1996	1997	1998	1999 <sup>6</sup>
<b>Employees</b>	3	13	43	102	200
Sales £000s	1,445	7,161	10,353	20,024	
Net Profits £000s	32	1	10	1,224	
<b>Founded</b>	Oct 1994				

### 5.2.3 Company 3

Company 3 was an IT and Project Management consultancy operating in a wide variety of business sectors, including finance, utilities, public sector, defence, transport and retail. Services offered include strategy and business analysis, project management and support, and software and systems process improvements. Though they served a large number of clients, most were Blue-chip or public organisations. Only 5% of the business was outside the UK.

	1995	1996	1997	1998	1999
<b>Employees</b>	60	80	115	140	180
Sales £000s	3,200	5,270	7,250	12,600	16,500
Net Profits £000s	45	176	45		
<b>Founded</b>	1990				

### 5.2.4 Company 4

Company 4 was a bespoke software developer providing consultancy, development, training and support for client/server, web and CD applications. The company was

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<sup>5</sup> 1999 figures are the interviewee's estimates

<sup>6</sup> Public Limited Company – Results for Financial Year ending 1999 not yet published

based in London, with an office in Germany. The company was founded in 1989 and was acquired by a larger enterprise in 1999, though all staff and managers were retained. It served around 20 customers, with very little business outside the UK.

	1995	1996	1997	1998	1999 <sup>7</sup>
<b>Employees</b>			28	31	
Sales £000s	1,108	1,354	1,432	1,584	
Net Profits £000s	22	53	33	21	
<b>Founded</b>	1989				

### 5.2.5 Company 5

Company 5 was a software producer specialising in the financial sector. Founded in 1985, it was acquired by a larger enterprise in 1998. The company was founded by the then Chairman and had a turnover of around £2m at acquisition. The customer base was approximately 70, with around 35 active, and 50% of sales were outside the UK, mainly in Europe.

	1995	1996	1997	1998	1999 <sup>8</sup>
<b>Employees</b>	48	58	51	45	
Sales £000s	1,793	1,817	2,069	1,785	
Net Profits £000s <sup>9</sup>					
<b>Founded</b>	1985				

### 5.2.6 Company 6

Company 6 was an Internet software consultancy helping blue-chip corporate clients to develop and realise e-business strategies, from offices in the UK, USA and India. The company was founded in 1985, originally as a software product company, but in 1988 the focus shifted to software services. The estimated turnover for 1999 was £10m, and the customer base was approximately 40, with around 33% of sales being outside the UK, mainly in the USA.

	1995	1996	1997	1998	Est. 1999
<b>Employees</b>	29	44	51	66	120
Sales £000s	1,700	2,047	3,142	5,357	10,000
Net Profits £000s	203	177	73	379	
<b>Founded</b>	1985				

<sup>7</sup> Company 4 was acquired in 1999

<sup>8</sup> Company 5 was acquired in 1998

<sup>9</sup> Profit data not disclosed

### 5.2.7 Growth paths

The growth paths of the companies in terms of annual sales are shown in Figure 8. Annual sales figures for years prior to 1995 are based on extrapolation from the foundation date. The rate of growth experienced by companies 1, 2, 3 and 6 since 1995 is remarkable, given that all but company 2 were founded some time earlier (company 6 can be considered to have been founded in its present form in 1988). The growth of company 2 is even more dramatic, but its particular sector had been one of considerable growth (SAP).

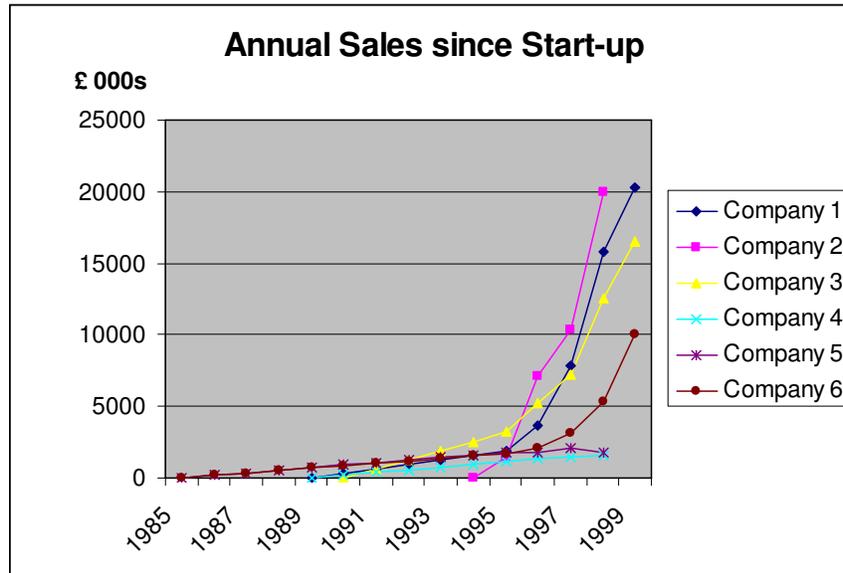


Figure 8 Annual sales since start-up for interviewed firms

Presented with 1995 as base 1 (Figure 9), 3 clear groups emerge, companies 1 and 2, large and growing rapidly, companies 3 and 6 not far behind them (with company 6 accelerating), and companies 4 and 5 with flat or slightly declining sales.

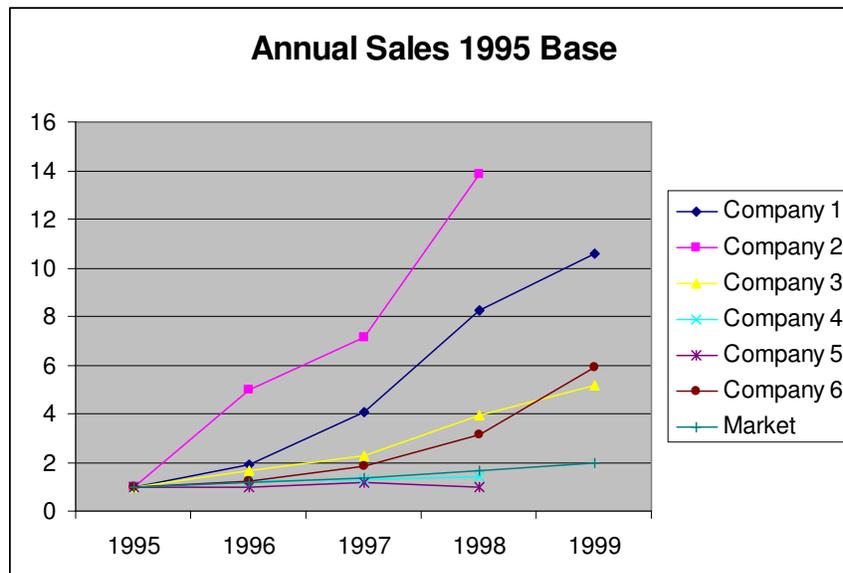


Figure 9 Annual sales on 1995 base for interviewed firms

Figure 10 shows the growth of the firms in terms of employment. No information was available for company 4, but it is understood that there was relatively little variation over the 5-year period. The figures for company 1 are misleading since these relate to permanent staff only. By 1999 company 1 was employing around 220 additional staff on a contract basis. As would be expected for services companies, growth of employment has broadly followed growth of turnover.

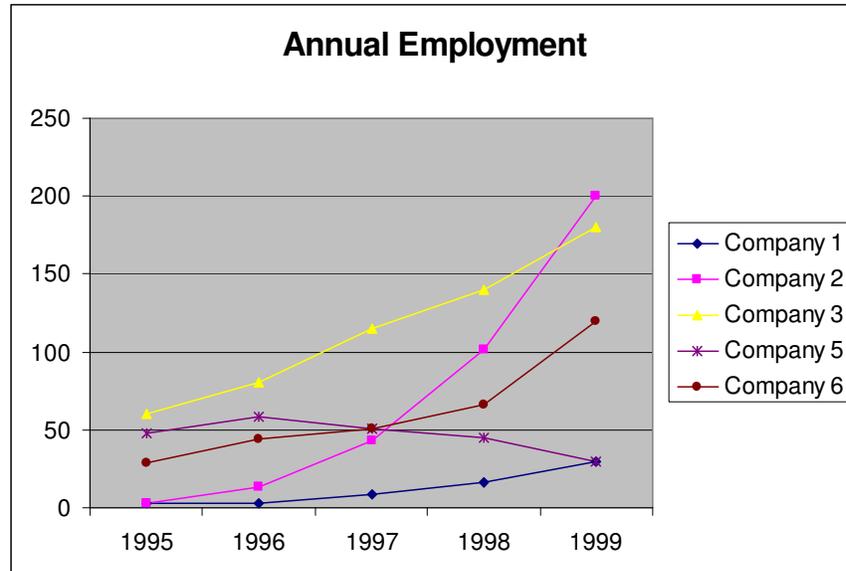


Figure 10 Annual employment for interviewed firms<sup>10</sup>

### 5.2.8 Summary of findings

The findings of the individual company interviews are summarised in Table 4

<sup>10</sup> No historic employment data was available for company 4

Interview Summary - Attributes and Constraints						
Attributes	Company					
	1	2	3	4	5	6
Turnover (£)	20m	20m	16m	1.7m	2m	6m
Rate of growth of annual sales (last 2 years)	66%	69%	52%	8%	0%	79%
International business	5%	30%	5%	0%	50%	33%
Marketing/promotional skills					✓	✓
Speed of service	✓	✓	✓	✓		✓
Established reputation	✓	✓	✓	✓	✓	✓
Cost Advantages			✓			
Flair and creativity				✓	✓	
Contract Innovation	✓	✓				
Personal attention/responsiveness to customers	✓	✓	✓		✓	
Flexibility	✓	✓		✓	✓	
Process	✓	✓	✓			✓
Quality of Staff	✓	✓		✓		✓
Price	✓		✓	✓		
Product or service design	✓			✓		✓
Product or service innovation				✓		✓
Product or service quality	✓		✓	✓		
Specialised expertise/product/services			✓	✓	✓	✓
Range of expertise/product/services	✓					
Recognising needs of market		✓				
Experience			✓			
<b>Constraints</b>						
Availability and cost of finance for expansion						
Shortage of skilled labour	✓	✓	✓	✓		✓
Shortage of experienced management staff						
Management effectiveness				✓	✓	
Marketing and sales effectiveness			✓			
Difficulties in acquisition of technology						
Difficulties in implementing new technology						
Availability of premises or site				✓		✓
Availability of knowledgeable professional advisors						
Access to customers	✓					✓
Access to overseas markets						
Overall growth of market demand			✓			
Increasing competition			✓			✓
Strength of large competitors						
Lack of credibility with customers	✓	✓			✓	✓
Strategic decisions made early in the firm's life	✓					✓
Reluctance to Recruit					✓	
Founder					✓	
Poor Reputation					✓	

Table 4 Company interview summary – attributes and constraints<sup>11</sup>

### 5.2.8.1 Attributes

All of the firm-related interviewees<sup>12</sup> regarded an established reputation as an important attribute. Even the small firms had established a reputation within the niche that they served and believed that this was important both in generating repeat business and obtaining new customers. It is worth noting that company 5's good

<sup>11</sup> Reputation appears as both an attribute and a constraint. Established reputation was deemed by all to be an attribute of their firms. However, Company 5 had suffered with some customers as a result of failure to meet promises, and this had become a constraint on the firm's growth.

<sup>12</sup> In the following discussion firm-related interviewees are referred to as *managers* 1-6, corresponding to the firm with which they are associated

reputation was based on its early years of operation when its focus was firmly on a particular group of customers.

Speed of service was also widely regarded as important by all but manager 5. Although only managers 3 and 4 identified this explicitly, managers 1, 2 and 6 identified Rapid Application Development (RAD) as highly significant and this has been taken to be equivalent.

Four managers (1, 2, 4 and 5) believed that flexibility was important, but in the case of company 5, excessive flexibility created its own problems, with some sales requiring extensive customisation of the software package.

Development and management of processes was a key feature of all of the fast-growing firms (companies 1, 2, 3 and 6), and a particular weakness of company 5. Company 4 was one of the first in its sector to achieve ISO 9000 accreditation, but the value of this, other than to qualify for some tenders, was deemed to be limited. The two largest firms also focussed on contract innovation, offering fixed price contracts and risk-sharing arrangements. All but the managers from the two largest firms identified specialised expertise as strengths.

Marketing and promotional skills were identified by only two managers (5 and 6), although manager 1 believed that this was something that would have to be developed soon. Price was identified as an important feature for 3 firms (1, 3 and 4), although in the case of company 4 this was seen as a pre-requisite for small firms rather than a selling point.

The quality of staff was raised by four managers (1, 2, 4 and 6) as important, with all of these firms investing in development and training, despite the fact that the vast majority of company 1's staff were employed on a contract basis. Company 3 also employed large numbers of contract staff, but it relied on individuals to deal with their own training and development needs in most cases. Manager 4 believed that the competencies of the firm were those of its staff, with very little more derived from "corporate learning".

#### 5.2.8.2 *Constraints*

The shortage of good quality labour was identified by all managers but one (manager 5), although the extent to which it had actually slowed growth was unclear. In the case of company 5, the problem had not occurred due to the firm's reluctance to recruit from outside, even when skills it required could easily be acquired. Manager 4 reported problems in retaining staff, particularly those who had joined as graduates, due to the limited development opportunities available in a small firm.

Four managers recognised the problems of credibility with large customers. For the largest firms (companies 1 and 2), this was felt to be largely a thing of the past, particularly for company 2 where a distinct improvement had been noted since its Initial Public Offering (IPO). For company 5, the problem had increased in recent times due to its poor delivery performance and was not therefore directly linked to its size or stage of development. Manager 6 reported that the problem of credibility was much greater in the UK than in the USA. A related problem reported by manager 6 was the difficulty in identifying and gaining access to decision makers.

Management effectiveness was identified only by the managers of the two smallest firms. In the case of company 4 this was due to a reduction in the enthusiasm and flexibility of the founders who were not always willing to challenge accepted practice. In the case of company 5, it was suggested that the most significant problem was the founder's reluctance to cede control of the firm to the management

team and his unwillingness to accept advice, though, as mentioned elsewhere, this was the personal view of an interviewee who had already left the firm.

Marketing and sales effectiveness was identified as a constraint only by manager 3; though manager 1 noted that without development in this area it could become a problem.

Only two managers recognised decisions made early in the firm's life as a source of current constraints. Manager 1 believed that as a software services firm, the company's growth was constrained by its reliance on new resources. It was felt that software products should be developed alongside the present business in order to provide more scope for expansion. Company 6's problems were said to relate to the premises originally selected by the firm which were rapidly outgrown, leading to the firm being split across a number of sites. This appeared to be more of an operational problem than a growth constraint per se.

### *5.2.8.3 Correlation between features and constraints*

There appear to be few areas of correlation between the attributes of the firms and the constraints encountered by them, but the following items were noted:

- The development of management systems and processes was a feature of all four fast-growing firms.
- The two smallest (and slowest growing) firms both reported problems with management effectiveness.
- The two smallest (and slowest growing) firms have both been acquired by larger concerns.
- Problems with credibility due to size were reported by fast growing firms, but not the slow or stalled firms.
- The largest firms are among the fastest growing.

## **5.3 Summary**

### *5.3.1 Comparison between overview and firm interviews*

There are a number of differences between the issues raised in the overview interviews and those with the managers of individual companies.

The problem of poor marketing skills was deemed highly significant by the first set of interviewees, but only manager 3 regarded this as a constraint, although manager 1 recognised the need to improve its marketing skills to maintain growth.

Variations between the software and services sectors noted in the overview interviews were acknowledged by manager 1 who recognised the potential limits to growth in the services sector and the attractions of software packages. It is worth noting that the division between software and services is not very clear. Company 5 was ostensibly a software package business, but it was heavily involved in customising the product for individual customers, while company 6, which was primarily a services company, had built up a development capability.

Although a number of managers made reference to the poor state of UK venture capital, none identified funding problems as a constraint, although a number reported the need to match growth to revenue generation. This finding appears to be at odds with the findings of the overview interviews.

Most managers acknowledge the importance of good management in developing the firm, and the two slowest-growing firms both reported problems with management effectiveness. Furthermore, the problems evident in firm 5 with respect to the activities of the founder were as predicted. The presence of at least one “Triple-A guy”, a particularly capable person, does appear to be borne out in companies 1, 2, 3 and 6, with strong individuals with good management skills, leading all four firms.

Credibility was recognised as an issue by a number of managers, but it appeared to have been overcome in most cases. Company 4 had suffered badly from reliance on a single large customer which represented 70% of its workload at the time when all work was withdrawn due to a global policy. Although company 4 survived, and maintained profitability, it failed to reach previous levels of turnover. These findings are consistent with those of the overview interviews

Other than manager 4, none of the managers reported crises or particularly bad trading periods in their firms’ histories. However, there was evidence that most firms had responded to the market by shifting the emphasis of their business, if not the actual strategy. This was most obvious in the move towards e-commerce reported by all firms other than company 5. Hence successful firms did appear to be moving beyond their initial niche, a strategy consistent with the findings of the overview interviews (and PriceWaterhouseCoopers, 1998).

The importance of planning emphasised in the overview interviews appears to be echoed in the individual firm interviews. The two largest companies both planned with 2-3 year horizons and monitored and reviewed the plans regularly. Company 6 also had a well-developed planning process, which, although introduced at the behest of non-exec directors, appeared to have been adopted wholeheartedly. Companies 3, 4 and 5 did not have formal planning processes, and also had lower rates of growth than the other 3 enterprises.

The concerns about an acute shortage of good staff expressed in the overview interviews were echoed by 5 of the 6 managers, while manager 6 also expressed concern about the high salaries demanded by junior staff.

Despite the importance attached to internationalisation by the overview interviewees the managers seemed almost casual in their approach to overseas markets. Four were active in foreign markets, with most in the USA, only company 5 had significant sales in mainland Europe.

The managers reported no particular problems with access to foreign markets, though company 4 had had difficulty in Germany, and most agreed that the USA is less difficult than Europe. The attitude of customers in the USA was noted by managers 6, echoing similar comments from the overview interviewees.

Networking was not identified as a problem for any of the firms despite being raised as a significant issue in the overview interviews. The use of external advisors appeared to be limited to non-executive directors but no shortage was reported.

The problems of property and leases were raised by only two of the managers interviewed.

The most significant constraint reported by managers was a shortage of good quality labour. The overview interviews additionally identified the venture capital system in the UK, poor management, poor marketing and bad planning.

## 6 REVIEW OF FINDINGS

The six firms considered in this study vary considerably in size, age, development path and growth rate. Four firms (companies 1, 2, 3 and 6) had achieved annual sales growth rates in excess of 50%, while the other two (companies 4 and 5) were more or less stalled. These groupings will be used through most of the following analysis.

### 6.1 Attributes

The citing of reputation by all the managers as a significant attribute reflects the fact that all of the firms were focussed on particular market sectors or niches. The two small firms served smaller groups of customers than the larger four and were able to survive even quite difficult market conditions through repeat business and recommendations<sup>13</sup>. The importance of reputation is consistent with the findings of the PriceWaterhouseCoopers (1998) study with respect to market focus. The four fast growing firms were all focussed on fast growing sectors involving Enterprise Resource Planning (ERP) or e-commerce and had found it possible to move with the market into new sub-sectors

Speed of service was also reported as an attribute of all but one firm. Hughes (1998) also reports this as an area of perceived competitive advantage for both stalled and sustained growth firms. This was raised in the overview interviews as one of the features of small firms which made them attractive suppliers to large firms.

The managers of the fast-growing firms all emphasised management systems and processes consistent with the findings of Hughes (1998) and Birley (1995), while manager 5 reported this as a weakness. Although company 4 had invested in management systems for ISO9000 accreditation, this did not appear to be at the heart of the firm's operations. Only managers 4 and 6 regarded their firms as product innovators, though company 5 was also based on the development of unique software products. All the fast growing firms were, however, process innovators, a finding consistent with those of Cosh and Wood (1998).

The managers of the three fastest growing firms all identified the quality of their staff as a significant contributor to their competitive edge and invested in training and development. The emphasis on excellence among these firms was again consistent with Hughes (1998). Company 3 was alone among the fast growing firms in failing to emphasise the development of staff and Figure 6 shows its rate of growth levelling off in 1998/99. Whilst one year's sales results cannot be taken in isolation, this may indicate that the firm needs to concentrate more on development of its capabilities.

Well-developed planning processes were also a feature of the three fastest growing firms, the managers of which recognised the need for clear objectives and plans to achieve them. This concurs with the views emanating from the overview interviews, and with work by Lumme et al (1993) and Birley (1995). The managers of fast-growing firms were also more likely to report rapid growth strategies. Keeble (1998) also identified this relationship, but he infers that the causal link is from recent past growth to reported strategy rather than vice versa, a view supported by Hughes (1998) who found no significant difference between the growth objectives of sustained and stalled growers in his vertical study. Despite this, among the selected firms clear differences were evident between the slow-growing companies 4 and 5,

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<sup>13</sup> The importance of reputation in sustaining growth was also reported by Hughes (1998)

and the fast growing companies 1, 2, 3 and 6. Among this latter group, the manager of company 3 reported a strategy of steady rather than rapid growth, and although its growth rate has been relatively high over recent years it is not on the type of trajectory exhibited by companies 1 and 2 (and to some extent by company 6<sup>14</sup>). All of the surveys are based on reported strategies, which, as pointed out by manager 5, is not necessarily the same as actual strategy. In addition, it is one thing for a firm to state a growth strategy, but without a credible plan for achieving it, its delivery is quite another thing. The firms which exhibited the highest rates of growth (companies 1, 2 and 6) all had clear objectives and systems in place to manage towards those objectives. Management intent may, then, influence firm growth, but the expression of this intent requires much more than a simple statement on growth strategy.

The managers of all but the two largest firms identified specialised expertise or services as significant attributes, an item reported by Hughes (1998) as common to stalled and sustained growers. Although managers 1 and 2 did not specifically mention this item, a review of their companies' literature makes it clear that they do emphasise specialised skills, particularly in the case of company 2. Most managers perceived flexibility or responsiveness to customers as important, consistent with Hughes' findings.

International business was a significant feature of all firms other than companies 3 and 4. Lumme et al (1993) and Hughes (1998) both reported international business as being associated with successful firms. In practice, only companies 1 and 6 had international growth strategies, since company 2 served almost entirely UK customers abroad, and company 5 served a very small and specialised client group in Europe. Part of the rationale for company 1's entry into the US market was said to be to ensure exposure to the latest technological developments ahead of their introduction to the UK.

Marketing and promotional skills were claimed only by the managers of companies 5 and 6. The overview interviewees identified this as a weakness of British firms generally, so the finding is not unexpected.

## 6.2 Constraints

The most commonly identified constraint among the interviewees was the shortage of good quality labour which was raised by all but manager 5 (which had not sought to recruit significant numbers of skilled staff). This is, of course, regarded as the most serious problem facing technology based companies (Moore and Segaghat, 1992; PriceWaterhouseCoopers, 1998), and is reported to be particularly severe in Information Technology (IT) sectors (e.g. Keeble, 1998). All the managers emphasised the quality of staff, suggesting that many of those seeking employment in the industry were not of the requisite standard. This was also raised as an issue in the overview interviews. Manager 4 reported the additional problem of retaining staff, an issue common to many small firms which are unable to offer the range of development opportunities available with larger firms. But the shortage of good quality staff is reported to have spread the retention problem to larger firms according to PriceWaterhouseCoopers (1998).

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<sup>14</sup> Company 6 reported having instigated a formal planning system, at the behest of non-executive directors, at about the same time as it commenced its recent increased rate of growth.

Lack of credibility with customers was the second most common constraint, recognised by 4 managers. Company 5's problems appeared to be largely due to poor delivery in recent years as this had not been a problem earlier. The other three (managers 1, 2 and 6), all reported the typical problems of small firms trying to be taken seriously by large customers. Manager 6 saw this mainly as a problem of accessing key decision makers. The problem of credibility is not raised in the literature, but was identified in the overview interviews. Most of the companies (the three fastest growing) appeared to have overcome the problem but it was recognised as a challenge.

Poor management effectiveness is widely recognised as a problem for growing firms (e.g. Barber et al, 1989; Storey, 1994; Birley, 1995) and was identified by the managers of the two smallest firms, though a much greater problem for company 5 (with respect to its founder), than for company 4<sup>15</sup>. The overview interviews identified this as a significant problem, but it is not surprising that firms did not report it more widely, given the natural reluctance to self-criticise.

Similarly, only manager 3 identified marketing and sales effectiveness as a constraint, despite this being identified as a significant issue by a number of researchers (Lumme et al., 1993; Keeble, 1998; Hughes 1998), and by the overview interviewees. Again there may be a reluctance among interviewees to be self-critical.

Decisions made early in the firm's life were not recognised as leading to constraints for firms other than 1 and 6. Manager 6 identified a problem of split-site accommodation, but it is difficult to see how the firm could have committed to the accommodation to which it was about to relocate earlier in its existence. For company 1, the decision to focus on services rather than software packages was perceived as a genuine constraint, reflecting the views of some of the overview interviewees. Starting the firm with services could, however, be a sound strategy for organic growth as services firms generate revenues much earlier in their lives than software package firms, and permit a greater degree of flexibility.

A number of constraints reported in the literature were not reported by the managers interviewed. These include increasing competition and overall growth of market demand (Keeble, 1998; Hughes, 1998); cost and availability of finance (Moore, 1994); acquisition and implementation of technology (Keeble, 1998; Hughes, 1998); government/macro-economic issues (PriceWaterhouseCoopers, 1998).

It is, of course, possible that the managers, particularly 1, 2, 3 and 6, had derived strategies to overcome growth limiting market factors. There is certainly evidence to suggest that firms have generally been adept at evolving their strategy to take account of new technologies and customer demands. Company 4's strategy was not based on significant growth and it may not therefore have encountered market constraints within its limited niche. The interviewee for company 5 similarly reported that the underlying strategy of the firm was to maintain a steady state. On the other hand it is also possible that the fast-growing interviewed firms had failed to recognise external factors while they were able to maintain very high rates of growth into an expanding sub-sector of the market.<sup>16</sup>

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<sup>15</sup> It should be noted that the interviewee for company 5 had recently left the firm and was perhaps therefore more willing, and perhaps more able, to adopt a critical stance.

<sup>16</sup> Companies 1, 2 and 6 were all expanding into e-commerce.

The acquisition of technology was not deemed a problem by any of the managers. For company 5, this appeared to be due to its tendency to develop everything in-house. The other firms had taken advantage of the providers' partnering networks to access technology, and saw its implementation as their prime function.

Only manager 1 mentioned government intervention, and this was with respect to new regulations covering the employment of contract staff, and then only in passing. It is therefore assumed that this issue is not significant for the firms interviewed. This may indicate that government legislation acts as a constraint for a limited number of firms in particular niches within the market, though for the firms affected it would be significant.

Problems with the cost and availability of finance appear regularly in surveys and studies of firm development and growth (e.g. Barber et al., 1989, Storey, 1994, Cosh and Hughes, 1998) and were recognised by most of the overview interviewees. The managers also recognised the difficulties of obtaining venture capital funding in the UK, as compared with the USA. Manager 6 also reported the fact that investors were now approaching the firm, as its success became apparent, having been absent previously. Company 2 had obtained funding from the stock market via an IPO seemingly without great difficulty. None saw funding as a constraint. It should be noted, however, that all but one of the firms was focussed on the provision of computing services rather than software packages. It is well recognised that the funding requirements of services companies are much less severe than those of manufacturing or production enterprises both at start-up and during growth. The single software package provider had not grown significantly for many years, apparently at least partly due to its founders preferred strategy, and was therefore unlikely to require high levels of capital investment. A protracted development period and a lack of sales had created something of a cash crisis, but this appeared to have had less to do with the external market for financial resources than its internal problems.

Overall, then, the findings were generally consistent with the literature, or could be explained by the particular features of the industry. The main exception was finance.

## **7 EXPLAINING FIRM GROWTH**

Whilst the findings of the present study can largely be understood in the context of the industry, and the findings of previous work, no distinctive patterns of attributes and constraints emerge from the empirical evidence. Consideration of attributes and constraints alone does not explain the differential performance exhibited by the firms investigated in the study. In order to come closer to such an explanation, the evidence can usefully be explored from a number of theoretical perspectives, and the following discussion will review the findings with respect to the themes outlined in Section 2.

### **7.1 Market based approaches**

The constraints metaphor itself is in the tradition of conventional economic theories of the firm, and strategic models derived from them such as the work of Michael Porter (e.g. Porter, 1980, 1998). Many constraints are outside the firm acting on it, and this principle persists to some extent in the model proposed by Hughes (1998). These types of approach have proved useful in the analysis of the problems facing

mature firms, but it is less clear how far they can be applied to growing or “emerging” firms.

Given that firms are seen to be responding to forces in the external market, and manoeuvring themselves to gain advantage over competitors, market, or external factors ought to predominate in the mind of the entrepreneur. The firms studied here actually do identify an “external” factor, the availability of suitable labour, as their most common constraint. Keeble (1998) reports that in his study five of the top six constraints were external. Lack of credibility with customers might also be regarded as an external constraint, but the firms had largely overcome it.

Other key external factors such as the availability of financial resources, market demand and increased competition were not perceived as constraints on the interviewed firms. It could be argued that the firms had not yet reached a stage of development at which these factors were effective. For instance, the fast growing firms were relatively young and expanding into a growing market. Given a total market value in excess of £16bn, the turnover of even the largest firms represents a tiny fraction (0.1%), although this should ideally be related to the firms’ target sectors rather than the market as a whole. Further evidence of the impact of market conditions is provided by the rapid growth rates achieved by companies 1, 3 and 6 from around 1995 following years of relatively slow growth which more or less coincided with stalled growth in the market (Figure 6).

However, from a market based perspective, firms of a similar size and at similar stages of development would be expected to perceive similar constraints to their growth, something which is not a feature of the study group. Hughes (1998) acknowledges this fact in his reference to resource-based theories of the firm, and incorporates firm capabilities and resources into his model.

## **7.2 Developmental approaches**

All of the managers recognised significant changes in the demands placed on managers as the firm grows. Companies 1, 2 and 6 were led by people with strong management skills, but all had seen or expected to see changes in the senior management team as those who preferred the role of a small business manager left the organisation or withdrew from the senior management role. The effects of the founder not allowing the management system to develop were seen in company 5, where the firm’s growth was crippled by the kind of problems identified by Birley (1995). In the case of company 4 the founders recognised that the necessary development could only take place within a larger organisation and had sought out an acquirer.

The model proposed by Garnsey (1998), describes the stages of growth experienced by young firms. Two stages are of particular interest here: growth reinforcement and growth generation.

The growth reinforcement stage is said to apply where “unusual” firms succeed in mobilising rapidly and generating revenue early, often aided by growth markets. A number of mechanisms operate to reinforce growth including the economies of growth identified by Penrose (1995), and external pressures from investors and partners or customers. The rapid growth brings with it the need to for managers to delegate, synchronisation of the firm, and the need to manage external relationships.

The computer software and services industry operates in a fast growing market. But it is also unusual in that revenues can be generated very early in the firm’s life, and production/service provision can be scaled up with relative ease when compared with other high-technology sectors, even for software package producers. There is no

requirement to construct an infrastructure to support the product, and the equipment required is generic and of relatively low cost. Manufacturing, where it applies, is usually undertaken by third parties, either as distributors or sub-contractors. Conditions are therefore ideal for rapid growth and reinforcement.

The emphasis on the demands placed on managers to succeed in conditions of growth reinforcement is consistent with the evidence of the firms interviewed. The fast-growing firms (companies 1, 2, 3 and 6) all rely heavily on partnerships and have management systems in place to deal with the co-ordination of the firm's resources. Company 3, which does not appear to emphasise management systems to the same extent shows signs of levelling off in its growth trajectory, presumably as the co-ordination and management problems increase.

The Garnsey (op. cit.) model also points out that growth paths vary considerably, with some firms operating on a growth plateau for a time, before resuming growth when the constraints on them have been addressed. Companies 1 and 6 certainly exhibit this type of development, having been in existence for some years before they achieved high rates of growth.

The growth path of company 5 exhibits growth reversal (Figure 11), following growth of 13% in the year ending 1997. According to the interviewee the additional sales were perceived by the founder and management team as the beginning of a recovery and efforts to obtain venture capital were curtailed.

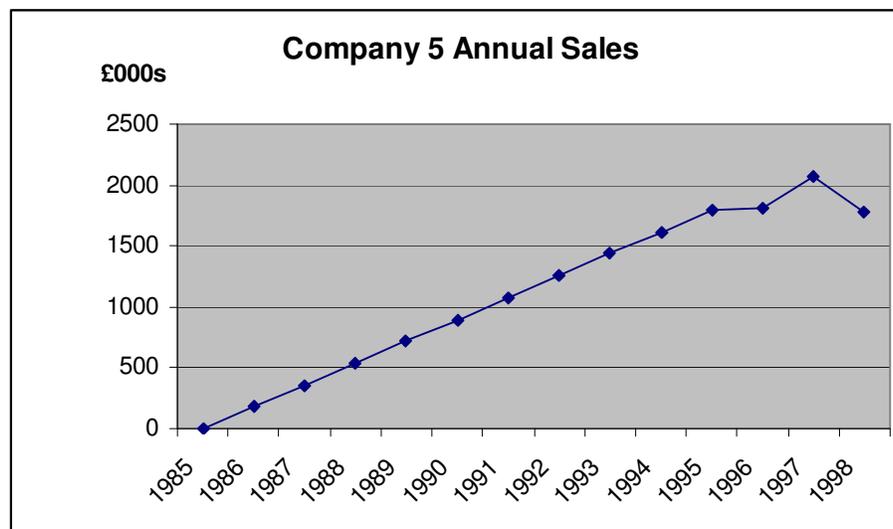


Figure 11 – Company 5 Annual sales

Developmental approaches draw attention to the impact of early decisions on a firm's later growth (Garnsey, 1998). For example, lock-in, whereby commitment to a particular sector or activity closes out alternatives, and the initiation of networks of relationships and partnerships, are both features of the early stages of firm development which can serve to constrain or promote growth. Such effects can be very enduring, having been identified even in long established firms such as the 100 year old grocery firms studies by Harris and Ogbonna (1999).

The firm-related managers did not report this as a significant issue. Manager 1 recognised that the choice of services rather than software could act as a constraint to future growth, but the firm was taking steps to deal with it. However, if the firms had chosen a different technology-based sector, such as biotechnology with its long development cycles and potentially higher risk of failure, they might now report that

choice as a reason for their lack of revenue and commitment to high levels of investment. In fact, both software and services sub-sectors are fast growing, require little initial investment, and generate revenues relatively quickly<sup>17</sup>. The choice of sector, could, therefore, be said to be a key factor in their successful growth.

Even at the industry level, firms selecting “good” niches (PriceWaterhouseCoopers, 1998), and managing well within them, did not encounter the problems faced by, say, company 5. In particular, the choice of the services sub-sector reduced financial demands in the early stages of growth and avoided the need to develop a product before generating revenues. In fact, as mentioned earlier, product development problems with the windows version of its software was a fact contributing to the poor performance of company 5.

The importance of relationships, particularly in gaining access to technology, was recognised by most managers, mainly through their involvement in technology supplier partner programmes, something which company 5 had, reportedly, generally ignored.

This, then, presents a pro-active view of developmental approaches, emphasising the need to lay the foundations of sustained growth early in the life of the firm, and the need to recognise the future impact of decisions. Hughes (1998) examined differences in prospective and retrospective constraints reported by firms, finding that sustained growers were affected less by anticipated constraints and more by unexpected constraints. This suggests that the recognition of potential constraints ahead can actually reduce their impact. Perhaps, due to the development of appropriate capabilities, well managed firms do not experience potentially growth-limiting factors as constraints.

### **7.3 Resource-based theories**

Teece suggests that the key to success is the development of a range of capabilities which allow the firm to exploit opportunities and deal with challenges, and there is evidence of interviewed firms doing this, particularly companies 1, 2 and 6 (those with the highest rate of growth). Manager 4 on the other hand saw competencies residing in individuals and did not recognise significant additional capabilities at the firm level. The manager of company 3, whose growth trajectory may have been levelling off, appeared to recognise the value added by the firm, but its failure to emphasise the integration of its staff (who were mainly contractors) probably limited its ability to develop firm competencies to the full.

The emphasis on management and marketing skills that was prevalent in the overview interviews also appears to reflect the need to focus on the firm’s portfolio of skills and competencies.

The dynamic capabilities approach, then, fits well with the research findings and provides a positive perspective of firms as active agents preparing themselves for the challenges of the future. In this context many “constraints” could therefore be said to reflect the firms’ weaknesses rather than external factors.

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<sup>17</sup> Some parts of the industry, such as Internet Service Providers (IPOs) may require significant funding for promotion to achieve significant growth, but none of the firms interviewed were in this sub-sector. The fact simply emphasises the significance of sector/sub-sector selection.

#### 7.4 Further considerations

The failure to identify finance as a problem is more difficult to explain, but Penrose's description of the environment "*...as an 'image' in the entrepreneur's mind of the possibilities and restrictions with which he is confronted*" (1995, p.5) draws attention to an alternative perspective.

Almost all of the firms recognised the difficulties involved in obtaining external funding, as did the overview interviewees. Work by Latter and Garnsey (1995) has expanded on some of the reasons for this, focussing on the asymmetries which exist between entrepreneurs and venture capitalists. Risk aversion among investors is also a much-quoted factor.

It could be that the firms have deliberately adopted an organic growth path in order to avoid problems of obtaining external funding. This would be consistent with the findings of Hughes (1998) with respect to prospective evaluation of constraints. Having adopted an organic growth strategy, the firm's growth rate will depend upon its ability to generate revenues (as pointed out by manager 6). Objectives will have been set taking into account this factor, hence eliminating it as a "constraint". Company 2, with the most impressive growth path of all the firms (sales rising from 0 to £20m in 5 years) obtained external finance through an IPO in order to maintain its trajectory. Company 6, on the other hand, was reported to have been relatively ignorant of the US venture capital environment until it opened a US office.

Similarly, a firm's marketing performance will be taken into account when estimating future revenues, hence eliminating this factor as a "constraint", although manager 1 recognised that this could emerge as an issue as it grew beyond sales of £20m per annum.

The subjective nature of constraints and their impact on firm growth is further reinforced by consideration of the situation in the USA. Although the environment is generally regarded as more amenable to the development of technology-based firms, particularly with respect to venture capital, the problems reported by growing firms are remarkably similar. A study by Terpstra and Olson (1993) found a pattern of problems which emphasised management and other internal issues over the market and financial constraints, particularly among firms which had developed beyond the early stages of growth.

Despite this, US firms do appear to grow faster and larger than UK firms, with one of the key differences cited as a lack of managers capable of taking firms beyond the small scale (e.g. Jones, 1998), though the availability of finance cannot be ignored. The example of growth in the UK versus adequately funded growth in the USA quoted by one of the overview interviewees, gives further weight to this argument.

A self-limiting mechanism may operate even among some relatively successful UK firms in fast-growing industries, whereby the threshold of success is lowered to take into account structural problems in the UK market, and an inadequate skills base.

Summarising this, then, it might be said that:

1. The relevant operating environment is that which is perceived by the entrepreneur<sup>18</sup>.

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<sup>18</sup> The term "entrepreneur" is employed here to represent the person or persons responsible for the firm's strategy and its implementation.

Hence, the entrepreneur will only respond to a sub-set of the opportunities and constraints (possibilities and restrictions in Penrose's terms) actually present.

2. The entrepreneur will take into account environmental factors and his firm's capabilities when defining objectives.

The entrepreneur may identify development requirements, but she is likely to regard "external" or structural factors as given, and may not be prepared to commit to objectives which require substantial additional capabilities. There is therefore a self-limiting process.

3. The effective entrepreneur will act to deal with the constraints he perceives, either by the development of new or improved capabilities, or strategic manoeuvring.

Hence, where constraints are recognised in advance their impact will be reduced either by avoidance or positive action.

The simple model depicted in Figure 12 illustrates these points.

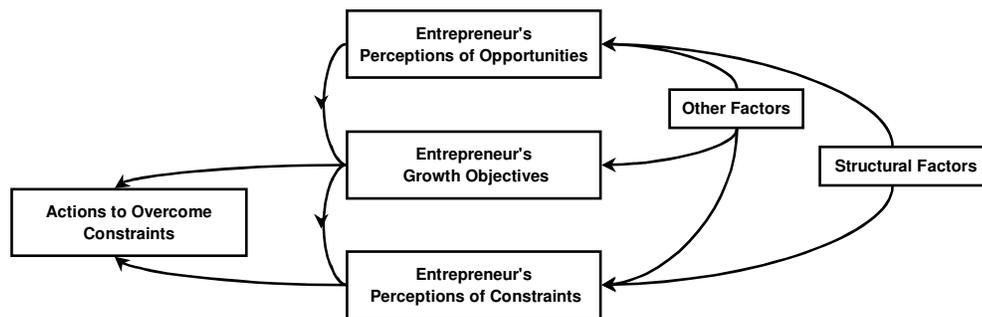


Figure 12 A model of constraints on growth

A parallel can be drawn between the opportunities and constraints identified in the model and the "possibilities and restrictions" referred to by Penrose (1995). "Structural factors" include such things as the availability of investment capital and, to some extent, the availability of human resources of the requisite quality. "Other factors" includes the education, capabilities, experience and motivation of the entrepreneur and her staff, the organisational competencies of the firm, and chance.

The entrepreneur's perceptions of opportunities will be based on his understanding of the environment, which in turn will depend upon the information available to him, the "other factors" referred to above (e.g. known competencies) and his understanding of relevant structural factors (Item 2).

The opportunities will form the basis of the growth objectives which will also be influenced by factors such as motivation and capabilities. Constraints will emerge from the perceived interaction of the structural and "other factors" and the growth objectives. In other words, factors will only constrain growth if they interfere with the objectives adopted by the entrepreneur.

Where constraints do emerge, action is initiated to address them, either by avoidance or by procuring the necessary resources or capabilities (Item 3). This process could operate as a feedback loop, with the entrepreneur re-assessing objectives, recognising new opportunities, or perceiving different constraints (either due to knowledge

gained from the first cycle, or through changes brought about by positive action). The feedback process has been omitted for the sake of clarity.

## 7.5 Exploring the model

In an ideal world with perfect information and with resources freely available in the market, the entrepreneur would address all restraining factors in an optimal manner, changing course to avoid those for which the cost of removal is greater than the benefits, and procuring the necessary capabilities to deal with those where it is not. It is important to recognise that neither avoidance nor the development of new capabilities is necessarily right or wrong, the appropriate response will depend upon the specific conditions of a given case.

The world is not perfect, nor is the entrepreneur. Item 1 states that the relevant environment is that perceived by the entrepreneur. Accordingly, if the entrepreneur's perception of opportunities and constraints is imperfect, the growth objectives will be less than optimal, as will be the actions implemented to deal with constraints.

The failure of the managers interviewed to report a wider range of constraints appears to result from three main sources. First, the firms may have recognised the potentially constraining factors and implemented actions to overcome them, there is some evidence of this in most of the companies (e.g. use of partnerships to ensure access to technology). Second, the entrepreneurs' perceptions of constraints or opportunities may be too limited. Finally, there may actually be no problem.

It is now possible to return to the question of the failure to identify finance as a constraint. The model proposes that the structural factor not only influences the perception of the constraint, but also affects the setting of objectives via the entrepreneur's perception of opportunities. Hence, the entrepreneur may have set a sub-optimal target having taken into account the unavailability of external finance. It may also be the case that finance may not be a constraint on firm growth, though this seems unlikely given the views of the experienced directors interviewed in the overview, and the fact that firm 2 has seen the need to seek external finance through an IPO to maintain its growth trajectory.

If entrepreneurial teams have already factored in environmental constraints and been influenced by these perceived "realities" in setting goals for the firm, they will not necessarily perceive or present them as constraints. Given more ambitious objectives, perhaps more firms would report a greater range of constraining factors, but would also appreciate more fully their own potential.

If this is to be achieved there are two main implications for both entrepreneurs and policy makers:

The expectations of entrepreneurs need to be surfaced and discussed, to ensure that they are aware of the range of opportunities available to them.

Education and training of entrepreneurs may have a part to play in this. A study by Stanworth and Gray in 1992 reported a very low level of management training among the managers of small firms, and a distinct reluctance to take advantage of that which was offered to them (usually because they were "too busy"). They also found evidence linking the low level of training with business problems. The low level of prior management experience among the interviewed firms and the high incidence of "management effectiveness" cited as a constraint in the overview interviews suggest that the situation had not improved significantly since 1992.

There needs to be a better understanding of what is actually being taken into account in the formulation of business objectives and strategies in order that the real nature

and impact of constraining factors can be established. If a factor is not widely reported as a constraint this cannot be taken to signify that it is not affecting performance. Managers and entrepreneurs need to be made more aware of their implicit assumptions and how they might be influencing their decision-making. Failure to address these “hidden” constraints could continue to prevent small firms in the UK from growing to their full potential and so generating the value of which they are capable.

## 8 CONCLUSIONS

A wide range of constraints was reported by the firms considered here. No distinctive patterns emerged strongly linking particular constraints to poor growth performance or specific firm attributes.

The most widely reported problem facing firms in this sector appears to be a shortage of good quality, skilled staff. After this, most factors relate to the management of firms, with some evidence from the interviews of the impact of good management systems and practices. The importance of flexibility and the building of organisational capabilities was evident, as was the importance of reputation among firms of all sizes.

The availability of investment funding was widely recognised as an issue, though it was not rated overall as a significant constraint. However, this may be due to many firms having adopted strategies based on self-funded organic growth. This and other findings suggest that structural defects and other industry factors could be constraining growth even among successful firms, through the setting of sub-optimal objectives based on strategies which make it unnecessary for firms to address potential constraining factors.

The neglect of subjective factors shaping the perception of constraints that affect small firm growth points to a weakness in the analysis of firm strategy and performance based on self-reported factors. Entrepreneurs, and others involved with the management of the firm, rely on their own interpretation and understanding of the enterprise and its environment. Both constraints and attributes are to some extent subjective, and the awareness, and therefore reporting, of them depends upon the individual’s own knowledge and understanding. The fact that a particular factor is not identified as either a constraint or an attribute does not mean that it has not affected the firm’s performance. Indeed, the most problematic constraints may be those of which the entrepreneur is unaware.

The answer to the problem highlighted by David Storey (1994)<sup>19</sup> may lie as much in improving managers’ awareness and understanding of the factors affecting growth as in action to remove structural defects in the economy.

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<sup>19</sup> “It is the failure of UK small enterprises to grow into large enterprises that may be at the heart of the country’s long-term poor economic performance” (Storey, 1994, p.159)

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## **Appendix 1 Interview Framework**

# Constraints on the Growth of Computer Software and Services Firms

## Interview Framework – Company-based Interviews

### Company Details

Employees, Sales and Profit for the last 5 years

Start up details and type of firm: Start Date; Sector (Software/services); Origin (MBO, MBI, Spin-out, New Start-up)

Founders (Individual, New Team, Existing team, Other);

Capital Structure and sources of funding and (Founders, Business Angel, Venture Capital, Debt)

### Management Team

Who holds the key management positions? (Founders; external recruits; promoted staff)

What was the management team's experience prior to joining this firm?

- In the industry/sector
- In management

How have the management structure and procedures of the company changed over time? How have the roles of the founders/senior managers changed?

To what extent have external advisors assisted the company's development?

### Strategy

What is the company's strategy and objectives, particularly in terms of turnover and growth?

To what extent has the strategy changed since start-up? Have changes been associated with crises, decision points or deliberate changes in direction? How realistic or challenging were the original objectives? To what extent have early decisions affected firm strategy in the long run? Is there a clear exit strategy?

What is the company's customer base?

What is the nature and scale of the firm's international business?

### Competitive Advantages

What are the firm's main competitive advantages? [Ask open question first, then prompt to check relevance of items identified elsewhere:]

**Firm Attributes:** Marketing/promotional skills; Speed of service; Established reputation; Cost advantages; Flair and creativity; Personal attention/responsiveness to customers;

**Deliverable:** Price; Product or service design; Product or service innovation; Product or service quality; Specialised expertise/product/services; Range of expertise/product/services

**What (if any) company-specific skills/problem solving strategies have evolved over time?**

### Constraints

What are the constraints on your firm's growth? [Ask open question first, then prompt to check relevance of items identified elsewhere:]

**Resources:** Availability and cost of finance for expansion; Shortage of skilled labour; Shortage of experienced management staff; Management effectiveness; Marketing and sales effectiveness

**Technology:** Difficulties in acquisition of technology; Difficulties in implementing new technology

**Support:** Availability of premises or site; Availability of knowledgeable professional advisors

**Market:** Access to customers; Access to overseas markets; Overall growth of market demand; Increasing competition; Strength of large competitors; Lack of credibility with customers

**History:** Strategic decisions made early in the firm's life